News of Northwest Control-Line Model Aviation

Flying Lines

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

Think regionally, act locally

Why do we have Northwest rules? Why not just let contest organizers do whatever they want when it comes to events not in the AMA rulebook, such as our various homegrown racing and combat events? Why argue about the proper way to conduct Nostalgia Diesel Combat, for example?

There are good reasons to hash this stuff out. It all goes to the general health of the control-line model aviation hobby across the region, not just in our own back yards.

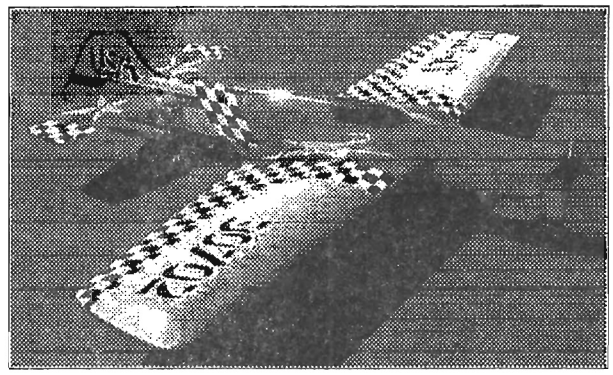
It has been sort of an unofficial motto of *Flying Lines* since it began in 1979 to promote a region-wide view of our competitive activities. The thinking is that if people in Seattle are flying by the same rules as people in Eugene, or Boise, or Vancouver (either one), then when one of the clubs holds a contest, people can come from all over to participate, and there will be no question about the rules and procedures. And there won't be anyone saying, "Well, I'd go to the contest but my plane isn't legal in that club's rules." What's legal in Roseburg is legal in Richland.

It's the same philosophy that drives the Regionals, as a sort of annual convention for all of us from all over to gather in common interests; and it drives *Flying Lines*, an effort to keep communication going between all of our remote locales (and keep the rules coordinated, no small task); and it drives *FL's* Northwest standings and records, etc.

Obviously, varying locations and clubs will have varying interests and there will be events in which they want to do their own thing. More power to them. The more flying, the better! But we're all best served when clubs and contest organizers in all locations participate in the rules-making process that comes up once in a while via *FL*, and uses the rules as promulgated. (They were published in Issue 179, by the way).

And beyond rules, everyone is best served when we all, when organizing contests, thinking up new events, etc., consider the impact beyond our local flying field. For example, if we're thinking of creating a "new" event, would it enhance the region's activity in that category or rob participants from an existing event, spreading our activity even thinner?

Tough questions. But they can be answered if we all "act locally, think regionally."



There are few fliers or planes who have an the impact on control-line model aviation equaling that f of Paul Walker and his Impact, seen above at last year's Northwest Regionals in Roseburg. Getting a chance to watch Paul fly aerobatics is one of the many reasons to anticipate a trip to the Regionals. ***Heman Lee photo.***

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Round & Round

The Control-Line modeler at large

By John Thompson

Modeling thought for the month:

"The foolish and the dead alone never change their opinions."

— Lowell

On the other hand ...

One of the great things about our hobby is that, when a group of modelers gets behind an idea that they really like, they will work tirelessly to make it a success. One of the herculean efforts along these lines is that of Mel Lyne and a cast of associates who have worked to make Nostalgia Diesel Combat catch on as a beginner/slow combat event.

It's an event that has generated a lot of discussion as well as to what the rules should be, and Mel and his crew have fought hard to keep it nostalgia, retro, slow and easy.

Some, including me, have argued that having it be so retro and so tightly restricted actually has worked against the event's growth. There has been quite a bit of discussion via e-mail, etc.

A great thing about the free exchange of ideas is that all of us involved have an opportunity to learn something from it if we are participating with open minds. My own opinion has come almost full circle on the issue of dBat rules, which I view academically since I don't fly the event.

My initial thinking had been that dBat would attract more interest regionwide if the rules were simplified and many of the restrictions removed.

I reasoned that some of the things put into the rules to make dBat easy actually make it hard and less attractive to many fliers. I thought the requirement for old-timey airplanes that eschew modern construction techniques and fly like wobbly old tubs turned people off. I figured that very few contemporary fliers really have any nostalgia for 1960s English diesel combat planes.

So, I suggested, why not drop the "nostalgia" part of it, drop the airplane and engine restrictions (other than the .15 diesel requirement), and simply let the speed limit be the regulating factor? What I envisioned was a combat event that would still entail long, slow, entertaining matches, but would be open to modern airplanes and engines limited only in speed. I figured that that would make the event more accessible by making it less difficult to find the allowable equipment (you could buy the planes off the shelf!), and the combat would actually be better because the planes would fly well even at the slow speeds. And the rules would be so much simpler!

Mel made a great many eloquent arguments about why the event absolutely must retain its retro style, most of which probably make perfect sense, even if *I* don't get it. However, somewhere along the line one fact did sink in to my thick skull: The simplified event that I envision would basically be a diesel clone of 80mph combat.

Since 80mph combat is our most popular combat event, I'd hate to create anything that would dilute participation in that excellent event. And keeping the old-timey flavor of dBat actually makes it different enough to be worth while for those it interests, rather than "just another event." It's the same thing that made Clown Race catch on — it was enough different from other racing events that it was not "just another event."

So, Mel has convinced me that there's wisdom in keeping the uniqueness of dBat. Not everyone is convinced, yet. While Mel and I were batting ideas back and forth, Mark Hansen's Cognitive Modeler column came in (see it elsewhere in this issue) offering another perspective. Mark mentions a few things I had not thought of. I can see good points on both sides of the question.

So I end up comfortable with dBat as an alternative combat event with its own unique appeal and its dedicated followers — though I do suggest that the one-prop rule be revised since that one prop can't be bought.

And, hey, if somebody can show me a design among the 1,000 or so legal ones that actually doesn't fly like a wobbly old tub, I might even jump in and fly a few matches myself!

I come away from these discussions always with the one strong impression that our hobby brings out the best in people: The passion to improve, to promote, to campaign for the type of model flying we love, and ultimately to join in the good fellowship of flying and friendly competition. We have our differences, but we all agree in the end that CL flying is the best hobby there is.

Send comments, questions and topics for discussion to John Thompson, 2456 Quince St., Eugene, OR 97404. E-mail JohnT4051@aol.com. World Wide Web: http://members.aol.com/JohnT4051/ NorthwestCL.html.

Where the action is!

Coming events in Northwest Control-Line model aviation

April 20-21

Fourth annual **Jim Walker Memorial CL Fun Fly.** Site: Delta Park, Portland, Ore. Saturday: Old Time Stunt; Classic Stunt; .15, Profile, Class I, Class II and Golden Age Carrier. Sunday: Precision Aerobatics, 80mph Combat. For info, contact Scott Riese, (503) 246-8867, SRiese5283@aol.com

May 4-5

Big Money Nostalgia Diesel Combat Contest, Arlington, Wash. Site: Take Exit #206 Smokey Point from Interstate 5 and go East 1 mile on 172nd St. Turn left on 51st Ave at the light and the site is on the left. Park on the grass. Standard Northwest Nostalgia Diesel Combat Rules. Five rounds plus finals. $20 entry. $1,000 prize money. Camping and motels close by. Contact Mel Lyne, e-mail: mlyne@sea-to-sky.net Telephone: (604) 898-5581.

May 5

PAC Carrier/Racing meet for all classes of Navy Carrier and .15 Nostalgia Race. Rice Mill Road site, Richmond, B.C. Contest starts at 10 a.m. Info: Contact Chris Cox at (604) 596-7635, ccox1@telus.net.

May 24-25-26

Northwest Control-Line Regionals, Albany Municipal Airport, Albany, Ore. Aerobatics: 4 PAMPA classes, OTS, Classic. Combat: Vintage Diesel, 80mph, 1/2-A, all triple elimination. Navy Carrier: .15., Profile, Class I, Class II. Racing: Mouse I (J-S)(O), Mouse II, Rat, Slow Rat, Goodyear, NW Goodyear, NW Sport (J-S)(O), NW Super Sport, Flying Clown, Quickie Rat. Scale: Precision, sport, profile. Speed: 1/2-A, 1/2-A Proto, A, B, D, FAI, Jet, Formula 40, .21 Sport, .21 Proto, NW Sport Jet. For info, contact *Flying Lines* or Contest Director Craig Bartlett, (541) 745-2025 or e-mail scraigbart@yahoo.com

June 29-30

Bladder Grabber triple-elimination AMA fast combat tournament, Harvey Field, Snohomish, Wash. For info contact Jeff Rein at Jeffrey.Rein@PSS.Boeing.com.

July 6

Lucky Hand Fun Fly, Bill Riegel Field, Salem, Ore. Fly any plane or planes you want, any way you want. Every flight gets a playing card. Best poker hand wins a prize. Contest Director Mike Hazel, (503) 364-8593 or ZZCLSpeed@aol.com

July 21

Central Oregon Lawn Darts Third Annual stunt contest, Field of Dreams, Redmond, Ore. Precision Aerobatics. For info, contact Nils Norling, 281 7th St., Metolius, OR 97741, or e-mail hogrider@crestviewcable.com

July 27

PAC Classic for Northwest Sport Race, Clown Race and Carrier. Rice Mill road site, Richmond, B.C. Contest starts at 9 a.m. Contest Director: Keith Varley, (604) 327-4932.

July 28

Western Canadian Stunt Championships for Old-Time Stunt and four PAMPA classes of precision aerobatics. Rice Mill road site, Richmond, B.C. Contest Director: Chris Cox, (604) 596-7635, ccox1@telus.net.

Aug. 3-4

VGMC Can-Am Speed Champs, Upper Coquitlam River Park, Coquitlam, B.C. For info, contact Paul Gibeault, pgibeault@telus.net

Aug. 24-25

WOLF Summer Meet, Bill Riegel Field, Salem, Ore. Saturday: Northwest Sport Race, Clown Race, Quickie Rat, Classic Stunt, P40 Stunt. Sunday: PAMPA Stunt, 80mph combat. Contest Director Mike Hazel, (503) 364-8593 or ZZCLSpeed@aol.com

Sept. 21-22

Oregon CL Speed Championships, Bill Riegel Field, Salem, Ore. Contest Director Mike Hazel, (503) 364-8593 or ZZCLSpeed@aol.com

Oct. 5

Nostalgia Diesel Combat, Arlington,Wash. Site: Take Exit #206 Smokey Point from Interstate 5 and go East 1 mile on 172nd St. Turn left on 51st Ave at the light and the site is on the left. Park on the grass. Standard Northwest Nostalgia Diesel Combat Rules. Five rounds plus finals. Contact Mel Lyne, e-mail: mlyne@sea-to-sky.net Telephone: (604) 898-5581.

Oct. 12-13

Fall Follies, Bill Riegel Field, Salem, Ore. Racing, Precision Aerobatics, possibly something else. Details TBA. For info contact *Flying Lines*.

Your contest date, 2002 ???

It's not too early to get your 2002 contests listed in the "Where the Action Is" calendar. Send the information to *Flying Lines*.

The Flying Flea Market

Classified advertisements — FREE for *FL* subscribers

FOR SALE: Cyclon Top 3 engine, $130. (New price is $165.) This one has about 3 minutes of running time. E-mail Tom Strom at TStrom@aol.com.

SALE - SALE - SALE - SALE - SALE - SALE: All Brodak dope — 25% off. All Bob Smith CAs and Epoxies — 25% off. All brands, all sizes propellers — 25% off. Eugene Toy & Hobby, (541) 344-2117, www.eugenetoyandhobby.com.

BRODAK KITS FOR SALE: Pathfinder list $80, now $64; Cardinal list $80, now $64; Oriental list $76, now $60. Please add $6 S&H. J & J Sales, P.O. Box 99, Waitsburg,WA 99361. Phone (509) 337-6489. E-mail ukeyman@altavista.net

FOR SALE: Harter's 1/2-A Peanut speed kit. $60. Mike Hazel, (503) 364-8593.

FOR SALE: 2 Ea. Nelson 15 ABC FIRE, Exc., just back from Henry Nelson (new bearings, etc.) Used for FF and combat, U.S. $135 or both for $260; 1 Ea. Nelson 15 ABC FIRE longstack, C/W spinner, exc., low time used for GY, U.S. $130; 1 Ea. NIB Irvine .15 MK 2 GY/FF Version, P/L chromed & fitted by Dye, fitted Nelson head, large venturi & pressure backplate, U.S. $150; 1 Ea. NIB Irvine .15 MK 2 or speed, C/W spinner, P/L chromed and fitted by Dye, 4.9mm pipe stinger, U.S. $185; also many excellent Irvine .15 parts for sale: heads, shims, spinners, P/L, venturis. Write for details & prices. 1 Ea original version Cyclon .15S FAI piped speed engine, Mint cond. in orig. handmade wood box W/ plexiglass top, C/W factory pan, prop, spinner, shutoff, tank & spare parts, also C/W Doc package for collectors, U.S. $200; 1 ea. NIB Russian Cyclon .40 ABC pylon (RIRE) C/W, gorgeous 2-1/4-inch spinner, minipipe, head wrench, U.S. $275. Paul Gibeault, 54-5380 Smith Drive, Richmond, B.C. Canada V6V 2K8, phone (604) 526 3386.

WANTED: K&B 4.9 engines and parts. Also early version of Veco Tom Tom kit. Craig Bartlett, (541) 745-2025.

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: Shareen Fancher, 158 Flying Cloud Isle, Foster City, CA 94404.

FOR SALE: Vintage original model airplane plans circa: 30's to 70's. Rubber-FF-UC-RC-CO2-Jetex. Send #10 SASE for list to: Jerry Campbell, 2355 SE 43rd, Portland, OR 97215-3713, phone 503-233-2194.

WANTED: Fox .35X and .36X parts. Also SuperTigre .35 parts. Chuck Matheny, (360) 659-0155.

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 clflyer@tbcnet.com.

RACING INTEREST GROUP: National Control Line Racing Association offers newsletter with technical articles, organizes national events, keeps national standings and more. Contact NCLRA, c/o Dave McDonald, P.O. Box 384, Daleville, IN 47334. Online: http://members.aol.com/DMcD143

HELP WANTED: Northwest Regionals 2002 field setup, registration, event judges, general assistance before, during and after the contest. Contact the *FL* editor to volunteer.

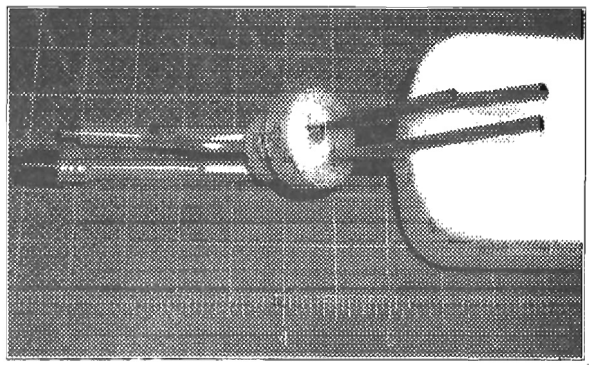
YOUR AD HERE: Remember, classified ads are free to *Flying Lines* subscribers. Send yours in today for publication in the next edition.

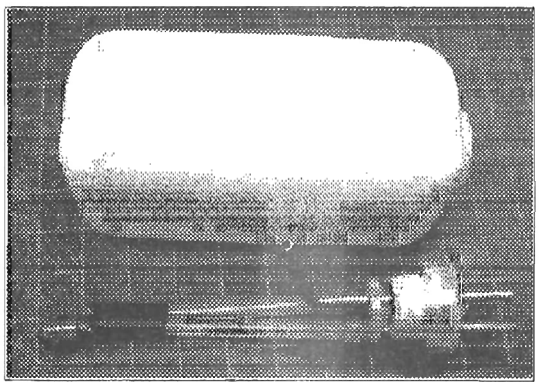
Regionals trophy sponsorship deadline April 15

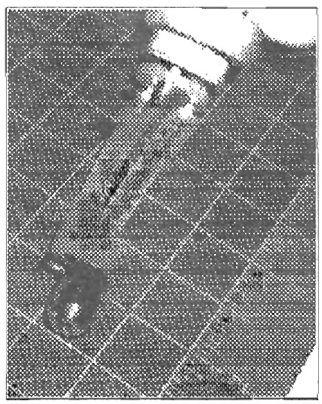
The trophy sponsorship forms that went out with the Regionals flyers did not mention a deadline. If you plan to sponsor a Regionals trophy, please make your commitment by April 15, in order to allow lead time for engraving. You can contact trophy coordinator Mike Hazel by phone, (503) 364-8593, or e-mail, ZZCLSpeed@aol.com, right up to the deadline.

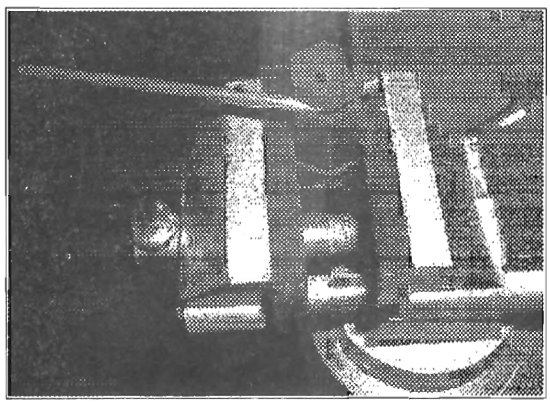
Plastic Uniflow Tank Pictorial

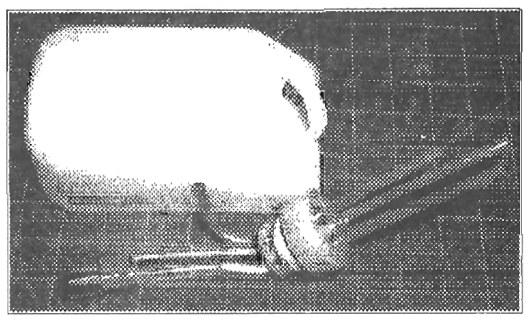
Nils Norling says the winter weather in Central Oregon has kept him from flying, so instead he has been working on an instructional pictorial on construction of uniflow plastic tanks. Just follow down the column and you will see each step in the process!

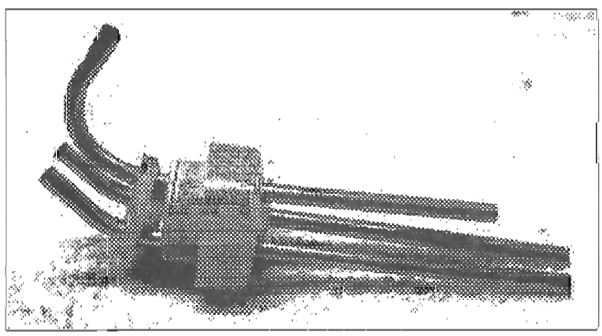


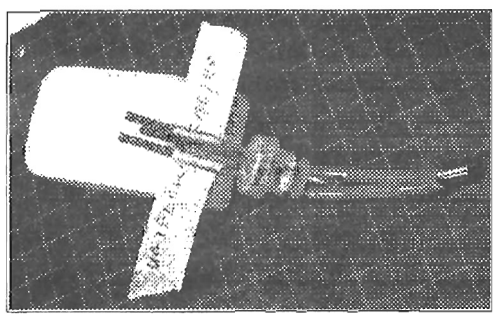


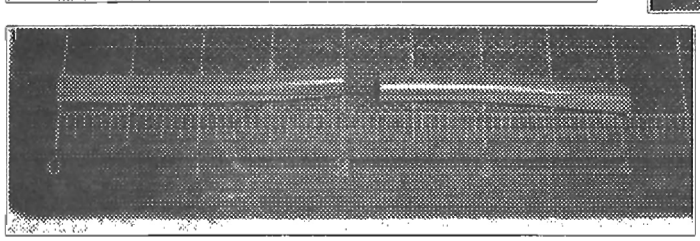












Thanks to Nils for this informative photo layout. *Flying Lines* welcomes technical tips and articles, large or small, with photos or without!

Unsung heroes

Recognizing people who make special contributions to our hobby

Carl Wheeley: A *Model Aviation* giant

(EDITOR'S NOTE: Some of our fellow modelers, while not necessarily CL fliers, make a contribution to our hobby far beyond what we might realize. Carl Wheeley was one of those. Here is some information about one of the hobby's heroes supplied by the Academy of Model Aeronautics.)

MUNCIE, Ind., March 27, 2002 — Carl R. Wheeley, publisher of *Model Aviation* 1975-1990, died on March 15. He was 72.

A resident of Lusby Md., Carl was instrumental in starting *Model Aviation* in its current form, following the bankruptcy of *American Aircraft Modeler*. Previously, *Model Aviation* had been a section within the *AAM* publication.

Launching a color, monthly magazine proved to be an enormous undertaking, but under Carl's leadership the fledgling publication built a stable of quality writers and found advertisers willing to invest in AMA's largest and most significant publishing effort up until that time.

Carl's employment with AMA began much earlier, though. Fresh out of high school, Carl was hired as a clerk-typist in 1947. Carl then became responsible for assembling *Model Aviation*, which at that time was an eight-page pamphlet available by subscription for 50 cents a year. Later, Carl became AMA's Technical Director.

In a letter dated Feb. 14, 2002 to AMA Historian Norm Rosenstock, Carl reflected on some of AMA's early days:

"Those were the days when member records were on 3x5 cards which had to be filed by hand. AMA license cards (one a Gas Model License, the other a Rubber Model License) had to be typed, as did the file cards and a label to mail the member credentials kit."

Carl resigned from AMA in 1960 to pursue work with another modeler in the field of architectural illustrations. During this time, Carl's involvement with the AMA continued in the form of elected service. He served as AMA District IV Vice President, and then as secretary-treasurer (now known as Executive Vice President).

He returned to full-time employment with AMA roughly 10 years later, working on the *Model Aviation* section of *AAM*, the Competitions Regulations (rule book) and various other publications distributed by the Academy before launching *Model Aviation* magazine in 1975.

Wheeley assembled a top-notch staff for the magazine, including Bill Winter as editor and Frank Ehling as advertising manager. When Winter retired in 1980, Wheeley's title became editor and publisher.

"I take pride in the fact *Model Aviation* never lost any money during my tenure. Actually, the surpluses *MA* had each year, which went into general AMA funds, probably helped stave off AMA dues increases," Carl wrote in February.

Following his retirement in 1990, Carl periodically worked with AMA on various projects, and edited the "Modeler's Mall" section of *Model Aviation* for several years.

"Carl Wheeley was one of the best employees who ever worked for me when I was AMA's Executive Director. His competence was incredible, almost never requiring direction or assistance — he always knew what to do, how to do it, and had a dedication to producing *Model Aviation* magazine that knew no bounds in regard to hours needed to do the job right," noted John Worth, former AMA president and Executive Director.

Carl was a recipient of the prestigious Fellowship award, the highest honor AMA can bestow on an individual. He was a Life Member, a Contest Director and a Leader Member.

"Carl was one of the most interesting men I have ever met," said AMA Executive Director Joyce Hager. "He was so full of knowledge about the organization and modeling. Whenever you didn't have the answer, you need only talk with Carl."

Carl was a lifelong modeler with a special

affection for Free Flight, participating in competitions for many years. His crowning achievement was winning the individual Fédération Aéronautique Internationale World Championship for Free Flight power models (now called F1C) in 1954.

"In my last year before my retirement it was a particular pleasure to have his 1954 World Championship power model hanging over my desk at AMA," Worth said. "I had talked him into bringing it from home so that I and others could admire this great example of his achievement on the international scene."

Carl is survived by his wife, Susanne Parran Wheeley, one daughter, Ann R. Wheeley, one son, Scott P. Wheeley and one grandson, Benjamin P. Wheeley. Memorial contributions may be made to the AMA at 5161 E. Memorial Dr., Muncie, IN 47302, or Calvert Hospice, 238 Merrimac Court, Box 838, Prince Frederick, MD 20678.

Carl was born in Durham, NC. He lived with his parents in Washington D.C. during World War II while his father was a machinist for the Navy Yard and his mother managed a boarding house. He attended Powell Junior High and Central High School in Washington, D.C., and graduated from Mineral Springs High School in Winston-Salem, NC.

"Unsung Heroes" is a new Flying Lines *feature, intended to provide recognition to people in model aviation who make a special contribution to the success of our hobby.* FL *readers are encouraged to send in articles and information on people deserving of notice in this column.*

Work hardening and failure analysis

By Buzz Wilson

Jim Cameron's article in the November-December issue on his control system experiences got me to thinking about how an incomplete analysis of a failure can result in the spreading of incorrect information.

Jim was discussing .027", seven-strand cable, which in his opinion should not be used in an application that bends it in a tight radius. Jim's Lesson learned: Don't use .027 in. cable for lead-outs. I have used .027" seven-strand cable for years without a single failure. Maybe I am just lucky and my luck is about to run out. I have had failures of .018 when I used it on metal bellcranks for 1/2-A's. Jim makes a good point about using a sleeve through the bellcrank, which I do on all my stunt planes.

What I want to convey in this diatribe is that regardless of the failure, analyze it before jumping (don't be a Lemming) to a conclusion — don't confuse the issues with facts. I will do this through a series of examples as well as some basic materials analysis. For those of you looking for additional information, a good book is "Elementary Science of Metals" by J. W. Martin.

On Dec. 23, Jeff Rein and I were flying FAI combat. On three consecutive occasions Jeff had a fuel filter fail. Each failure of the 30-cent part cost Jeff a $4 prop. What was causing the filter to fail? Should he never use them again? First of all, these are old filters with many flights. Secondly, they are pressed together. Thirdly, on a combat plane there are large forces at play, which induce lots of vibrations, of which I do not have a clue as to what the frequency might be. I do know Jeff's filters have been used on fast, 1/2A as well as FAI airplanes. Fourthly, these filters see the pressure from the bladder when the fuel line is pinched. So what caused the filter to fail? Most likely the vibrations and pressure loosened the joint causing it to pull apart in flight. Why three in a row? They typically package them three to a pack. Did Jeff reach the life on the entire pack? What is the solution? Recognize that these filters are disposable and do not use filters with a lot of cycles on them in a critical situation.

As modelers one of our biggest nemeses is **work hardening.** Work hardening is a "silent" kind of shop problem. No one talks about it much and no one can easily define it, but it can affect almost every job. So, what is work hardening? Technically, work hardening is a restructuring of the part material on a molecular level. When heated to a specific range, for a specific length of time, the molecules of the material rearrange themselves to form a new, harder material. You say this sound a lot like heat treatment of metals; well you are right. The same process that heat treats metal is also the process that causes work hardening, but on a smaller scale. When a material is subjected to an increasing tensile stress the material extends elastically. Unload it and it returns to its original state. At stresses above the this limit of proportionality, the material is no

longer elastic but plastic. As the materials elongates plastically, the stress required continues to increase and the material is said to work harden or strain harden. For the most part, the failure is a form of ductile fracture. After an initial elastic strain the material plastically elongates because of work hardening. As the material extends further, the strain becomes localized and a constriction or neck forms. The neck deepens progressively as the material is deformed until the material fractures. The material in the neck continues to work harden but the reduction in the cross-sectional area leads to a gradual fall in the load it will support and ultimately to failure.

A few years ago, someone got the idea to go with external controls on combat planes and hook the control lines direct to the bellcrank. Now granted, most lines used in combat do not have a long lifespan. After going to the 1999 FAI Team trials, I got interested in FAI combat and decided to build some practice planes. I ordered leading edges from Mejzlik, and proceeded to develop the Buzzoff practice plane. It started life with an external control system and direct-hook lines to the bellcrank. After all, it works for fast and the lines are .015". I made up a set of .015 lines and went out to practice fly. After each flight, I would inspect the engine mounts and control system, paying special attention to the direct hook, specifically looking for broken strands of wire. On the fifth flight, the autopilot took over the plane and it began to do consecutive inside loops. I did not remember installing a loop generator in the secret black box that I was also testing. I began to back up in an attempt to save the plane and was able to successfully pancake it. When I examined the controls that had no problems at the end of the fourth flight, the up line was broken at the ferrule. Since the down line was still attached, I decided to flex it. Well, three small cycles and it failed in the same location as the up line. What was the problem? Work hardening of the lines at the ferrule. I subsequently replaced the direct-hook buttons with music wire and put up over 100 flights using the same lines that had failed at the ferrule.

When work hardening occurs, the affected area will appear to be shiny and slippery. Although the surface will appear glazed, it is not flat. The material will have a hard, uneven surface, like a fragmented sheet of ice. This area will be very hard and difficult to machine. How is a part heated to such temperatures that will allow for work hardening? Metal cutting requires great forces and the action of a tool meeting the material is not always smooth. Friction between the tool and the part is the greatest source of heat on the part and this heat causes work hardening. Now, work hardening is not limited to bending. Drill a hole in metal and the hole is work hardened. Use a cutoff wheel and cut a piece of music wire and the area adjacent to the cut is work hardened. In everyday terms, work hardening is caused by dull tools rubbing against the material. There are a number of tips to help you avoid work hardening. Use sharp tools. Sharp cutting edges will cut the material, not rub. Use coolant. Coolant will keep the temperature of the cutting action down. Coolant should be used where possible, as work hardening will not occur without high temperatures

Although not all metals are subject to work hardening, most stainless steels, carbon alloys, and superalloys readily work harden. Be aware that certain machining processes will strain the material and tool increasing the chances of work hardening. A typical situation where work hardening causes problems is tap breakage. When the tap will not cut and breaks in a drilled hole, often the culprit is work hardening caused by the drill and not the tap at all. The drill overheats in the hole and causes work hardening inside of the hole. Parts that can be created in one operation will be much less likely to experience work hardening. Work hardening not only affects the part, but the tooling as well. It is a cyclic condition: Dull tools cause work hardening and work hardening dulls the cutting tool. The key to avoiding work hardening is maintaining your tools and always being aware that the materials most of us work with are likely to work harden.

Expanding on Jim's theme, those of you that use Mejzlik handles should pay close attention to where the wire exits the handle. Mejzlik uses a soft wire and where the wire exists the plastic handle can create a sharp edge for the wire to work against and ultimately fail. Both Jeff and I have had this problem. There are at two ways to fix the problem. Carefully relieve the hole to eliminate the sharp edge. The second solution is to get a big hammer and smash the heck out of the handle being careful not to damage the adjusting mechanism. Now you can build your own adjustable handle. The next time you see me flying, ask

to see my new adjustable Aldrich/Mejzlik handle.

Year before last, Mejzlik began producing a shutoff that we all thought would be foolproof. Yet the Bladder Grabber they were not shutting the engines down during a flyaway. Jeff went home and began to experiment and I took his information and looked at the forces involved. The conclusion was that the wire being provided with the Mejzlik shutoffs was inadequate. Mejzlik took this information and upgraded the shutoffs.

Ever watch a good combat midair that looked like an explosion of covering? I especially like to see red Monokote floating down against a clear blue sky. Some of the most memorable involved Bob Carver in a great match that ended in a midair. So what do you need to do to get this effect? Lots of heat, get that covering good and tight. Oh by the way, that extra heat just changed the material at a molecular level causing it to become brittle. A brittle crystal subjected to a tensile force (you just heated the heck out of the Monokote to pull it tight) pulls the cleavage planes apart and the interatomic bonds are stretched and they accumulate energy. When the midair occurs, the stored energy reappears as the surface energy of the two cleaved fracture faces. Lots of small pieces floating in the summer breeze.

Typically you see a reminder printed somewhere this time of year to get your equipment ready for the upcoming flying season. Here are a few things that I do so I don't have to analyze a failure.

1. Check pit box wiring for possible corrosion.
2. Check pit box wiring for possible strain on wires.
3. Replace batteries with a new set.
4. Check glow plug clip and wiring at the exit from the clip. Typically this is a failure point because of inadequate strain relief on the wire. Try to minimize the bend and support it with a silicon rubber.
5. Clean the filter and replace all the tubing used in the fuel bottle.
6. Make up new bladders. Take the old one and cut the end of the fuel line back to eliminate tube splits.
7. Inspect shutoffs and replace repair.

Eastern Washington News

By Joe Just

The take on control-line flying here in Eastern Washington may be improving after a bit of a layoff recently.

With the demise of the Columbia Basin Balsa Bashers it looked a bit bleak around here, but now there are a few control-liners popping up out of the woodwork.

In the past year I have met four or five new flyers and have actually gotten out a few times with a couple of them to fly. Right now, after spending several hours with Mac Ryan and talking with others, it may be that sometime in the coming Summer we may try to get a "fun fly" day set up to see just what kind of interest there is around this area.

This get together will more than likely be in the Tri Cities where we still have access to acres of really great paved areas, or in one of the grass areas in either the Tri Cities or here in the Walla Walla area.

One thing I keep hearing is that structured contests like we had in the past are not a top priority idea. There are several of us that feel that that was the cause of the Bashers fading away.

There is also some interest developing for attending a few contests on the wet side, and particularly in the Bend, Ore., site. I mean, how many times could you ignore the chance to eat a Cougar?

AIR MAIL

LETTERS FROM FL READERS

Dear Flying Lines:

My new combat plane flies so good it keeps cutting its own streamer. What should I do?

— Ratso Magoo

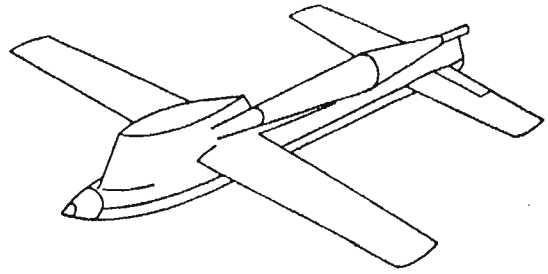
Ratso, this is an easy problem to solve. Next time you fly in a contest, just trade airplanes with your opponent. — Editor

Dear Flying Lines:

Why don't more readers write letters to the editor? Your comments on CL flying are welcomed!

— Lonely FL editor

THE NORTHWEST SPEED FLYER



A newsletter published every now and then, promoting control line speed activity in the Northwest district of the NORTH AMERICAN SPEED SOCIETY.

Ye Olde Editor: Mike Hazel, 1073 Windemere Drive NW, Salem, Oregon 97304

Greetings, Speedsters! The biggest speed news as of late would be the reorganization of the North American Speed Society (NASS). Chris Sackett has been the editor of the NASS newsletter (Speed Times) for two decades, and was the driving force in getting the organization started. Now he can take a breather, as some speedsters are taking the reins. Many thanks for his dedicated service.

The organization's new address is: NASS, Po Box 371, Fenton, MI 48430-0371. Dues for those in USA and Canada are $25 per year.

New records established last year in 'B' and 'Jet' have caused the wire sizes to go up in those classes. 'B' wire goes from .024 to .026, and the 'Jet' size went from .031 to .033. Make sure you get your orders in to your favorite wire supplier and get updated as needed. Ned Morris in Indianapolis carries all of the sizes we use.

Rules Cycle: As many of you know, the year 2002 starts a new 3 year rules cycle. Sure would be nice if the rulebooks were printed on schedule, still haven't seen one yet! Any new rules that we want to start the year 2005 cycle need to be proposed this year. The procedures and schedule for all of this have been published several times in Model Aviation magazine, so we won't repeat that here. Just remember that action needs to be taken soon, and will be handled with the newly-formed CL Speed Contest Board.

Contest Schedule: So far looks like we have the same three NW Speed meets as we did last year: The NW Regionals on Memorial Day weekend, the Can-AM meet in B.C. on August 3/4, and the Oregon CL Speed meet in Salem on Sept 21/22. Looks like this writer will get to all of them this year. Sure wish we could get a Speed meet back in the Tacoma-Seattle area again.....guys?

For those wishing to do some traveling, check out the calendar in Speed Times newsletter. There are traditional meets held in Southern California. Just a bit closer is Merced, California. C.D. Frank Hunt will have a meet during the last part of June, and on Labor Day weekend. Contact Frank for details.

With the flying season coming upon us, remember to shake down your equipment before coming to the first contest of the year. Many fliers don't have an opportunity to put up their planes before a contest, owing to the scarcity of good flying sites. However, don't let that stop you from doing a "shop shake-down".

Pull your plane(s) down from the wall and do a thorough inspection. Get any repairs you were putting off down now. Pay real close attention to the control system, engine mounting, and aircraft assembly hardware. Make sure the fuel system is in good shape, check the tank, install fresh fuel lines.

Don't forget the ground equipment, fueling syringes, battery leads and connectors, pitbox stocked, etc. etc. And of course check those flying wires and handles. Fly safe! .....Mike Hazel.....

pictured below is Chris "Partner" Sackett, prepping FAI ship. Maybe he will have more time for this now, eh?

The Real Thing

Scale building and flying, by Fred Cronenwett

Formation Flying

Now this is a real challenge — how close do you get?

Since the people I fly with all have throttle control we normally fly together in the circle together. But instead of just passing we use our throttle control to fly in formation.

We have flown models within 2 feet of each other at 40 mph. But to do this we need models that are equally matched in size and speed.

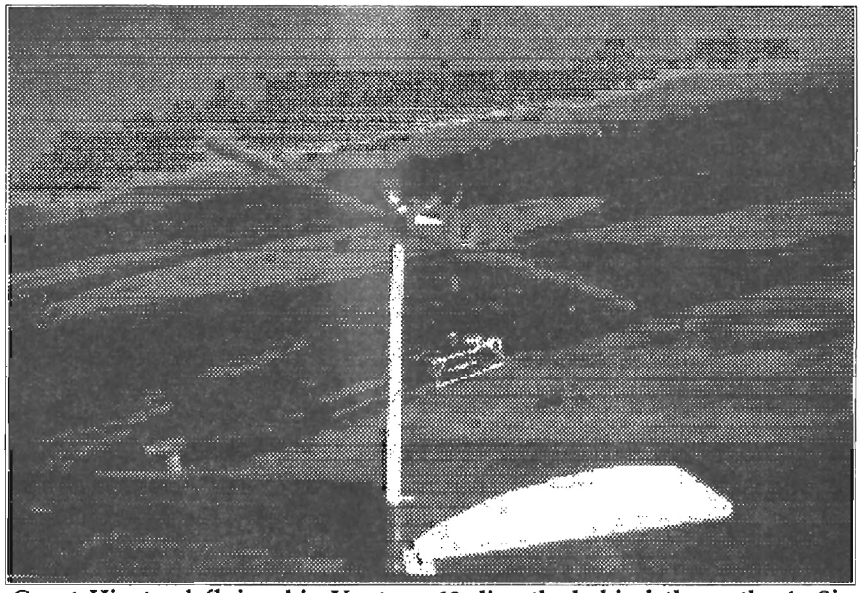
The line length does not have be the same, but radically different line lengths can be problem.

The cruise speed of the models should be very close to each other. In other words, flying a 90-mph carrier model in formation with a Piper cub that only flies at 50 mph is not practical. The throttle control systems must be precise enough so that small changes can be made to the throttle setting during the flight.

Once you have selected two models that are equally matched in flying speed one pilot should decide to fly lead. The lead model will be placed 1/8 to 1/4 lap ahead of the chase model and both model engines shall be started.

Once both engines are idling the models are released at the same time and the lead model sets the pace for the takeoff roll. The chase model must know where the lead model is so he or she does not overtake the lead model during takeoff.

Once the models are at cruising speed the lead model should set the throttle and not change it. This will allow the chase model to carefully adjust it's throttle setting to form up on the lead models tail. The chase model pilot will be making constant changes to the throttle setting to stay on the tail of the lead model.



Grant Hiestand flying his Venture 60 directly behind the author's Sig Kadet Seniorita The Venture 60 is about 5 feet behind the tail of the Seniorita. The Seniorita was flying with a Canon 35mm camera and tripped with a servo. *Fred Cronenwett photo.*

If you need to pass, the chase model should climb and then fly over the lead model with the lines going over the head of the lead pilot.

Stacked formations of four or five models is possible, but this requires practice and matched models. We did this once I can't wait to try this again.

But this requires the third model to fly formation behind the second model and so on. Basically, each person is really flying formation with the model ahead of them and should not really care where the other models are located. If everyone who is flying in the circle follows these rules it works very well.

Fred Cronenwett can be contacted in care of Flying Lines.

Are you proud of a clever idea? Send it *Flying Lines* for the "Shop Tips" column for a full-blown technical article!

News from the Northwest Skyraiders

Editor: **Dave Gardner,** 15107 SE 145th Pl., Renton, WA 98059 — Phone: (425) 226-9667 — E-mail: DGardner55@aol.com

Skyraiders Web site: www.nwskyraiders.org

And now for something completely different..... Modeling related news and bits:

THE MOLE REPORT:

From **Steve Helmick:**

Subject: API: The Pee Patch field in Kent ... Moles injure Chipmunk

I found the following online, plus more, and still looking. My wife had a recipe for a mole repellent that was dishwashing liquid (whatever that is), vinegar and water. Trying to find out the proportions. Meanwhile, Castor Oil is said to be a good repellent. Betcha Nitro Benzine would be better! Anybody have a good recipe for a homebrewed Mole Inhibitor, please bring it to our attention! *(Editor's note: **Ron Canaan** and **Chris Gomez** have found the castor oil fuel residue from flying in circles creates a ring of no-moles!)*

The website for the article below is www.bugsmart.com/Index.mv?parm_func=PI_Moles

Rodenticide:

Another effective means of controlling moles is through the use of rodenticide. Even though moles are not rodents, rodenticide works on moles in the same way it would rats. The rodenticide we recommend to use is an anticoagulant. Anticoagulants work basically by causing death through internal bleeding. By placing a bait block in each of the mole mounds you see around the area you are trying to eradicate of moles, you can get highly effective control of moles.

Bugsmart offers only rodenticide that the professional pest control operators use so that you can get professional results without paying professional prices.

Mole repellent: Mole repellent works utilizing the ingredient castor oil. Repellent is effective in preventing a problem before it gets totally out of control. This type of treatment is non-toxic to the moles. Instead of relying on death as a deterrent, it relies on the castor oil's repellent effect. This is an excellent method of mole control for the animal lover.

Would the rodenticide be legal? Do we care? Can we afford to buy some? Can we afford NOT to buy some?

Jerry Day's new Chipmunk had the landing gear blocks ripped out on its third flight on a recent Saturday. How many more Chipmunks will have to suffer for the thoughtless acts of those @8&%^+!!!@#$_ Moles?

Snug lines, Steve

Steve-O-Bat:

I've been told that well used cat kitty litter, well soaked with cat urine, is very effective. In fact, moisten it a little with water after pouring it down the moles' holes. The little critters are very odor sensitive and this really gets them annoyed.

Pete Young

(Editor's note: Looks like the natural byproduct of our flying (castor oil, not cat urine!) is an effective repellent for the moles. Just keep those mixtures rich and lay down a smoke trail of 24% castor oil!)

FLYING SITE REPORT:

We have some issues with availability of flying sites for contests! The Emerald Downs site is still "iffy," and is still probably not securely available for our contests. We can still fly out there on a random basis, but the car folks are paying the bills, so they get to say who gets to be where and when. Riverwalk Park still has political issues, but only enough to prevent us from developing the site, not to keep us from flying there.

For paved surface flying, Mike Potter reports that the field at Clover Park Technical College is still sorta available on weekends, but is currently full of buses! The other two parking areas which we used for last years' Roundup are presumably available, and are passable, but not ideal.

If any of you have any thoughts on a good site for our two contests, let us know. These events may be in danger of being postponed for 2002 unless we have a working site for them!

Send your local club news to Flying Lines, *so that modelers around the region know what you're up to!*

THE COGNITIVE MODELER

Thinking about our hobby ... By Mark Hansen

By Mark Hansen

Hello all.

It has been some time since my last article and much has happened in the Pacific Northwest control line modeling scene.

As I am sure most are already aware, the Control Line Contest Board has been split into five boards representing each of the different disciplines, Combat, Speed, Carrier, Racing, and Stunt; I have been chosen from our district as the Combat board member, a position I am happy to serve.

As a new contest board member there are lots of things to learn, and procedures to follow, so for this installment of the cognitive modeler let's talk about rules.

After being appointed to the contest board I received a very interesting packet in the mail, titled "Contest Board Procedures." Most of this document was concerned with the somewhat Byzantine process of rules change proposals, and cross proposals, but section two stood out as very applicable to a current Northwest modeling situation. I will reprint it exactly:

2. ANALYSIS OF PROPOSALS BY CONTEST BOARDS

- **Manufacturing**—Will current equipment tend to be made obsolete?
- **Protests**—Will the change tend to eliminate a source of protests at meets or are protests more likely.
- **Model Processing Time**—Will the change tend to increase or decrease the time required to process models for competition?
- **Designs**—Will the builder be given more or less freedom of choice in design?
- **Contest**—Will the effort required to conduct a contest be increased or decreased?
- **Present Models**—Will a modeler be able to effectively compete using current models, or will the modeler be required to build new ones?
- **Effect on Competition**—Will the net effect of the proposed change , if passed, be to encourage or discourage contest participation?

In the last issue of *Flying Lines,* all of the Northwest rules rules were reprinted, and when I skimmed through them applying these newly learned standards, I was surprised to find that all events were (for the most part) in compliance except **one — Nostalgia Diesel Combat.**

My motivation for looking through these rules was Mel Lyne's announcement that he was changing the rules for the upcoming "Money" contest in Arlington, Wash., because the Grish-made, 8"x6" Tornado propeller was no longer available (John Thompson cautioned against mandating name brand when these rules were up for approval). By mandating the propeller the current rules are made (to be) in conflict with five of the six listed points! When one goes though the entire list of current rules in this event, they will find that only the pull test and line size requirement do not conflict with the above standards.

What is most irritating about the current set of rules is that the propeller required is not being used in the stock configuration; the protagonists of this event depitch the prop to somewhere in 8"x4" area to allow the engine to rev up more. Rule 1 was designed to keep high-revving dual ball bearing ABC's out of the event (as well as the high quality dual ball bearing PAWs).

I could go on, but what is the point? The current rules do not conform to any sort of logical standards, set forth by the AMA, MAAC, or any other governing body, and have in effect micromanaged the event into a state of competitive apathy. If this event is to flourish (this event has not been held successful one time south of the Canadian border), these rules should be abolished.

A more logical approach to this event might be to eliminate the engine type restrictions, propeller requirement, and most of the building material restrictions, and enforce the already mandated speed limit. The above changes would allow modelers more freedom to be creative with their combinations of engine propeller, and building method — and, after all, isn't that why most people build models, so they can have a creative out let?

Comments can be sent to Mark Hansen at FastCombat@aol.com, or by mail in care of Flying Lines.

The Real 'Dirt'

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

John Thompson's column "Critical Mass" (FL #174) brought back many pleasant memories. Of Wednesday evenings.

We had an active CL club, based at a dedicated control-line site within Marymoor Park in Redmond, Wash. Two full-size circles, one smaller. Things were going quite nicely, lots of activity. But there was a problem: One could never be certain there would be enough other fliers out on any given evening to make things entertaining or even to act as pit man/launcher. Worse, sometimes arrangements would be to meet at the field and one or more people would not show.

A certain critical mass had not yet been created. And it was unlikely to be created any time soon. Run the numbers. With about 50 members — even at the peak when there were about 100 — one could assume that during any given week only 10 to 20 would actually be flying. Divide that by seven days in a week, with most of the flying taking place Saturday and Sunday, and one can see how even an active club would not be overusing the facility on week days.

Our solution was to pick one weekday for club flying sessions. For our needs, and for reasons possibly unique to that club, Wednesday was the chosen day. Weekends were for contests and/or family stuff. Wednesday following a contest was viewed as enough time to get back into action. Or with equipment to test, doing so on Wednesday gave one time for fix-and-tune sessions prior to an upcoming contest.

But it's not enough to just make the announcement. Several of us agreed that for the first month, no matter what, we would be there. Every single Wednesday. Rain or shine. Models ready to fly or not. No excuses.

It was *wildly* successful. In only a month or so everybody knew we were serious, modelers began showing up in significant numbers. While there are no records of what happened and when it happened, I still remember many evenings when the three CL circles were not only occupied, there were models in the air. In fact, once we really got going, activity would bleed over into an adjacent field which at the time was (infrequently) used for polo. These were heads-down flying sessions where most of us were prepping to fly when not having a handle in our hands. But I remember times when I would take a break, look around and see as many as seven circles in use, this being defined as there actually being a CL model flying around.

We drew flying and non-flying CL folk. As we flew from grass, not all models could be flown. No matter, CL modelers of all stripes would show just to socialize, maybe trade and sell equipment. We even pulled in free-flight guys. None other than Homer Smith — the best Dist. XI AMA vice president we've ever had or will have in the future — could be seen in attendance. Believe it or not, there were a few RC guys who would fly with us on a regular basis.

Perhaps the best endorsement of our Wednesday-night flying sessions comes each time Phil Granderson and I get together. Phil remembers those evenings as some of his very best times flying CL. He would sometimes actually take a day off from work on Tuesday or Wednesday just to get ready for that week's flying session!

Also entertaining was what developed at the end of many sessions. We had developed some FF activity in our club and a few of us began ending the evening by packing up before it got dark, strolling across an access road to the polo field. Absolutely dead-calm air. We'd all toss hand-launch gliders simultaneously, last down won. Simple. This also became a pretty big deal, somebody yelling "Go!" and two, sometimes three dozen HLGs arcing up into the sky and into one of the most beautiful sights in modeling, that long, slow glide back down.

Aside from individual experiences and people, I remember two things about our Wednesday-night flying activities: How easy it was to get it going, how popular it quickly became. Having already addressed the latter, it was almost sinfully easy to make a beginning. One or two announcements in the newsletter, lots of word-of-mouth advertising, the absolute reliability of only four or five fliers to be there each and every Wednesday evening during the beginning stages. Once we hit

critical mass, the program took on a life of its own. No phone calls, no record keeping, no expenses, no maintenance. In addition — and no small factor in our success as a club — local hobby shops had a specific time and place to refer those just-looking prospects.

It was great! And unlike some of our mutual experiences from the past, this is one which can actually be recreated successfully. By even very small groups of CL fliers.

Skill-level classes and value of same

Recently in *FL* I noticed mention of skill-level classes in Stunt being regarded as some sort of missing ingredient when it comes to other CL events. I could not disagree more. In my opinion, the use of skill classes in precision aerobatics, at best, appear to do no harm. But I do not see where long-term they actually do a lot of good. In short, the value of same is highly over-rated. Especially by some seeing the success of Stunt in general, wishing to see the same success in their favorite events.

In any case, please remember that *only* AMA Stunt — Precision Aerobatics if you wish — uses skill-level classes. *Both Old-Time Stunt and Classic Stunt are open competition.* There are no skill classes in either event and they are doing just fine. It is true that PA typically sees more entries, but in a twist of fate and logic, OTS and Classic are the new kids on the block and so of course take a back seat to PA. Furthermore, eligible models are not only low-tech in a high-tech world, the requirements are more narrowly focused, can't be too "creative" without running afoul of the law. And with PA models — this is a generalization, don't beat me up about it — the performance capabilities of each is higher. As we are performance-oriented hobbyists, of course the baddest of the bad tugs hard when choosing the next project and/or an event in which to compete.

Lest the obvious again escape notice, please note that in a great many cases a competitor in Classic Stunt will the next day sidle over to PA with the same exact model still being in use. They simply don't care that Classic is open comp, PA offers a class tailored approximately to their current abilities. Never, ever have I heard a single mention of applying skill-level classes to either OTS or Classic; such is not viewed as being needed or even attractive.

It would seem to follow that if the only users of skill-level classes in the Northwest CL scene see no value in applying a similar format to our other two events, there can be no rational case behind proposing same for such radically different events as Racing or Combat.

A Note from the Flying Lines Publisher

I hope to clear up some minor confusion regarding payment to *Flying Lines*. Recently the bank that I have been doing business with started giving me grief about the checks I was depositing that were made out to "*Flying Lines.*" In reality, I was using my own personal account to process these checks, and this had not been any problem for several years.

Citing new, stiffer regulations, the bank indicated that I could not do this anymore, so we subsequently started asking that payments be made out to "Mike Hazel." This whole situation has been remedied by opening up a new account which is in the name of *Flying Lines*. Effectively immediately, you can make out your renewal checks (or money orders) to "*Flying Lines.*"

We will again take an opportunity to remind everyone to watch on the mailing label the numbers that follow your name. These indicate the start/end issue number that your subscription is good for. When you note your "number is coming up," please help us out and just go ahead and send in that renewal. Then we won't have to do the reminders which just take extra time, and may delay your issue.

Thanks again for helping to promote Control Line activity in the Northwest by subscribing to *Flying Lines.*

— Mike Hazel

Your number's up!

You don't want to drop off the list of "those in the know" about Northwest control-line model aviation. It's time to renew for the following people: **Mark Heppe, Bob Huber, Shawn Parker, Orin Humphries, Gerald Schamp.**

Rewards for *FL's* faithful!

Sign up a new *FL* subscriber and get a month added to your subscription! Contribute an article, and get a month added to your subscription! It's *FL's* way of saying, "Thanks for your help!"

THE WAY OVER TOP!

By Combat Maniac

"Space," not "the final frontier," but "what you need more of."

Sooner or later (later is more like "now" for us older geezers) you are gonna find that your faithful '59 Ford Wagon just doesn't hold enough models for all the events you're gonna crash models in. This could have something to do with all your special support equipment that you find indispensable at this time in your life. e.g. oxygen bottles, walker, chaise-lounge, Coleman cooler for medications etc.

So here's a handy-dandy idea for a model box that comes ready-made and won't cost you a cent. In fact it'll even score you some points on the home front!

Now, if your wife's like mine, she's probably always after you to throw stuff out. So you go down to your basement, or into that long-sealed-off part of the house, and you look around for one of those old upright wooden clothes-storage wardrobes, the type than grandma used to have 60 years ago. These things are BIG and solid, with lots of room for model storage.

They are a tad heavy, but they do offer first class protection for models, and your old Ford wagon is still pretty solid, eh?

So, the evening before you're off to the contest, round up half a dozen neighbors, or even better, your neighbors' teen-age sons. You know, the big muscle-beach type that are used to lifting big beer cases. This is relatively easy for the first time. But for the second and subsequent times, you'll have to get a little inventive to get them to come over. I find if you open up your kitchen windows and let off a smoke device, you'll get lots of help there in a hurry! So you get them to heft the wardrobe onto the roof of your wagon, with the swing door facing up. Now all you've got to do is tie it on. Rope is good, but the handyman's secret weapon, duct tape, is quicker and less work. Besides, it'll match those little squares of tape you've been putting over the rust holes in the body the past few years.

And Bingo! You've doubled or tripled your model hauling capacity. So, if the women don't find ya handsome, they should at least find ya handy!

Keep yer stick on the ice. I'm pulling for ya. We're all in this together.

SHOP TIPS

CLEVER BUILDING IDEAS FROM *FLYING LINES* READERS

• **Inexpensive finger shields:** Go down to your local auto parts store and look at automotive heater hose. It generally has a pink outside skin. Stick your flicking finger in it and find the one that is snug. Make off with about 3 feet of it (a 10-year supply) and when you get home carefully slit the outside sheath with a knife. Peel this back and unwrap the filament strands underneath. What you have left is a single layer of snug-fitting tough rubber tube. Chop off pieces to suit your finger length.

— Mel Lyne

• **Corralling the CYA:** One of the problems with cyanoacrylate glue is that, when the bottle has been used a bit, the tip gets sloppy. You try to put a drop on a particular spot and it drips all over the stuff you *don't* want glue on. Your hobby shop may have the solution. They sell little Teflon squeeze-bulbs with tiny tips for a few cents apiece. These are fabulous. You take the top off your cya bottle, squeeze some glue in, and then you can aim the drop right at the spot you want to glue! The bulbs are reusable.

— John Thompson

• **A substitute for kevlar thread:** If you are building Russian-style center ribs and need tough thread to wrap them (especially that spot in the rear), try using unwaxed dental floss. It is incredibly tough and is flat, so it lays nicely on the wood. I like to smear a little Ambroid over the finished "wrap" to anchor it. I find mint-flavored floss is nice, and then you finish off with a good "acetone buzz" from the Ambroid. That old-fashioned model airplane glue smell always brings back 45 years of memories building planes. In the workshop life is so good!

— Mel Lyne

Combat Cornucopia

Combat news and views by Mel Lyne

Combat Equipment Tips

1. Pressure fuel systems.

• Always wear protective eyewear when working near pressure fuel systems. Keep a water jug close by for emergency eye flushing. Methyl Hydrate (alcohol) attacks the optic nerve and blood-rich membranes surrounding the eye. It is vitally important to flush fuel from eyes immediately if there is an accident.

• Used 2-ounce syringes can usually be bought quite cheaply from your local veterinarian. Before you use them, install a 1/2-inch-long sheet metal screw near the top of the body. This prevents the plunger from being accidentally forced out of the body.

• On your bladder line install a pinch clip. Make this by taking a large size "Perfect" line connector, soldering the sliding sleeve to lock it up in the middle position, and sawing through it at the center. This makes two handy pinch clips. These are easier to operate than hemostats and don't get lost since they are permanently on the bladder feed pipe.

2. If you have items that are easily lost in the grass, such as hemostats, line reel clamps, glow plug wrench etc, tie a small piece of fluorescent flagging tape to them. *(Or paint 'em bright colors. — editor)*

3. If your knees aren't as young as they used to be you'll appreciate a kneeling pad used by gardeners. For less than 4 bucks one of these foam pads can make the kneeling chores servicing planes in the pits a lot easier.

Mel Lyne can be contacted in care of Flying Lines.

Kwik Link Danger!

By Brett Buck

forwarded from the Internet by Howard Rush.

Commercial 4-40 Kwik-Links are living on borrowed time. They will eventually fail, it's not a matter of if, but when. No matter how good they seem, something will fatigue and break with the kind of pounding they get.

I've seen it a couple of dozen times.

The only removable parts that I personally feel safe with and that are widely commercially available are the Rocket City #87 ball links. Others may work and last just as long, but as one of (if not) the first person to use them in a stunt plane, I have a lot of time on them, and they have simply negligible wear and no visible fatigue. With all apologies to Tom Dixon (from his recent *Stunt News* articles), I've seen a lot more soldered washers fail than ball links.

As far as history goes, as far as I know, I was the first one to try the #87 ball links, in about 1985, on my first full-fuse Imitation. Up till then, Ted Fancher and others had been using the transparent nylon 2-56 kind, which also seemed to be pretty immune to problems. After it looked like it was going to work, I mentioned it to Ted, and I think the first spot they appeared on published plans was on the Trivial Pursuit (although I think he used them in the Temptation in 1989, too). That's how they became a de facto standard.

There is only one failure mode that I am aware of. Never, ever, bottom out the pushrod in the threaded hole. If you do, the plastic near the junction between the round part and the flat part will be over-stressed.

This is so easy to do that when I tested it, I couldn't tell when I hit the bottom. Measure the depth, mark the pushrod 1/16" short, and never exceed the mark. I also use some old links for set-up, and then when I get to the final assembly, I replace them with brand new parts straight out of the package.

The 4-40 fittings into the tubular pushrod are more likely to fail than the link itself or the bolts attaching the links to the uprights. If you don't use good craftsmanship on the threaded inserts (bolts, 4-40 threaded rod, pre-machined inserts) glue job), it will pull out. I know of one guy who used Hot Stuff! It worked longer than you would think, but not long enough. But it doesn't take anything more than a good glue job and a hole near the free end (to form a J-B Weld "rivet").

I use the #87 ball links from the bellcrank to flap pushrod, on both ends, and another ball link on the front of the flap to elevator pushrod. The rear has a bent 3/32" music wire with a 1/32" music wire keeper (that idea was ripped off from Ted). This allows the whole rod to be turned to adjust the flap-elevator neutral. I glue a nut to the flap-elevator threaded end to prevent bottoming out the threads in the front ball link.

FLYING LINES is produced by a staff of dedicated volunteers interested in keeping lines of communication open between Northwest region control-line model aviators. *FLYING LINES* is independent of any organization, and is made possible by the financial support of its subscribers.

The staff: Jim Cameron; Chris Cox, Fred Cronenwett; Bill Darkow; Dave Gardner; Paul Gibeault; Mark Hansen; Mel Lyne; Nils Norling; Mike Potter; Howard Rush; Dan Rutherford; Todd Ryan; Gerald Schamp; Buzz Wilson; John Thompson, editor; Mike Hazel, publisher — and *you!*

Contributions for publication are welcomed. Any material submitted to the editor which is not for publication should be indicated as such. Duplication of contents is permissible, provided source is acknowledged.

FLYING LINES is published nine times a year. Subscription rate is $14 for USA and $15 for Canada (U.S. funds). Expiration is noted on the mailing label — issue number listed after name. Please make checks payable to *Flying Lines*.

FLYING LINES
2456 Quince St.
Eugene, OR 97404

Rush to:

First Class Mail

John M. Thompson
2456 Quince St.
Eugene, OR 97404