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NEWS OF NORTHWEST CONTROL LINE MODEL AVIATION

1073 WINDEMERE DRIVE NW
SALEM, OREGON 97304

EDITOR: MIKE HAZEL

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ISSUE NUMBER 81

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Competition Records
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Photos and more

Subscribers: Please note the issue numbers listed on your mailing sticker. If the last number is circled, then this is your last issue! Please send in renewal promptly to ensure continuous service.

COCKPIT CHATTER



NOTES FROM THE EDITORS' DESK

Well, here we are a bit late again. Something I was going to hold off on, we'll cover right up front. This newsletter is going on a temporary production slowdown. Please let me explain: To properly set the scenario, here's a question I am occasionally asked, "How do you keep up with both the newsletter and writing for Model Builder?" OK folks, the answer is that I actually don't. Perhaps that is not 100% truthful, but in reality, several other areas have slid while trying keep up the pace.

Besides these two activities, sometimes I even like to get in some building and flying! Also, like most folks, I have a family and a job to tend to. The next few weeks my work is going to take an increased amount of my attention and energies. The bottom line is that something has got to give.

Until next fall, our publication schedule will be a bit lighter, and perhaps somewhat irregular. In the meantime, be looking for larger "combined" issues. It is a bit less effort to put out fewer, larger editions, than it is regular issues on a regular basis. As you know, you will still get your money's worth, as subscriptions are based upon number of issues and not a period of time. The next issue will come after the NW Regionals, and will be labeled May-June. I guarantee it will be a biggie. Because of that, it may be considered a double issue, and count for two on the subscription. We'll see.

Meanwhile, back at the ranch, other areas are affected. I already passed on one deadline for MB. No control line in the mag for the July issue (out June 1st). Also, modeling activities will be cut to the bone and will include only a couple of serious competitive endeavors. Enuf of that, here's other news.....

You will find in this issue what should be an up to date contest calendar for the year. For the benefit of our other West coast readers, a California/Arizona is also included. Anyone wishing an extra copy of the calendar to hang up as a handy reminder, can get a freebie by sending a SASE to Flying Lines and requesting same.

After the calendar was finished, it seems that an area was omitted. The Northern California area competes primarily under W.A.M. jurisdiction, but I forgot that these meets are now done under a double sanction, so that AMA'ers can also compete. Sorry bout that!

By the time many of you receive this issue, the 1987 Drizzle Circuit will be history, or about to be history. While the Super Sport event looks like it has Dave Green's ownership this year, Sport Race top placing is still up for grabs.

Now to play devil's advocate....Has the Drizzle Circuit seen its better days? This season saw some rather mediocre turnouts, not so much in total numbers, but in the fact that it was practically the same faces every race. With few exceptions, the entrants were the racing hardcores. Is it time to start with a fresh new approach? What would it be? Or does it matter that just a few dedicated individuals continue to keep up the activity to ward off the winter doldrums (the original reason!)

Racers, let's talk. I know a couple of you have some ideas on another subject, as well.

SEE YA'LL AT THE REGIONALS!

page two

MIKE

AIRMAIL



COMMENTS, NEWS , and VIEWS from FL READERS

Dear Mike,

I am enclosing a slightly revised ad to replace the one that you have been running.

I think that your readers will be interested to know that we can now supply our Fox 40 Delux, the one with the two ball bearings and the spinner, in control line form. Order #14098, price, \$79.95.

Modelers who would want to try one, I made up to customer orders from parts on hand. The list price is \$79.95, and our standard dealer discount would apply to any dealer who might want to stock one. We think this will make a nice running stunt motor. It is quite light weight, yet is quite a bit more energetic than our well known stunt 35.

We wish you all the good things.

.....Duke Fox, Fox Manufacturing, 5305 Towson Ave., Fort Smith, ARK 72901

Dear Mike,

I am quite pleased to record a 16th place in your Northwest Competition Standings. I am even more pleased that buddy Mel Lyne managed 2nd place.

Mel and I have had monumental battles all over the Northwest, each using the same coy tactics. When the horn goes we both go inverted hoping to sneak up on each other-- they tell us it's very good to watch whatever we are trying to do, usually lots of near misses.

I am enclosing a couple of pictures of my latest Bipe. It comes complete with sexy dolly driver, a Maltese Cross on rudder and the VonBoden name which usually gets chawed on by Salter or Lyne.

This is my original design which is a very nice sport fool around ship, it will do flip overs on its own axis. This is the third time I have built this Supertigre 40 powered model. It's really rugged, the top wing is mounted on the body with a pylon, the wing struts are plywood squares with the centres cut out. The other identical Bipe is 17 years old and has a Merco 49 with a Roberts 3 line throttle system.

Keep up the good work, the lights are still burning bright in U-control cities all over the Northwest.

..... Frank Boden, Burnaby, British Columbia

(ED Note: Thanks for the photos- will try to get into a future issue)

Dear FL,

Really enjoyed the cartoons in issue #79 and the truism about the value of an RC modeler versus a talking frog.

Had intended mentioning the excellent taste of Pat Leonard also, but on closer reading of his letter, don't think the guy has a full load..

.....maybe the long winters and general isolation! Russian, huh?

Appropriate I guess...after all, Montana borders on Siberia doesn't it? John Thompson's off the wall events sound great.

..... Larry Miles, 2112 Scott Ave., Independence, MO 64052

(ED Note: Uh-oh! Now you've done it Larry! I'm sure we'll be seeing some snowballs from Montana now.)

Dear Mike,

A few weeks ago, I came across an old Air Trails magazine (1952) with the "Smoothie" plans and article. I had the plans enlarged to full size and will give copies, plus reproductions of the construction article and pictures of the original plane to the first five finishers in Old Time Stunt at the Regionals. These are probably collectors items and I hope you can promote them through Flying Lines to encourage a good turnout for the event. Potentially, this could be one of the biggest events at the Regionals and at other contests- all it needs is a little promotion.

Finally, a passing thought to stir controversy and comment. I have felt for some time that the old time stunt rules need to be changed to cut the point differential between flapped and fixed wing aircraft to 10 points rather than 20. There is only one maneuver in the OTS pattern where flaps really help- the square loop. The scoring differential is so great that it simply precludes flapped airplanes from being competitive. As a result, OTS events at any contest, including the Nationals, are dominated by Ringmasters, Barnstormers, with an occasional All-American or Stuntwagon. It's gotten to be a stagnant event, much as regular stunt was in the late 1950's and early 1960's when Noblers dominated the scene.

Halving the point spread would result in lots of new designs showing up at contests. The original Don Still Stuka, the early Palmer airplanes (Mars, Smoothie, Stuka, Venus, Chief, Squaw, etc.) plus the original Nobler would suddenly become competitive. Plus- and this is a big plus, I believe the flapped airplanes are still highly competitive at all PAMPA levels through advanced. I truly believe that the ability to use an airplane in two stunt events would encourage those who are interested in stunt but don't necessarily aspire to the national championship. Why not try it for a year or two in the Northwest and see what happens? Look what NW sport racing did to stimulate interest all across the country. Here's a chance to do it again, in one of control line's biggest events.

A postscript to the above is that the new, inexpensive bushed .35 and .40 sized engines available from OS and other manufacturers are light enough and well suited from a power standpoint to OTS airplanes and all .35 sized kits. They work quite well out of the box and I can tell you from personal knowledge that at least two former national champions are flying the OS 40 FPS in their new airplanes. I loaned one of mine to one of these gentlemen, who is well known for the color of his airplanes, and it has been boring holes through the sky since early December. The current East coast fad of highly-reworked racing .40's with low-pitched props, tuned pipes and speed governors is just that- a fad.

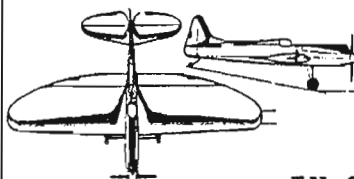
A better role model is Ted Fancher, whose knowledge of engines is confined to knowing that that's where you attached the prop. Ted simply flies any airplane better than most people, and that's why he wins. Stunt is not, and in my opinion never will be, a high-tech event in which one needs fancy equipment to be competitive.

..... Don McClave, 7719 SE 28th Ave., Portland, OR 97202

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HOOK

NOOK

navy carrier notes by orin humphries

There has been more advancement in Profile Carrier technology in the past 18 months than in the last 6 years. My present project is already obsolete and I haven't painted it yet. So, what is on

THE LEADING EDGE

This one will deal with airframes, and my next piece will deal with powerplants, to what little extent I can help you.

In the latter half of the '70s I chose to explore thin airfoils while someone back East took thick. Mine were for Schmidt Aero-dynamics, a body of knowledge that leads to the slowest possible flight with airflow attached to the wing surface. He took stunter style airfoils, thick and symmetrical, just a shot in the dark.

He was right and I was wrong. My luck. I tried to use my brain. Anybody need a used brain? No warranty.

The thin asymmetric airfoil will fly slowly, all right, but that is not the slowest possible "flight". I never got slower than 133 seconds. The longest possible times come from "prop hanging", and the wing is not flying during this; it is completely stalled. Flying slowly is still faster than mushing along at 60 degrees nose up.

The problem with asymmetric airfoils is that they have a huge "pitching moment", according to the aerodynamics books. This means that when a gust of wind hits them while mushing along they generate forces that pitch the nose down to a level attitude. This restores the airflow to the surface of the wing and you are flying again, at double your mushing speed. The gust can come from Mother Nature or from your having to goose the engine.

Symmetric airfoils, it turns out, have no pitching moment about the aerodynamic center. Apparently, the wing stays nose high in gusts. This is the only plausible reason the "big kids'" planes turn in slow speed times between three and five minutes. If you look at their planes in the magazines and ours, there is no detectable difference, save the airfoil.

Bill Melton of Profile GUARDIAN fame shares with me that he is going from a 10% or 12% symmetrical airfoil to 15% on his next one. I am listening.

According to Bill, you are not out of kindergarten until your slow time is over 180 seconds, sports fans.

Moving on, movable trailing edge devices (flaps, ailerons) make your plane marginally manageable in wind conditions. It undulates about all three axes in gusts, taking seven oscillations to damp out. But without them you cannot achieve the high times. The answer is to have two planes, one with these devices, for calm days, and one without them for windy (contests!) ones.

Actually, I have come up with a way to have selectable trailing edge devices so one plane can fly with or without moveable surfaces on any particular flight. You put metal tabs on the corner of the flap that can be turned either to hold the flap up or out of the way to let it actuate. I am using landing gear straps for the tabs.

I am giving my technology away, again, but Bill shared his with me, and neither of us started from scratch.

If you have a line slider, you must align the slot of the bell crank with the low speed position. Otherwise you can get into a coupling between yaw and throttle that will put the airplane into a flat spin on a windy day. You must also have a catch that will retain the slide at the aft position once tripped. We tried it without. Re-read the third sentence in this paragraph.

Pursuit of high nitro has been something else! Next time I will tell you what I have found so far.

Please feel especially invited to send in your comments or to share your insight with us. This is not just "my" space, friends.

Orin Humphries, N.6803 Forker Rd., Spokane, WA 99207(temp.)

THE DRIZZLE CIRCUIT



ROUND and ROUND in the RAIN?

March 8th saw the running of DC #4, which was the next to last one. This made this meet somewhat of a key to final jockeying for season placing just prior to the finale.

A new entry in the field was Quentin Brown, who was pitted by Dan Burdick. His piloting was a bit shakey during the first round, but was flying fairly well during the second round. What is noteworthy here, is that Quentin is eleven years old....not a bad showing.

The secondary event was NW Sport Combat.

RESULTS:

NW SPORT COMBAT (5 entries)

- 1) Glenn Salter
- 2) Dick Salter
- 3) John Hall
- 4) Bob Danielson

NW SUPER SPORT RACE (8 entries)

- | | |
|------------------|-----------|
| 1) Dave Green | 7:03 |
| 2) S&S Team | 7:46 |
| 3) SHT Team | 11:34 |
| 4) Dick Peterson | 4:05 heat |

NW SPORT RACE (11 entries)

- | | |
|------------------|-------|
| 1) Jim Cameron | 9:57 |
| 2) Bob Danielson | 10:17 |
| 3) Dick Peterson | 10:20 |
| 4) Dave Green | 12:16 |

The fifth, and final, installment takes place on April 12th at Delta Park. The secondary event will be AMA Rat Race. Good luck, racers!

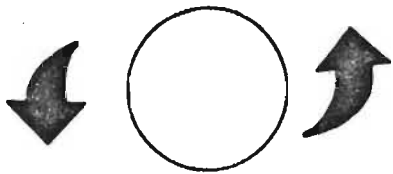
Drizzle Circuit Points Totals

NW SPORT RACE

- | | |
|--------------------|----|
| 1) Jim Cameron | 29 |
| Dave Green | 29 |
| 3) SHT Team | 25 |
| 4) Bob Danielson | 21 |
| 5) Wayne Drake | 19 |
| Dick Peterson | 19 |
| 7) S&S Team | 8 |
| Dick McConnell | 8 |
| 9) George Mickey | 5 |
| 10) Quentin Brown | 2 |
| Dan Burdick | 2 |
| 12) Jason Huntress | 1 |

NW SUPER SPORT RACE

- | | |
|-------------------|----|
| 1) Dave Green | 29 |
| 2) SHT Team | 20 |
| 3) S&S Team | 17 |
| 4) Dick McConnell | 14 |
| 5) Bob Danielson | 11 |
| 6) Jim Cameron | 7 |
| 7) George Mickey | 6 |
| 8) Dick Peterson | 5 |



ROUND & ROUND

By: John Thompson

In this, the best winter for flying in the Northwest in some years, the Round & Round air fleet has been hanging in the shop gathering dust as its owner struggles with a modeling-nightmare work schedule. It's gone from bad to worse, as Saturdays have been added to Sundays and days off now fall on Monday's and Tuesdays, and the standard shift is 3 p.m.-midnight. Anybody for some morning flying sessions?

Though the professional reassignment has made flying difficult, it hasn't closed the workshop doors, though we're still trying to find ways of spending time in the airplane factory. The 1987 combat fleet is taking shape slowly, though the stunt projects are gathering dust again as summer contest season approaches.

However, the approach of the summer contest season turns one's eyes to new developments in the hobby. In this workshop, a couple of items stand out.

First of all, the new Fox Combat Special Mk VI has arrived. It's a very different engine in approximately the same crankcase. We hope to get out to the Eugene Prop Spinners' fun fly this coming Saturday, March 31, before that nasty night shift, to try it out. FL publisher Mike Hazel has received another copy from Fox Mfg. Corp., complete with a factory-opened crankshaft for fast combat use. Our plan is to compare the two engines before grinding on the shaft of our stock version. The ABC engine, with a ringed piston, has few parts that match the older Mk IV. We may have to "learn the Fox" all over again.

But, if you've been waiting to see the engines shipped before ordering, you can go ahead and send your \$80 to Fox and get your new toy! It's being sold factory-direct only.

Secondly we read that Cipolla is producing a plain bearing .35 designed for use in sport racing events such as Midwest Sport Race and our own Northwest Super Sport Race. This could be the answer to the rarity of engines for our beloved regional go-fast event, giving us an alternative to the venerable K&B .35 at about 7 oz. engine weight. Motore Cipolla Combat has the distributorship.

Speaking of sport racing, the quickie rat event passed the CL Contest Board on the first ballot, with another vote to go. We're opposed, and we recommend other racers write the contest board members and object. If there's going to be another national event aimed at the sport race echelon, it ought to be more in line with the most common sport racing configuration, such as those used in the Midwest, Florida, and all over the West, rather than an event that is known and flown only in the Texas region. Quickie rat is a lot closer to rat race than it is to sport race, in our judgment (Feature times commonly range in the 6:25-6:50 range). Write AMA now and ask that your comments be distributed to the CLCB. Personally, our opinion is that we should improve the events we have and NOT add more racing events.

Tips and ribs:

BIG WHEEL -- Congratulations to precision aerobatics master Don McClave for being named executive director of the Portland Chamber of Commerce. This guy flies in elevated circles!

WORLD RENOWN -- FL columnists continue to be circulated widely in other publications. Recently we've seen Orin Humphries' carrier column in Hi-Lo Landings, Paul Walker's stunt column in Pro-Stunt News, and Paul Gibeault's engine column in the Circlemasters' Flying Club Newsletter.

SPEED DEMON -- Chuck Schuette of Vancouver, Wash., is ranked No. 6 in the North American Speed Society's 1986 standings for his performance in FAI speed over the year.

TOP CHOPPER -- Phil Cartier of Hummelstown, PA, has been elected president of the Miniature Aircraft Combat Association. Pat Willcox is executive vice president, Mike Urban secretary-treasurer and John Thompson remains Dist. XI vice president.

TOP DROPPER -- Melvin Schuette of Auburn, Kans., has taken over as editor of Hi-Low Landings, the carrier newsletter. Former editor Leroy Cordes remains as publisher.

FINE TUNING -- Some minor schedule changes are due in the Northwest Regional Controline Championships, Memorial Day Weekend, Eugene, 1987, but all the same events will make the Regionals the usual extravaganza. The most notable change will be the return of Northwest Super Sport Race to the asphalt circle and the Saturday racing schedule. Northwest Sport Race will remain on grass on Sunday, but the movement of NWSS will allow an earlier start for the increasingly popular balloon bust. Depending on the event director, the carrier circle may be open on Saturday afternoon along with speed, to relieve the pressure on the circle Sunday.

ETHER-REAL -- We have it on good authority that a noted expert precision aerobatics flier is planning to stun the Northwest modeling community with use of a full-sized diesel in 1987. Mum's the word on his identity, but it's not who you might guess.

DECADE-ENCE -- Carolina-Taffinder celebrates its 10th anniversary of suppling a fine line of CL products with a nifty new catalog. Lots and lots of good stuff, especially tanks and fuels. Check it out.

BUSY BODIES -- Our England correspondent sends us the calendar for the Peterborough Model Flying Club, which has 30 members. This one club has 14 contests scheduled for 1987, ranging from rubber and electric FF to CL racing and combat, at two sites. Now, that's flying!
-- John Thompson, 1505 Ash Ave., Cottage Grove, OR 97424.

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1/8 x 2	.43	1/16 x 1/2	.14
3/16 x 2	.49	3/32 x 1/4	.10
1/4 x 2	.56	3/32 x 3/8	.12
1/32 x 3	.37	3/32 x 1/2	.16
1/20 x 3	.37	1/8 x 1/8	.08
1/16 x 3	.37 .49 .31	1/8 x 1/4	.11 .18
3/32 x 3	.44 .58 .37	1/8 x 3/8	.12 .18
1/8 x 3	.54 .71 .45	1/8 x 1/2	.18 .24
3/16 x 3	.62 .82 .55	3/16 x 3/16	.11 .18
1/4 x 3	.73 .95 .61	3/16 x 3/8	.17
5/16 x 3	.85	3/16 x 1/2	.22 .30
3/8 x 3	.88 1.24 .71	3/16 x 1/4	.16 .24
1/2 x 3	1.10 1.55	1/4 x 3/8	.19 .26
3/4 x 3	1.65	1/4 x 1/2	.21 .30
1/16 x 4	.58 .76 .48	1/4 x 3/4	.34 .44
3/32 x 4	.70 .94 .56	1/4 x 1	.40
1/8 x 4	.80 1.08 .66	5/16 x 5/16	.21 .28
3/16 x 4	.93 1.22 .75	3/8 x 3/8	.27 .37
1/4 x 4	1.10 1.34 .84	3/8 x 1/2	.32 .46
3/8 x 4	1.66 2.25	3/8 x 3/4	.42 .56
1/2 x 4	2.25 2.61	3/8 x 1	.52
		1/2 x 1/2	.36 .53
		1/2 x 3/4	.46 .62
		1/2 x 1	.58
		5/8 x 5/8	.48
		3/4 x 3/4	.67

Balsa TRIANGLES 36"

1/4 x 1/4	.25
3/8 x 3/8	.30
1/2 x 1/2	.35
3/4 x 3/4	.45
1" x 1"	.55

Balsa PLANKS 36"

1 x 1	.85
1 x 2	1.50
1 x 3	2.00
1 x 4	2.80
1 1/2 x 3	2.75
1 1/2 x 4	3.80
2 x 2	2.25
2 x 3	3.25
2 x 4	4.35
3 x 3	4.95
3 x 4	6.88

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1/4 x 3	.65
3/8 x 2	.68
3/8 x 3	.98
1/2 x 3	1.20

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1/4 x 3	.85
3/8 x 3	1.15
1/2 x 3	1.39
3/4 x 3	2.20
1" x 3	3.00
1/16 x 4	.78
3/32 x 4	.91
1/8 x 4	1.00
3/16 x 4	1.17
1/4 x 4	1.38
3/8 x 4	2.07
1/2 x 4	2.82

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5/16 x 1 1/4	.39
3/8 x 1 1/2	.46
1/2 x 2"	.70

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2 oz. Thick	5.50
2 oz. Thin	5.50

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3/16 x 1/4	.30
3/16 x 3/8	.38
3/16 x 1/2	.48
1/4 x 1/4	.40
1/4 x 1/4	.62
1/4 x 3/8	.67
1/4 x 3/4	.89
3/8 x 3/8	.80
3/8 x 1/2	.70
3/8 x 3/4	.90
1/2 x 1/2	.90
1/2 x 3/4	1.00

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20-3/32 x 3 x 36	8.45
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15-1/8 x 3 x 36	7.15
10-1/8 x 4 x 36	6.75
15-3/16 x 3 x 36	9.00
10-3/16 x 4 x 36	8.10
10-1/4 x 3 x 36	6.30
10-1/4 x 4 x 36	8.90
10-3/8 x 3 x 36	8.50
5-3/8 x 4 x 36	6.25
5-1/2 x 3 x 36	5.40
5-1/2 x 4 x 36	8.55
10-3/32 x 4 x 48	8.45
5-1/8 x 4 x 48	4.85
5-3/16 x 4 x 48	5.85
5-1/4 x 4 x 48	6.25

PINE STICKS 36" 48"

1/8 x 1/8	.13 .17
1/8 x 1/4	.16 .23
1/8 x 3/8	.20 .27
3/16 x 3/16	.17 .24
3/16 x 3/8	.23 .32
3/16 x 1/2	.30 .40
1/4 x 1/4	.26 .37
1/4 x 3/8	.30 .42
1/4 x 1/2	.34 .47
3/8 x 3/8	.37 .52

SPRUCE STICKS 36" 48"

1/8 x 1/8	.15
1/8 x 1/4	.18 .24
1/8 x 3/8	.20 .29
3/16 x 3/16	.25 .34
1/4 x 1/4	.31 .45
1/4 x 3/8	.36 .50
3/8 x 3/8	.45 .63
3/8 x 1/2	.55 .70
1/2 x 1/2	.60 .80
1/2 x 3/4	.68 .88

SPRUCE TRIANGLES 36"

3/8 x 3/8	.45
1/2 x 1/2	.61
3/4 x 3/4	.77

LITE PLY 48"

1/8 x 6	1.50
1/8 x 12	3.00

HARD MAPLE 18"

1/4 x 3/8	.40
3/8 x 3/8	.45
3/8 x 1/2	.50
3/8 x 3/4	.58
1/2 x 3/4	.68

BIRCH DOWELS 36"

1/8	.09
3/16	.11
1/4	.14
5/16	.25
3/8	.32

3 PLY BIRCH 48"

1/64 x 12	5.25
1/32 x 12	4.25
1/16 x 12	4.35
1/8 x 12	4.50

5 PLY BIRCH 48"

3/32 x 12	5.70
1/8 x 12	5.85
3/16 x 12	5.85
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NORTHWEST

by: DAVE GREEN

Northwest Super Sport Race is an event that, for me, has all the excitement of Slow Rat or Rat race, with half the expense. The K & B .35 is the predominant motor and works well stock, but is an even better motor with a little massaging. I have had to make the K & B go faster. Well, here it is. Everything you always wanted to know about the K & B .35, but were afraid to ask. Be sure to read all the way through before starting to grind.

First, disassemble the motor and clean all parts in lacquer thinner. Be sure to note how all the parts fit together. For later reassembly.

I'll start with the most important parts of the engine. A good ring to liner fit can mean the difference between just going around and going around fast.

Start by selecting a ring. Insert the ring in the liner and push it to the top of the piston travel using the bottom of the piston. Hold the liner up to a strong light. If any light shows around the ring, lay it aside, and get another ring. Keep looking until you find one that doesn't show light. Rotate the ring to several different positions and check again. If it still shows no light you have an excellent fit. This may require the purchase of several rings. If you can't find a tight one, your liner could be egg shaped. This may require you to either hone the liner round or find another liner.

After you have found the liner and ring you want, check for end gap. It should be .002 ~.004. If it is wider than this, (unlikely) you may have to find a new one.

If the gap is too tight, a small file can be used to open up the gap.

Now slip the ring onto the piston. Be very careful that you don't spread it too much. This can cause undue pressure on the ring when running and cause premature failure.

The piston is run stock. Assemble the conrod and wrist pin. Check for excess side play in the conrod. Too much play can cost you RPM's. Some of K & B's conrads are loose from the factory. The only thing you can do is keep looking for a good one.

Now take the liner in one hand and your trusty Dremel in the other and get ready to grind. Put a 1/8" carbide ball cutter in the Dremel. Begin by beveling the intake ports. We are trying to get rid of the square edge at the bottom of the ports. Bevel the outside of the liner from the bottom of the ports to the bottom of the liner. When you are done, you will have four grooves in the liner that taper out just above the bottom of the liner. You can polish these, but don't get carried away. Do not change the top of the ports.

Now take that same 1/8" cutter and make a half moon in the top center of each exhaust port. These should extend to the top of the exhaust opening in the case. I have tried opening the whole port but it just seemed to make the engine hard starting. Remove any burrs or flashing from the ports with a Xacto knife. Now you will need a brake cylinder hone and a variable speed drill. With medium pressure on the stones, and using solvent as a lubricant, very carefully hone about a 1½ thousandths taper in the liner. Be careful not to get too high in the liner. The stones should not be more than 1/8" above the exhaust ports. Without an inside micrometer to measure with, you will have to guess at how much you have removed. About 15 to 20

seconds of slow speed (about 50 RPM's) should do it. Move the stone up and down slightly to insure that you remove a uniform amount. Check your progress by inserting the piston and ring in the liner. You will notice a tightening as you move the piston up to top dead center. When you are satisfied with the results, clean everything in thinner and dry. Lay them aside for later assembly.

The shaft is next. You will need some Dykem blue or a marking pen. Color the shaft on the closing side for about 1/4" around the edge. The timing is to be set to close at 64 degrees after top dead center (TDC). You can either do this with a degree wheel setup or measure over from the outside closing edge of the port .100". Take the Dremel with the carbide cutter and cut the port out to this mark. Do not round this edge. It is needed to maintain an even cut off of fuel during running. Remove all burrs and clean up the cut opening with a stone or emery paper.

The shaft bore is left stock. There might be some improvement of performance to be had here, but I haven't found it yet.

Be sure there are no grooves or burrs on the crank pin. Polish the pin with ~~cus~~ cloth and oil or very fine wet or dry sandpaper.

The thrust bearing in the front end is rough from the factory. Take some 600 grit wet or dry sandpaper and place on a sheet of glass. Face off the brass bearing surface by rubbing it on the sandpaper sprayed with light oil. Use a figure 8 motion with light pressure to insure even removal. You don't have to remove a lot, just so the surface is fairly uniform.

Now take some polishing compound and smear a little on the shaft where the counter weight rides on the brass bearing. Rotate the shaft while holding it tight to the bearing. Stop frequently and check your progress. You should be able to turn the shaft in the front end (when clean and dry) and not feel any glitches. If you are not satisfied, do it some more. My best shaft and front end would spin and stop with the counterweight at the bottom everytime. When satisfied, clean thoroughly and lay aside.

The case is used basically stock. The small ridge on the intake side is removed for a better fuel passage. Smooth with fine paper.

The backplate is run totally stock. Lap the backplate and front end to the case using polishing compound. I know there are gaskets, but there is no use relying on them too heavily.

The head should be lapped to the liner for the same reason. The closer the fit the less chance of blowing a gasket.

The liner should fit snugly in the case, but not too tight. You should be able to remove it by putting a finger inside and turning while pulling up. If it is too tight, put a little polishing compound on it and lap it to the case. Be careful! It doesn't take much.

Now begin assembling the engine. Insert the piston (with ring and conrad attached) into the liner, being careful not to snag the ring. Insert the liner in the case being sure the exhaust ports and piston baffle are in correct positions. Bolt the front end assembly and backplate onto the case. Don't forget the gaskets. Now bolt the head (with gasket) into place. I use a cross torquing sequence to bolt my heads on. Alternate bolts and tighten just a little each time. Check the fit by turning the shaft. If things don't feel right, loosen the bolts and start again. I have taken as much as an hour to tighten and retighten a stubborn head.

All that is left to modify is the spraybar and venturi insert.

The spraybar and needle valve I use is from a Veco .19. The spraybar is turned down another .010 from stock. This can be done with an electric drill and file. Add another outlet hole in the spraybar about 30 degrees from the stock hole, using a drill the same size as the factory hole. The needle valve assemble is mounted in the venturi with both holes out of sight.

The venturi insert is bored out with an 11/32 drill and reshaped to its original flare. If you don't have a lathe, this can be done with an electric

drill and an Xacto knife if you are careful. Polish the inside to a mirror finish.

Now mount a propeller on the engine. Being sure to get the shim and tapered adapter in place properly. Crank the prop on tightly and check for end play in the shaft. There should be no more than .015. If there is excessive end play add shims to get it down to less than .015. Flip the prop smartly. You should feel the beginnings of compressions.

The breakin is the second most important part of the procedure. A good engine can be ruined by too short of a breakin. I usually run my engines rich for about an hour. (2 to 3 minutes at a time.) Gradually increase the RPM's toward the end of this hour. I use 10% nitro and an 8/8 prop right form the start.

There are times when no matter how careful you are, the ring will not seat. I have found that the compression should rapidly increase after the first several runs. If it doesn't show any increase after 5 to 8 minutes of running, chances are it never will seat properly. The only thing to do then is to go back and fit another ring and liner. Hard to do, but necessary if you are to have an engine that will run fast and restart.

Well that concludes the rework. If you have any questions or ideas, let me know. My address is:

Dave Green
200 W. Franklin
Astoria, OR 97103
(503-325-7005)

HAPPY FLIPPING!

NORTHWEST COMPETITION STANDINGS

NORTHWEST CL COMPETITION STANDINGS, AS OF MARCH 31, 1987

NORTHWEST SPORT RACE

(36 entries, 4 contests)
1. Dave Green 22
2. Jim Cameron. . . . 17
3. Bob Danielson. . . . 17
4. SHT Team 15
 Dick Peterson. . . . 15

NORTHWEST SUPER SPORT RACE

(38 entries, 4 contests)
1. Dave Green 21
2. SHT Team 16
 John Hall. . . . 16
4. S&S Racing Team. . 15
 Dave Gardner 15

PRECISION AEROBATICS

(16 entries, 1 contest)
1. Randy Schultz. . . . 16
2. Dave Mullens 15
3. George Mickey. . . . 14
4. Jason Huntress . . . 13

OVERALL RACING

(83 entries, 10 contests)
1. Dave Green 48
2. SHT Team 35
3. Bob Danielson. . . . 28
4. Jim Cameron. . . . 20
 Dick Peterson. . . . 20

BALLOON BUST

(16 entries, 1 contest)
1. Dave Mullens 16
2. George Mickey. . . . 15
3. Glenn Salter 14
4. Bob Danielson. . . . 13

GOODYEAR

(5 entries, 1 contest)
1. Dave Green.....5
2. SHT.....4
3. Jim Cameron.....3
4. Dick McConnell.....2

Contests counted in the above include: Drizzle Circuit 2, 3, 4, Skyriders 3 X 1, VGMC racing series #1. Combat was included at two of the DC meets, but the results haven't come through. Will include in the next update.

THE FLYING FLEA MARKET

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FOR SALE: Midwest kits; ME-109 .15 \$15, (2) P-51 Mustang .15 \$20, Sterling Ringmaster Jr. \$12, Mustang S-2 \$20, Monocoupe \$15, Waco Sre \$15, Goldberg Voodoo partially built \$5, Top Flite Combat Streak \$15, Sharpshooter P-51 \$35, Guillows stick-tissue Stearman & Cessna \$5
Engines: OS 15 nib 2 @\$20, OS 20 \$25, OS 30 nib 2 @ \$25, OS 35 nib \$35, Enya 19 nib \$25, Enya 29 nib \$30, Fox 35 nib \$25, Fox 45 new \$15, Super Tigre 60 nib 2 @ \$75 one soldering gun \$5
Please add \$2.50 to cover shipping excess will be refunded. Call or write: Gerald Schamp, 931 SW Calapooia, Albany, OR 97321 (503) 928-0430

FOR SALE: Flying Lines back issues. Fill in the gaps of your FL library. Singles \$1 each. Four or more @ 50¢. Issues available:

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NW COMPETITION RECORDS

RECORD PERFORMANCES ESTABLISHED BETWEEN NORTHWEST MODELERS IN SANCTIONED COMPETITION

The only new Northwest control-line competition record set in the winter of 1986-87 has been the Northwest Super Sport feature race record -- and Dave Green returned to the top of the heap.

Green, of Astoria, Ore., turned a 7:09 feature in the Jan. 11 Northwest Sport Race Drizzle Circuit race at Delta Park in Portland. The performance erased the 7:44 feature race record held by John Thompson.

Here are the complete records as of March 16:

MOUSE RACE I	50-lap: 2:52 (Mike Hazel)	100-lap: 6:33 (Mike Hazel)
MOUSE RACE II	75-lap: 3:40 (Dave Green)	200-lap: 11:49 (Dave Green)
GOODYEAR	70-lap: 4:22 (Clarence Bull)	140-lap: 9:02 (Clarence Bull)
SLOW RAT	70-lap: 3:56 (Dave Green)	140-lap: 7:14 (Dave Green)
RAT RACE	70-lap: 2:40 (Dick Salter)	140-lap: 5:46 (Dick Salter)
TEAM RACE	100-lap: 3:48 (Knoppi-McCollum)	200-lap: 7:49 (Knoppi-McCollum)
NW SPORT RACE	70-lap: 4:03 (H. Hadjik)	140-lap: 7:47 (Henry Hadjik)
NW SUPER SPORT	70-lap: 3:14 (Dave Green)	140-lap: 7:09 (Dave Green)
1/2-A SPEED:	88.2 mph (Paul Wallace)	FAI SPEED: 172.33 (C. Schuette)
1/2-A PROTO:	83.63 (Paul Wallace)	FORMULA 21: 79.54 (Rich Salter)
A SPEED:	181.56 (Chris Sackett)	FORMULA 40: 154.84 (Dick Peterson)
B SPEED:	187.66 (Chris Sackett)	JET SPEED: 194.73 (Chris Sackett)
D SPEED:	172.68 (Loren Howard)	PROFILE NAVY CARRIER: 232.5 (Bob Parker)
		CLASS I NAVY CARRIER: 318.3 (Roy Beers)
		CLASS II NAVY CARRIER: 324.3 (W. Spears)

UPDATE!!! Dave Green did himself one better, and lowered the NWSSR record to 7:03. This was accomplished at the March Drizzle Circuit.

Here's a special repeat feature, as was promised back in issue number 75. This is a special listing of "Regionals Records". This is an opportunity for our non-NW competitor friends to get their names on the record rolls. Good luck to all at the upcoming Regionals!

Profile Carrier-	Bob Parker, Renton Washington	226.3	(1986)
Class I Carrier-	Bob Danielson, Bothell, Wash.	300.3	(1984)
Class II Carrier-	Wayne Spears, Portland, Oregon	324.3	(1986)
1/2 A Speed-	Dave Williams, Yorba Linda, California	128.43	(1985)
A Speed-	Frank Hunt, Merced, California	171.20	(1985)
B Speed-	Frank Hunt, Merced, California	187.87	(1986)
D Speed-	Frank Hunt, Merced, California	191.41	(1981)
Jet Speed-	Chris Sackett, Burnaby, B.C.	192.64	(1982)
F40 Speed-	John Boles, Salt Lake City, Utah	152.09	(1985)
FAI Speed-	Chuck Schuette, Vancouver, Washington	157.87	(1986)
Slow Rat-	Vic Garner, Livermore, California	6:31	(1984)
Fast Rat-	Paul Gibeault, Calgary, Alberta	6:31	(1986)
Goodyear-	Paul Gibeault, Calgary, Alberta	7:55	(1986)
Mouse I-	Bob Boling, Richmond, California	4:52	(1986)
Mouse II-	Bob Boling, Richmond, California	10:52	(1986)
NW Sport Race-	Mel Lyne, Garibaldi Highlands, B.C.	9:06	(1986)
NW Super Sport-	S&S Team, Seattle, Washington	8:05	(1986)

V.G.M.C. SPORT RACE RESULTS

March 15 at Richmond Field

NORTHWEST SPORT RACE (9)

1) BRUCE DUNCAN	4:26	Pass	8:47
2) MARTY HIGGS	4:15	pass	9:22
3) RON SALO	4:30	Pass	10:39
4) AL RESINGER	4:39	4:59	N/T
5) DICK McCONNELL	4:51	DNF	
6) BOB DANIELSON	4:52	4:55	
7) PAUL DRANFIELD	5:45	5:30	
8) FRANK BODEN	D/Q	DNF	

15 SPORT RACE (4)

1) HENRY HAJDIK	5:59	11:32
2) DICK McCONNELL	6:07	12:03
3) BOB DANIELSON	-	13:07
4) FRANK BODEN	6:06	13:33



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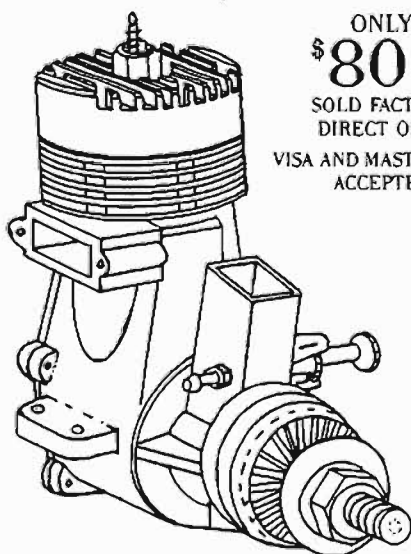
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NORTHWEST REGIONALS

87

CONTROL LINE MODEL AIRCRAFT CHAMPIONSHIPS

MAY 22-23-24

EUGENE . OREGON

events: COMBAT

RACING

AEROBATICS

SPEED

SCALE

CARRIER

BALLOON BUST

AMA "AAA" SANCTIONED

\$ 2,000 of awards



NORTHWEST REGIONALS 87 SCHEDULE & INFORMATION

FRIDAY Speed: ½A, A, B, D, Jet, FAI, Formula 40.....12:00 - 6:00

SATURDAY

Profile Carrier.....9:00 - 5:00
 Class I Carrier.....9:00 - 5:00
 Class II Carrier.....9:00 - 5:00
 Mouse Race I (sr-op)....9:00
 Old Time Stunt.....10:00
 Mouse Race I (jr).....10:30
 Mouse Race II.....11:00
 AMA Slow Combat.....11:00
 Goodyear.....12:00
 FAI Combat.....1:00
 Profile Scale.....1:00
 AMA Rat Race.....1:30
 AMA Slow Rat Race.....2:30
 NW Super Sport Race.....4:00

SUNDAY

Speed.....8:00 - 12:00
 &
 1:00 - 5:00
 NW Sport Race (sr-op).....9:00
 Precision Aerobatics.....9:30 - 5:00
 AMA ½A Combat.....10:00
 NW Sport Race (jr).....11:00
 AMA Precision Scale.....12:00 - 1:00
 AMA Fast Combat.....12:00
 Balloon Bust (jr).....1:00 - 5:00
 Balloon Bust (sr-op).....1:00 - 5:00
 Awards Presentation.....5:15

SCHEDULE NOTES

- * Registration is open from 8AM to Noon on Saturday and Sunday. Friday speed entrants are to register with the event director.
- * Event starting times will be held to close as possible.
- * Stunt and Scale entrants should check at registration regarding any special meeting or judging times.

EVENT & RULES INFORMATION

- * AMA events are per current 86-87 rule book....Know the rules!!!!!!!
- * NW Sport Race: Fox 35 Stunt-no mods, stock profile kit planes or exact duplicates, single wheel landing gear OK, no shutoff, no fastfill, no hot glove, suction feed.
- * NW Super Sport Race: Plain bearing single bypass .36 maximum, AMA Slow Rat plane specs with outboard suction tank. Both NW events use .018 x 60 multi-strand lines, and supplied 10% nitro fuel. Write contest director for full rules.
- * Profile Scale: profile fuselage only, must represent actual plane. One entry per individual, documentation required. Write contest director for full rules.
- * All Combat events except ½A are flown double elimination.
- * Precision Aerobatics is flown in all four PAMPA classes.
- * Events flown over grass circles: Precision Aerobatics, Old Time Stunt, NW Sport Race, Combat, Carrier, Balloon Bust, Profile Scale.

OTHER INFORMATION

- * Contest site: Mahlon Sweet Airport (municipal) Eugene, Oregon
- * Facilities: Overnight camping on the site is OK. Get directions at registration for parking or tent site. Restrooms will be on the site. A concession truck will be at the site most of Sat & Sun. There are additional facilities in the airport terminal building. Write to contest director for city map and motel directory.
- * AMA or MAAC membership is required of all participants, this includes mechanics. AMA membership is available at registration.
- * Only participants and officials are allowed in the flying areas.
- * No alcoholic beverages allowed on the flying field during meet hours.
- * Absolutely no parking on gravel areas in front of fenced fuel depots.
- * Awards: Trophies and merchandise thru third place in each event.

Contest Director: Dave Green, 200 W. Franklin, Astoria, Oregon 97103
 phone (503) 325-7005

NORTHWEST 1987 CONTROL LINE SCHEDULE

APRIL 12 -----PORTLAND, OREGON-----

Drizzle Circuit Number 5
 Events: AMA Rat Race, NW Sport Race,
 NW Super Sport Race. Season awards
 presented. Site: Delta Park
 CD: Wayne Spears, 7454 N. Burr,
 Portland, OR 97203

APRIL 12 -----RICHMOND, BRITISH COLUMBIA----

VGMC Sport Racing Series #2
 Events: NW Sport Race, 15 Sport Race
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Henry Hajdik,
 1629 London St., New Westminster, B.C.,
 Canada V3M 3C8 (604) 526-9554

MAY 2 -----SEATTLE, WASHINGTON-----

Skyraider's Spring Tune-Up
 Events: FoxDoo Combat, Profile Carrier,
 Class I & II Carrier- record ratio
 Site: Carkeek Park Sponsor: Seattle
 Skyriders CD: Dan Cronyn, 9028 7th NW,
 Seattle, WA 98117 (206) 782-5552

MAY 17 -----RICHMOND, BRITISH COLUMBIA----

Spring Ukie Tune-Up
 Events: NW Sport Race, 15 Combat,
 sport events- 33-1/3, Snapper
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Henry Hajdik
 1629 London St., New Westminster, B.C.,
 Canada, V3M 3C8 (604) 526-9554

MAY 22-24 ----EUGENE, OREGON-----

NW Control Line Regional Championships
 Events: Combat: 1/2A, Slow, Fast, FAI
 Carrier, Class I, Class II, Profile
 Speed: 1/2A, A, B, D, Jet, FAI, Form 40
 Racing: Mouse I, Mouse II, Goodyear,
 AMA Rat Race, AMA Slow Rat, NW Sport
 Race, NW Super Sport Race.
 Profile Scale, AMA Precision Scale.
 Precision Aerobatics (four PAMPA classes)
 Old Time Stunt, Balloon Bust.
 Site: Eugene Airport CD: Dave Green,
 200 W. Franklin, Astoria, OR 97103
 (503) 325-7005 Sponsor: Eugene
 Propspinners.

JUNE 14 -----ASTORIA, OREGON-----

Clambash 1987
 Events: NW Sport Race, NW Super Sport,
 1/2A Combat, Fast Combat, Clam Scale,
 Precision Aerobatics, Profile Carrier,
 Class I Carrier, Class II Carrier.
 Site: to be announced. Sponsor:
 North Coast C.L.A.M.S. CD: Dave Green,
 200 W. Franklin, Astoria, OR 97103
 (503) 325-7005

JUNE 14 -----RICHMOND, BRITISH COLUMBIA----

VGMC Sport Racing Series #3
 Events: NW Sport Race, 15 Sport Race
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Henry Hajdik,
 1629 London St., New Westminster, B.C.
 Canada V3M 3C8 (604) 526-9554

JUNE 20-21 ----RICHMOND, BRITISH COLUMBIA-----

Northwest CL Speed Championships
 Events: All classes CL Speed
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Henry Hajdik,
 1629 London St., New Westminster, B.C.
 Canada V3M 3C8 (604) 526-9554

JUNE 27-28 ----KENT, WASHINGTON-----

Bladder Grabber
 Events: AMA Fast Combat (triple elims)
 \$7,000 in prizes. Site: Boeing Space
 Center- Kent. Sponsor: Carver Corp.
 CD: Howard Rush, 14321 SE 63rd St.,
 Bellevue, WA 98006

JULY 11-19 ----LINCOLN, NEBRASKA-----

1987 AMA Nationals
 For info send SASE to: Academy of Model
 Aeronautics, 1810 Samuel Morse Drive,
 Reston, VA 22090
 Advance entry deadline: June 26

AUGUST 2 -----RICHMOND, BRITISH COLUMBIA-----

VGMC Sport Racing Series #4
 Events: NW Sport Race, 15 Sport Race
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Henry Hajdik,
 1629 London St., New Westminster, B.C.,
 Canada, V3M 3C8 (604) 526-9554

AUGUST 15-16---KENT, WASHINGTON-----

Rapid Richard's Record Ratio Meet
 Events: All classes of Speed, Carrier
 Class I, Carrier Class II, and AMA
 Endurance. Site: Boeing Space Center
 Sponsor: Dick Peterson, Po Box 78388,
 Seattle, WA 98178

SEPT 5-6 -----RICHMOND, BRITISH COLUMBIA----

43rd VGMC Internats
 Events: Precision Aerobatics (2 classes)
 15 Combat, Balloon Bust, 15 Sport Race,
 NW Sport Race, Record Ratio Speed,
 Profile Carrier, Class I & II Carrier
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Chris Sackett,
 Box 82294, North Burnaby, B.C. Canada
 V5C 5P7 (604) 299-4500

SEPT 19-20.---KENT, WASHINGTON-----

Washington State Championships
 Events: Combat: 1/2A, AMA Slow, AMA Fast,
 Racing: Mouse I, Mouse II, NW Sport
 Race, NW Super Sport Race, Sport Gdyr.
 Carrier, Profile, Class I & II
 Profile Scale, Sport Scale, Balloon Bust,
 Precision Aerobatics (4 PAMPA classes)
 Old Time Stunt, Record Ratio Speed
 Site: Boeing Space Center- Kent
 Sponsor: Seattle Skyriders
 CD: to be announced Skyraider contact:
 15559 Palatine Ave N. Seattle, WA 98133

OCT 4 -----RICHMOND, BRITISH COLUMBIA----

VGMC Sport Racing Grand Finale
 Event: NW Sport Race
 Site: Richmond field Sponsor: Vancouver
 Gas Model Club CD: Henry Hajdik,
 1629 London St., New Westminster, B.C.,
 Canada, V3M 3C8 (604) 526-9554

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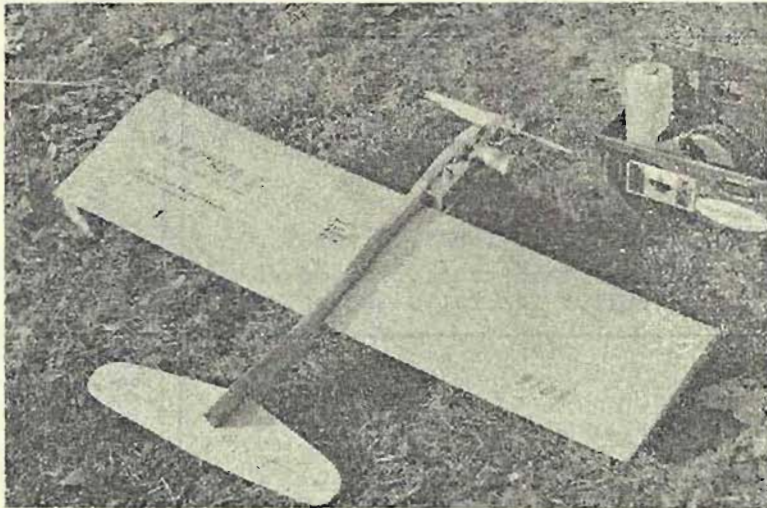
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APR	4-5	12	19	26	
	TRIP. ELIM. FAST COMBAT BIG BUCKS SITE: WN	PALM SUNDAY	EASTER SUNDAY	TULSON (WN CLOSED) SEE NOTES	
MAY	3	10	17	23-24-28	31
	MILE SQ ALL ELECTRICAL SCALE-STUNT- SPEED	MOTHERS DAY		TRIPLE A EUGENE, ORE.	(WN CLOSED)
JUN	7	14	21	28	
		SEE NOTES SITE: WN	FATHERS DAY		
JUL	4-5-6	12	19	26	
	INDEPENDANCE DAY WEEKEND	NATS LINCOLN, NEBRASKA			
AUG	2	9	16	23	29-30
	NG		SEE NOTES SITE: WN	(WN CLOSED)	FAI SPEED-TEAM RACE TRIALS SITE: WN
SEP	5-6-7	12-13	20	27	
	SITE: BASIN SITE: MERCED SEE NOTES	TULSON SEE NOTES	(WN CLOSED)	NG	
OCT	4	11	18	25	
		(WN CLOSED)	TRIPLE A SEE NOTES SITE: WN		
NOV	1	8	15	22	29
		(WN CLOSED)			THANKSGIVING DAY WEEKEND

NOTES:

- 3-15 MERCED - SPEED % OF RECORD
 RACING: MOUSE I - NORTHWEST SPORTRACE - RAT -
 SLOW RAT - RACING SCALE (15)
- { 4-25, 26 } TULSON - MOUSE I & II, RACING SCALE, FORMULA UNLIMITED,
 { 9-12, 13 } ACLA SLD RAT, AMA RAT, 1/2 A - SLD-FAST COMBAT,
 AMA SPORT SCALE, ALL CARRIER, PAMPA STUNT-BEGIN-
 INTERMEDIATE-ADVANCED
- 6-14 ALL CARRIER, NOVICE & ADVANCED STUNT, SPEED % OF
 RECORD, SUPER SLOW COMBAT
- 8-16 AMA DIVE BOMBING AND STRAFING, TEXAS DUCKIE RAT,
 RACING SCALE, FORMULA UNLIMITED, SPEED % OF RECORD
- 9-6 BASIN: 1/2 A MULTI ENGINE PROFILE SCALE, ELECTRIC SCALE,
 AMA SPORT SCALE
- 9-5 & 6 MERCED SPEED % OF RECORD ALL AMA RACING PLUS
 NORTHWEST SPORTRACE & SUPER SPORTRACE
- 10-15 & 16 ALL STUNT, ALL CARRIER, ALL SPEED (% OF RECORD),
 ALL RACING PLUS NORTHWEST SPORTRACE AND
 FORMULA UNLIMITED, AMA SPORT SCALE
- SPECIAL-NOTE: FAI MEETING TO DISCUSS TEAM TRIALS. MEET
 AT KOB MFG CO., 12152 WOODRUFF AVE., DOWNEY, CA.
 7:00 PM

February Drizzle Circuit scenes, captured by Jim Cameron



Green's winning "Minotaur".
Holds current NWSSR record.



Bill Varner gets his TeeDee
to talk. Dave Green holds.



Dick and Rich Salter work on
 $\frac{1}{2}$ A combat entry.



Jim Cameron's Yak-9 NW Sport
Racer.



Two big guys, one small plane.
Glenn and Dick Salter.



"Dr. Bob" Danielson, the well
dressed pitman.

FLYING LINES is produced ten times a year by a dedicated staff of volunteers interested in keeping lines of communication open between Northwest control line modelers. FL is totally independent of any organization, depending entirely upon support from subscribers, advertisers, and donors.

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