

**From: National Control Line Racing Association
Bill Bischoff 1809 Melody Ln.
Garland, TX 75042**



TO



**Look inside for the final installment of the Bill Bischoff
Quickie Rat Article.**

INSIDE:

**District Reports
Quickie Rat Article Pt. 3
Fora Sport Goodyear Engine
Plum Crazy Sport Goodyear
Suppliers/Equipment
Updated Contest Calendar**

**Torque Roll Issue #173
April 2024**

PRESIDENT – Bill Bischoff

News from Muncie

The 2024 CL World Champs will go on as planned! "Well, why wouldn't they?", you may ask. That's a good question. Besides the fact that AMA had said from the beginning that they would provide no financial support, in January, AMA dropped a bomb on Bill Lee. They told him they would be providing only minimal support from AMA staff, in spite of an existing "separation of responsibilities" document that was being followed at that time and which had been in place for several previous World Championships at AMA. Nice, thanks.

As it turns out, there is a provision in the FAI rules that allows the contest to be cancelled if it is not financially viable. There was an early entry deadline of Feb 28. (Early entry is really just a country's declaration of intent to entry. No money has changed hands yet.) Once entry numbers were set, there was about two weeks to analyze the finances and make the decision if it was doable or not. Even with lots of last-minute entries, the budget was still technically a bit in the red, but we decided to go for it anyway. We still need workers, so be sure to reread that document elsewhere in the newsletter.

In other news, AMA is planning major renovations to the International Aeromodelling Center in 2025. The speed and racing sites will be dug up, and replaced with three new paved circles near the current racing site. We will share a common practice circle in the center, with racing on one end and speed on the other. This will be much better for those contestants flying both events. What it also means is that repairs to the sites for 2024 will be nothing more than minimal "band aids", just to get through the WC's. Sorry, racers. Looks like we'll have to tough it out one more year. Hopefully, the new facilities will be worth the wait.

NATS entry is open, but I have been having a hard time getting the daily racing event schedule listed correctly on the AMA's Calendar. Regardless, the schedule will be:

Sunday 8/4: Mouse I, AMA Goodyear, and Clown.

Monday, 8/5: AMA Slow Rat, DMAA Sport Goodyear

Tuesday, 8/6: Quickie Rat, Super Slow Rat

Officer Nominations

Starting now, we are accepting nominations for NCLRA President, Vice President, Secretary and Treasurer. The current officers have all selflessly (or foolishly) volunteered for another term, but nominations are welcome. If nominating someone besides yourself, please get their consent first. A ballot will be in the next newsletter. Technically, only current members may vote. Current or not, please vote, and if you want to get current on your membership, that would be OK, too.

NORTH WEST – Leighton Mangels

First off, a note from John Thompson:

Attached is a press release and contest flyer with information about the 51st Northwest Control-Line Regionals.

We'll gladly answer any questions about the event you may have. You can contact me at johnnt4051@aol.com or Contest Director Mike Hazel at zzclspeed@aol.com.

John Thompson, assistant contest director
Northwest Control-Line Regionals
[Flying Lines — News of Northwest Control-Line Model Aviation](#)

Good news and bad news. In this day and age it's always good news when more people are interested in getting into control line racing. Here in the Northwest, we've had several new flyers getting into racing over the past couple years which is indeed good news but, unfortunately, they aren't all experienced in racing which can be bad news. We've tried to spend some practice time with some of them but they are in various locations and it's not possible. The problems vary from not getting into the center of the circle quickly to flying too high to pivoting in the center instead of walking a circle, etc. It's difficult to get new racers but having them show up at a contest without the racing experience can be problematic. We'd be interested in anybody's suggestions as to the best way to deal with this. We want new racers but contests aren't the best venue for training.

Speaking of contests, our club, the Northwest Fireballs, is having our first contest of the year in a couple weeks on April 26, 27, and 28 at our field at Delta Park in Portland. All the racing will be on Friday the 26th. About a month later is the Northwest Regionals in Roseburg Oregon and it's the biggest control line contest in the NW so if you want to visit the Northwest this is a great opportunity. The specifics for both contests are listed in Flying Lines. I hope everyone has a fun filled 2024.

Leighton Mangels

NORTH CENTRAL – Paul Gibeault

**** NOTE from Bill Lee: One item that is on the to-do list is lining up someone to do event coverage for *Model Aviation*. As you may know, I have done this for some World Championships I have attended, but certainly no time this time around.**

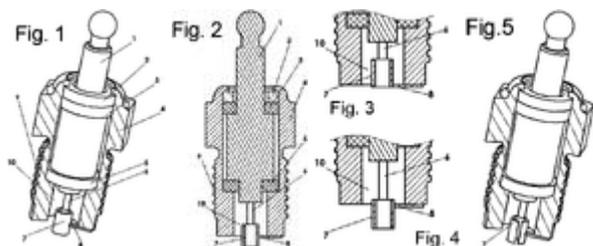
Now I have the pleasure of telling you that Paul Gibeault has stepped forward and volunteered to be our "Media Focus". Paul will be searching out people to do reporting on various parts of the event, will work with *Model Aviation* to get things submitted and published, to see that the compensation from *Model Aviation* for submitted articles is done, etc. In order to do this, Paul will be contacting you to get ideas and, possibly, names, make plans, and so forth. If you have ideas or other input, please contact Paul directly at: pgibeault@shaw.ca

New glow plug development out of Germany

Combat flier Rafael Unruh has developed what he calls his Rafaeltube plugs. I can't figure out how to copy all his plug info here, but below is his link. This abstract from the actual patent is found along with other well known glow plug patent holders like Irwin Ohlsson & Steve O'Donnell.

Translated from German

The present invention relates to a glow plug having a tube-shaped glow igniter element for promoting ignition and combustion of an air-fuel mixture in an internal combustion engine. These internal combustion engines are used in aircraft, car and ship model construction. The glow plug for model engines has at least one threaded (9) plug housing (4) in which there are two electrically insulating sealing rings (3; 5), a retaining ring (2) and a rolled-up center electrode (1). The center electrode (1) and spark plug housing (4) contact a glow igniter element in tube form (7) with the aid of at least one connecting electrode at the top (6) and at least one connecting electrode at the bottom (8). The glow igniter element in the form of a tube (7) is placed concentrically in the candle housing space (10).



[https://www.facebook.com/reel/1108220137200973/?s=single_unit&__cft__\[0\]=AZUYKRdSs_VRLMIBa5TtBfpLPEgRyksKHdJdFIV4D6eGe7dSmzxfGxjDWvfqw94J3WymjZMFweMsoUiB0NfwCgVnntu7TI9ejGnClCeN_u5UKRpEvmfmyrDxi0XSUSkO1XYJbWPYN3wFYNCiB_rcLUDRAO1WRIfxDqzoA7vUfhYlkw&__tn__=H-R](https://www.facebook.com/reel/1108220137200973/?s=single_unit&__cft__[0]=AZUYKRdSs_VRLMIBa5TtBfpLPEgRyksKHdJdFIV4D6eGe7dSmzxfGxjDWvfqw94J3WymjZMFweMsoUiB0NfwCgVnntu7TI9ejGnClCeN_u5UKRpEvmfmyrDxi0XSUSkO1XYJbWPYN3wFYNCiB_rcLUDRAO1WRIfxDqzoA7vUfhYlkw&__tn__=H-R)

The advantage of this new style plug is much greater longevity and higher power engine output. The disadvantage is these plugs sell for 35 Euro's each and the current element runs in the cold heat range.

At present the only body thread size available is the Nelson 11-32 X 32. Also, regular glow battery systems don't work so this plug needs its own special glow ignition system which you can also buy from the manufacturer. So far, I've only heard from a few pylon racers that have used the system, with varying results.

Test results, settings, experiences



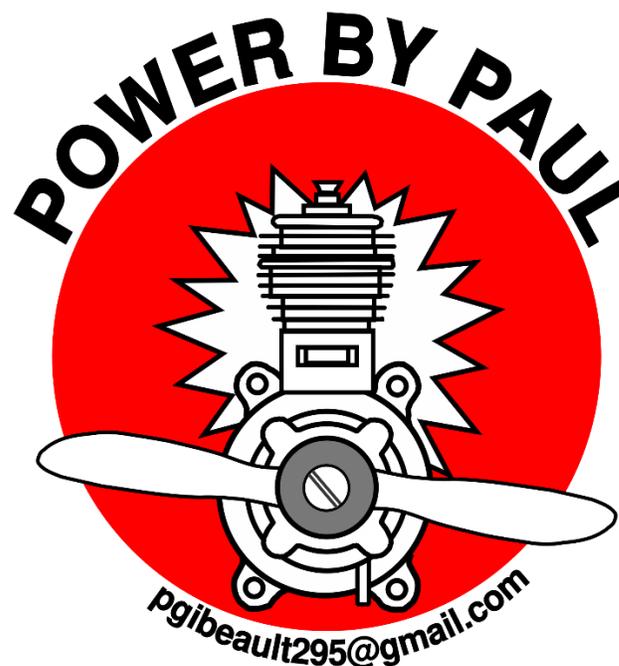
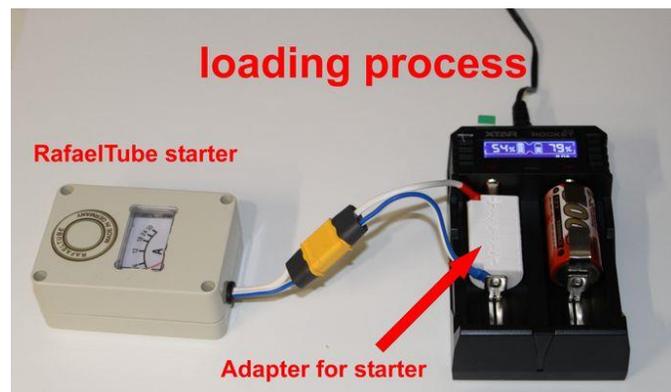
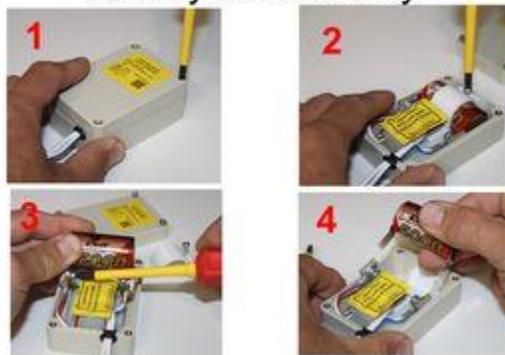
more RPM on the ground 400-1000 RPM and much more RPM in the air depending on engine and engine settings.

more RPM stability in flight maneuvers

more compression possible for more power without limitation.

Multiple lifetime compared to standard glow plug

Battery disassembly



Official sponsor of the 2024 World C/L Championships

NORTH EAST – Tom Schaeffer

I really have nothing from the district...but. I still have several K&B .40's that have been prepped for racing as well as a few 5.8's. They are available at very reasonable prices. I am also planning to make the scene at the Dallas meet in April and will report on how that goes. We will have the potential to race the vintage B-TR's.

C. T. Schaefer

SOUTH EAST – Bob Whitney

Time fly's when you are having fun. It looks like the summer is going to be a big one with three different contests back-to-back, plus scale being run in July. If you can't get your fill of model airplanes with this schedule, then there is no hope. We have two chances to watch some of the top F2C teams competing against each other and our guys are going to have a long row to hoe with very little practice time leading up to the WC's...maybe they can get some flights in the World Cup. I have volunteered to help with scale and F2C, I have new battery's in both my stop watch's!
The Nat's should be a mixed bag with less and less pilots being able to keep up with today's speeds.
Anyway, come on out and enjoy a great two weeks. We'll see you there.

RAD

SOUTH CENTRAL – Bill Bischoff

Our first contest of the season in Dallas is almost upon us. The flyer is included in this newsletter. In response to interest shown by some out-of-towners, we will be adding Dayton Vintage B Team Race on Friday afternoon. I for one am looking forward to it. As I said at last year's NATS, it's maximum smiles per gallon. If you've got one, why not join us?

The full schedule of Dallas Racing events for 2024 was listed in the Feb 2024 *Torque Roll*.

WE STILL NEED YOUR HELP!

2024 F2 WORLD CHAMPIONSHIPS WORKER INFORMATION- F2C Team Racing

The 2024 F2 World Championships cannot happen without a sizeable staff of workers. This information is prepared for all persons interested in helping with the F2C Team Racing event.

Schedule for August 2024

The 2024 NATS CL Racing events are scheduled for Sunday, Aug. 4 -Tuesday, Aug. 6. No racing events are scheduled for

Wednesday, Aug. 7. This will be the preparation day for the "Doc" Jackson World Cup event on Thursday 8/8- Friday 8/9. Saturday 8/10 will be the preparation day for the World Championships. Contestants will arrive and register on Sunday 8/11. Model processing and official practice will be Monday 8/12. Qualifying races will on Tuesday, Wednesday, and Thursday. Semifinal races will be flown Friday and Saturday. The Final race will also be Saturday 8/17, as well as the closing ceremony and the evening's banquet.

We will need a firm commitment from workers, starting from Wednesday 8/7, and extending through Saturday, August 17. This is 11 full days. Yes, it's a long time, but that is what we must have in order to put on a World Championships in a professional manner. At this level of competition, the contestants deserve our best efforts, not to mention we will be representing the AMA and the United States of America.

We are seeking personnel for the following positions:

Timers

A total of nine timers are required, three for each team in the race. Each person will time and count laps for their assigned team. One timer for each team shall be the "lead timer". The lead timer's lap counter will be wired into the computerized scoring system. The lead timer will also be responsible for writing down the three stopwatch times for "his" team, and presenting them to the tabulator after the completion of each race.

Timers should have free time in the morning during the official scheduled practice.

Pit Boss

The two Pit Bosses will be responsible for measuring line length and diameter, inspecting the handle, lines, and safety thong for rule compliance, and pull testing the aircraft's control system and safety thong. They will also distribute the red, white, and smocks to the appropriate teams before each race, and collect them at the conclusion of each race. The Pit Bosses will also maintain an orderly flow of teams taking and leaving the circle.

Other responsibilities

There will be countless tasks, both big and small, that will need to be taken care of during the competition. All staff will be expected to help with model processing on Monday 8/12. This will include various measurements and inspections of the models, including measuring fuel capacity. We will need to put up the computerized lap counting and timing system every morning, and take it down and put it away each evening. During the course of the races, the judges may call for random technical checks of models, so we will need some people to be available to perform that function. There will likely be clerical and computer data entry needs. The point is that we will need people to help do whatever needs to be done, in addition to their "official" jobs.

Compensation

Workers for the above positions will receive financial compensation, plus a ticket to the banquet on Saturday 8/17. This amount is based on an estimate of the number of entrants, so it cannot be guaranteed at this time. It is intended for this number to be firm once entries have been received.

Sign Up

Anyone wishing to sign up should first contact F2C event Director Bill Bischoff by email at billbisch@hotmail.com. Thank you, and I'll see you in Muncie.

NEW ENGINE FOR DMAA SPORT GOODYEAR

We are exploring the Fora Jr 2.5 glow as a potential DMAA Sport Goodyear engine. If you are not familiar with it, it comes in both AAC and ABC versions. We have flown the ABC version, and frankly, the orange anodizing on the cylinder muff causes some glow plug continuity issues. The AAC version is not anodized. The stock venturi is a sprinkler type, with a 4mm bore. The mounting pattern is 13mm x 35 mm, which looks to be the same as Rossi/Supertigre. So far, we have tested exactly one engine on exactly one airframe. While by no means a representative sample, what we tried ran in the mid 21's for 8 laps, which is actually better than average for a Magnum/ ASP. We want to make sure these engines will be available in adequate quantities before making them legal, so we have ordered 20 engines from Fora. It is my idea that NCLRA will pay for them, and I will handle the distribution. Street price should be about \$120 each. This is quite reasonable, considering that the only other new engine available, the SH 15, is \$85, plus another \$26 for a venturi and NVA, plus \$10 more if you want to buy the machined down head clamp. I would set an initial limit of two engines per person.



As for making them legal, here is the plan: We would declare the *engines* to be legal, so that if somebody buys one, they know they will be able to use it. We declare the *stock venturi* "provisionally" legal for 2024, subject to size change for 2025. This way, we can get a bigger sampling of how the engine performs, and if it's too fast or too slow for our liking, we can adjust the venturi size without making the actual engine illegal. These engines would also be subject to the "external controls" requirement, like the Magnum/ASP/SH equipped airplanes.

Please note that this is all dependent on being able to get engines in a timely manner. If they aren't readily available to everyone who wants one, then we're not any better off than we are currently. Also note that this is just in the planning stage. No changes in the current DMAA Sportsman Goodyear rules have been enacted yet.

PLUM CRAZY

Here's the Plum Crazy from last time, all painted and pretty. She's already been given a new home by Richard Kucejko, just in time for the 2024 racing season. Best of luck to both of them!



NEW QUICKIE RAT

My new Quickie Rat is complete and has been test flown. As a tribute to the original Barracuda, which was finished in metallic blue Superpoxy, the new one was painted in the similar Chrysler color "Intense Blue Pearl". The big difference is that this time, the paint is "Perfect Match" automotive lacquer out of a spray can. KlassKote clear epoxy tops it off. There a few details I'd like to focus on, namely the exhaust priming system and the hot glove contacts. These topics have been examined before, but a little review doesn't hurt.



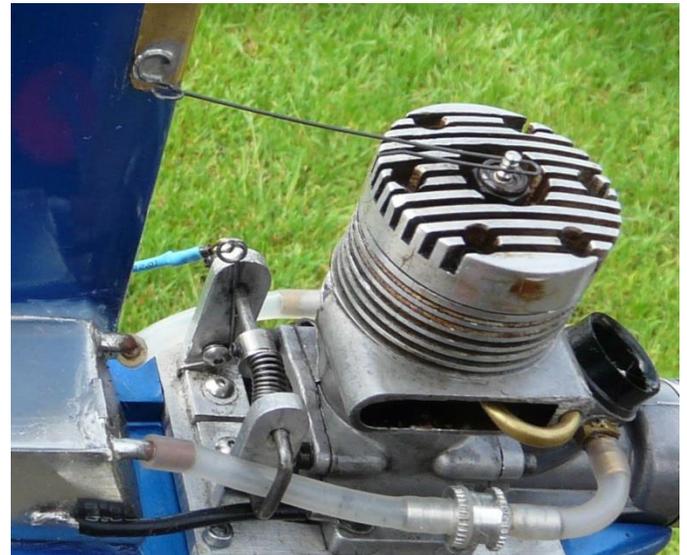
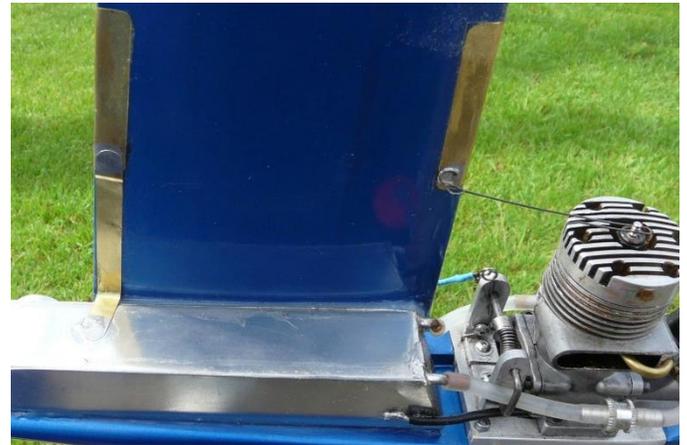
EXHAUST PRIMER

The vent/overflow on this tank is located in the top, front, outboard corner of the tank. It is connected to a fitting attached to a top engine mounting bolt. Since it is above and inboard of the tank, this prevents fuel from wanting to come out of the vent in flight. On my airplane, this fitting also features a tee connection for an exhaust primer. (A separate metal or plastic tee also works.) The exhaust primer is a simple piece of 1/8" brass or copper tubing, bent into a "J" shape. The short side fits up into the exhaust port, but doesn't touch the liner. The long side fits through one of the muffler mounting bosses, and is connected to the tee. When the tank is full, fuel is expelled through the vent, and some of it squirts into the exhaust. The amount of prime can be adjusted by squeezing the primer outlet with pliers, to reduce the size of the outlet. An examination of the photos should eliminate any confusion.



HOT GLOVE CONTACTS

Hot gloves are legal in Quickie Rat, and their use does speed up pit stops. For those unfamiliar with the concept, a hot glove eliminates the need to attach a battery clip to the glow plug for starting the engine. Instead, the airplane has electrical contact points mounted on it, which are connected to the glow plug post and the engine crankcase. The mechanic wears a "hot glove", which has battery contacts mounted to the underside of the thumb and middle finger. When the pitman grasps the airplane in a normal manner, the contacts on the glove touch the contacts on the airplane, and the battery is connected to the glow plug. The engine is started, and the airplane is released, disconnecting the battery. No fumbling or fiddling with glow clips, easily saving several seconds.



On a Quickie Rat, the preferred location for the contact points is on the leading and trailing edge of the wing as shown. The leading edge contact connects directly to the glow plug post, and the trailing edge contact connects to the engine crankcase, using the fuel tank as part of the circuit.

I made my wing contacts from K&S #258 .003 brass shim stock. They are 2" x 3/4" folded lengthwise around a piece of 1/16" music wire, and epoxied to the wing. The strip connecting the trailing edge contact to the tank is soldered at both ends, and attached with thin CA. At the front of the tank, a short piece of wire soldered to the tank has a ring terminal soldered to it, and is fastened to the engine with one of the lower mounting bolts. The leading edge contact is

connected to the glow plug with a piece of .025 music wire. The front is bent into a tight "U" shape which clips over the glow plug post. At the wing, the wire is bent into a one turn coil, allowing the wire to be moved out of the way when changing the plug. The wire then forms a horseshoe shape where it solders to the leading edge contact plate, and the tail end of the wire bends up into a small hole drilled into the wing. This is all in an effort to ensure a secure solder joint.

Another picture shows the hot glove in use. The construction of the hot glove itself was featured in the June and August 2023 issues of *Torque Roll*.

CONTEST CALENDAR

NCLRA cannot be held responsible for errors or omissions! This calendar is compiled from data collected at the NCLRA website nclra.org, and other published sources. Members can log in to NCLRA.org and submit contest details.

NORTHEAST DISTRICT

Middlesex

April 28 Speed & racing. (tentative)

May 19. Speed & racing. (tentative)

NORTH CENTRAL DISTRICT

None

NORTHWEST DISTRICT

Jim Walker Memorial Spring Tune Up.

April 26, 27, and 28 at Delta Park, Portland.

Put on by the NW Fireballs. All the racing will be on Friday the 26th.

NW Regionals

Roseburg Oregon on May 24, 25, and 26.

The racing will be on Friday the 24th.

Contact John Thompson at john4051@aol.com or Contest Director

Mike Hazel at zzclspeed@aol.com.

All our area contest dates and further info can be found on Flying Lines Website.

SOUTHEAST DISTRICT

None

MIDWEST DISTRICT

AMA Nats

The CL Nats for Speed, Racing, and Combat will be Sun, Aug 4 -Wed, Aug 7. The plan is for Mouse, Clown and AMA Goodyear on Sunday, Sport GY and AMA Slow Rat on Monday, and TQR and Super Slow Rat on Tuesday.

Stay tuned for further developments.

Laird "Doc" Jackson Memorial Aug. 8-9

World Cup USA, AMA Flying site

Events: F2 -ABCD

See <https://2024clwc.org/> for details.

FAI F2 World Championship Aug. 11-17

AMA flying site, Muncie Indiana. Events: F2-ABCD.

See <https://2024clwc.org/> for details.

SOUTH CENTRAL DISTRICT

The Dallas Model Aircraft Association contest schedule for 2024.

April 26-28 Spring Warm Up. Racing both days

June 8-9 Bob Gieseke Memorial. Racing Sat. only

August 31-Sept. 1 Charles Ash Memorial. Racing Sat. only

October 4-6 Fall Finale. Racing both days

Please contact me for details. I hope to see you there!

SOUTHWEST DISTRICT

TBD

NATIONAL RECORDS

SLOW RAT (.25 engine)

Op (70 laps) 3:01.52 Jim Gall/ Les Akre 7/04/11

(140 laps) 6:17.59 Russ Green/ Bill Lee 7/07/09

(no Jr or Sr record)

½ A MOUSE 1

Jr (50 Laps) 2:37.57 Scott Matson 7/15/99

(100 Laps) 5:17.68 Scott Matson 7/17/99

Sr (50 Laps) 2:44.68 Dave Rolley Jr 7/15/99

(100 Laps) 5:20.11 D.J. Parr 7/16/98

Op (50 Laps) 2:12.3 Jim Holland 7/16/04

(100 Laps) 4:22 Ryan & Gibeault 7/15/99

½ A MOUSE 2

Op (70 Laps) 3:01.24 MacCarthy/Kerr 7/11/03

(140 Laps) 6:18.13 Whitney/Hallas 7/10/09

SCALE RACING

Jr (70 Laps) 2:50.65 Bob Fogg III 7/16/91

(140 Laps) 6:08.55 Bob Fogg III 6/23/92

Sr (70 Laps) 3:15.12 Doug Short 7/11/00

(140 Laps) 5:40.05 Bob Fogg III 7/11/95

Op (70 Laps) 2:39.38 Willoughby/Oge 7/15/97

(140 Laps) 5:33.04 Bob Fogg Sr 7/16/91

F2C TEAM RACING

Op (100 Laps) 3:42 Fisher/Wilk 7/13/15

(200 Laps) 6:43.32 Fisher/Wilk 7/16/12

F2CN (NCLRA RULES)

100 Laps 4:14.84 Bill Lee/ Russ Green 7/07/11

200 Laps 8:37:10 Wallick/Brozo 7/15/13

NCLRA 'B' TEAM RACING

Op (35 Laps) 1:24.34 Burke/Duly 7/12/05

(70 Laps) 3:05.73 Green/Lee 7/10/09

(35+70 Laps) 4:33.91 Green/Lee 7/10/09

(140 Laps) 6:08.80 Green/Lee 7/10/09

RAT RACING (.15 RULE)

Op (70 Laps) 2:44.6 Jim Holland 7/15/04

(140 Laps) 5:33.1 Jim Holland 7/15/04

Jr-Sr No record established

NCLRA FOX RACE

Jr (100 Laps) 5:57.11 Scott Matson 7/11/99

Sr (100 Laps) 5:28.09 Scott Matson 7/16/02

Op (100 Laps) 5:32.55 Tim Stone/Bob Oge 7/10/05

NCLRA CLOWN RACE

Op (7 ½ Min.) 150 Laps Bischoff/ Lee 7/15/15

Op (15 Min.) 284 Laps Bischoff/Lee 7/15/15

NCLRA TEXAS QUICKIE RAT

(70 Laps) 2:58:72 Bill Lee/Bill Bischoff 7/18/13

(140 Laps) 6:07.01 John McCollum/Bill Lee 7/14/05

NCLRA SUPER SLOW RAT

(100 Laps) 5:14.30 Bill Lee/Russ Green 7/05/09

DMAA Spring Warm-up
Gene Hempel Memorial
April 26, 27 & 28 - 2024
Control Line Racing and Speed
Site: Samuell Garland Park

Northwest Highway & Garland Rd. Dallas, Texas
11500 McCree Rd. Dallas TX. 75238
GPS 32.866867, -96.671400
Class AA AMA Sanction # _____
Pilots Meeting at 9:30 AM Friday, Saturday & Sunday

Friday 04-26

Record Ratio Speed
NASS Sport Jet
NASS Perky Speed

Saturday 04-27

Texas Quickie Rat
Super Slow Rat
Sport Goodyear

Sunday 04-28

Clown
AMA Goodyear
Mouse 1

Speed events all three days. All events are (JSO). Helmets required for racing pit crews.

Entry Fee: \$20 first event, \$5 each additional event.

Contest Director: Patrick Hempel
For additional info. On event rules.
See Web Site: www.dmaa-1902.org

Sponsored by
Dallas Model Aircraft Association
Fuel and awards provided
By NASS, DMAA & NCLRA
AMA: License & Entry fee required

Racing Event Director: Mike Greb



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Fuel ready mixed top quality finest ingredients.
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ZALP ENGINES

Zalp F2C&F2D engines- Bob Whitney
456 Garvey rd sw, Palm Bay FL 32908 f2cracer@aol.com

ZZ Props

Full line of quality Glass & Carbon Fiber props for CL Speed & Racing.
Contact Mike Hazel at: 503-871-1057 24 Hour Phone. Email:
zzclspeed@aol.com

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Manufacturer of NELSON Racing Engines and parts, Nelson Glow
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538- 5282. e-mail: nelcomp101@gmail.com

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Whitmore Lake, MI 48189-9124
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Phone: 218-724-0928(hm) E-Mail: tawilk36@cpinternet.com

JON FLETCHER

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33 Lagari Close, Wingham, NSW 2429
Australia Tel. 61 2 6553 4548

BILL's Rent-A-Racer PARTS AND ACCESSORIES

Fuselage mounted FUEL SHUTOFF **\$20.00**
bottom pull, specify Goodyear (1 1/4")
or Quickie Rat (1 1/2")

Sullivan medium fuel tubing **\$2.00/ft**
soft silicone, great for shutoffs **or \$5.00/ 3 ft**

ASP/ Magnum 15 VENTURI (blue) **\$10.00**
1/4" ID, 4mm spraybar, fits 10mm hole

SH 15 VENTURI (red) **\$10.00**
.266 ID, 4mm spraybar, fits 10mm hole

ENYA Supertigre style needle assembly **\$16.00**

replacement needle only **\$6.00**
fits all Supertigre style spraybars

1 oz Sport Goodyear fuel tank **\$20.00**
with pinch-off overflow

bellcrank button kit **\$2.00**
includes hex buttons, eyelets, screws

5 oz. mouse fuel bottle **\$7.00**

8 oz. fuel bottle with fitting **\$10.00**

16 oz fuel bottle for 1/8" fill tube **\$12.00**
for rubber quick fill **\$15.00**

Shipping

\$12.00 per order including fuel tanks, bottles.
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