

June 2014 Edition

# Wine Country Flyers



**Next meeting: Sunday, 6 July 2014, 11:00 A.M.  
At the Trentadue field**

**Show up early and fly, or fly after the meeting!!!  
Starting Sunday, May 4th, membership meetings will be the  
FIRST SUNDAY of each month and held at the flying field at 11:00 A.M.  
[www.wcflyers.com](http://www.wcflyers.com)**

Promoting Model Aviation in Sonoma County

## 2014 Club Officers:

President :	Tony McDonald	(707) 479-2152	<a href="mailto:mcdancing1@yahoo.com">mcdancing1@yahoo.com</a>
Vice President:	Wylie Walters	(707) 235-6383	<a href="mailto:raidery73@yahoo.com">raidery73@yahoo.com</a>
Secretary:	Paul Kohlmann	(707) 837-9437	<a href="mailto:Paul.Kohlmann@jdsu.com">Paul.Kohlmann@jdsu.com</a>
Treasurer:	Phil Leech	(707) 538-8557	<a href="mailto:leechstudios@sonic.net">leechstudios@sonic.net</a>
Safety Officer:	Wylie Walters	(707) 235-6383	<a href="mailto:raidery73@yahoo.com">raidery73@yahoo.com</a>

## 2014 Board Members:

Merle McGregor	(707) 585-1061	<a href="mailto:merle_mcgregor@yahoo.com">merle_mcgregor@yahoo.com</a>
Dave Mercer	(707) 304-3967	<a href="mailto:mcdave@sonic.net">mcdave@sonic.net</a>
Jacob McDonald	(707) 327-6627	<a href="mailto:Jmcdracer@yahoo.com">Jmcdracer@yahoo.com</a>
John Reade	(707) 545-9831	<a href="mailto:jqireade3@sonic.net">jqireade3@sonic.net</a>

Newsletter Team: Dave Mercer, Phil Leech  
Website: Patrick O'Halloran

## *Cover Image*

Created by: Richard Skaff  
Caption/Comments by: Dave Mercer

***Below is a reminder of one of our best events of the year. Our 2014 Open House event.  
You don't want to miss it! It's always a great spectacle.  
You should have already received a separate e-mail with this flyer attached, but for those  
who missed it here it is again.***

# Wine Country Flyers

## Open House

Event Location: Highway 101 to Independence Lane – Watch for Signs to WCF Flying Field

**June 29, 2014**

**FLYING EVENTS BEGIN AT 10A.M**

**SHOOT DOWN AN R/C PLANE WITH A PAINTBALL GUN!**



### **Airshow Performances to Include:**

**Banner towing, Rockets, Pylon Racing, 3D Aerobatics,  
Helicopters, and WWI & WWII Aircraft**

**Amazing BBQ by Glenn and Dawnelle Binkley**  
**Special thanks to [Jake's Performance Hobbies](#)**

## ***Presidents Report***

By: Tony McDonald  
25 May 2014

Wow, here we are half way through the year already! It's been great to see our new members taking an active role in the club. I think the changes the board and membership have taken to get new people to enjoy the Wine Country Flyers RC club is working. At this point I believe we are at eighty members.

The float flys that Merle McGregor has been organizing seem to have more and more people attending, a lot of people have been trying their hand at flying off of water. Jacob McDonald has been encouraging the pylon racers to follow the National Miniature Pylon Racing Association's rules during this year's races. He has proved to be an asset with keeping the playing field even and fair for the competitors.

Richard Skaff, and George Leap are planning the Wine Country Flyers "Opening Day" event on June 29th. With the paintball shoot down followed by a BBQ, the event should be a good time.

Keep Flyin', Tony

## ***Vice Presidents Report*** ***Safety Officer Report***

By: Wylie Walters  
25 June 2014

With the flying season in full force and the summer weather here just a reminder for those experienced pilots and some new information for the new pilots of heat effects on aircraft. As the temperature increases the efficiency of your aircraft will go down due to the decrease in air density, which includes decreased lift, prop or rotor less efficient, decrease in power from gas and nitro motors. At sea level with standard temp of 59 degrees and 29.92"mg if the temp increases to 95 the

density altitude (altitude your aircraft thinks its flying at) increases to just over 2,500ft. So remember your take off, landing and stall speeds will all increase. For electric planes make sure your battery and esc have sufficient cooling. A couple years ago at the 4th of July float fly we were going through a 100 degree heat wave and at least 3 planes has there esc's overheat and catch fire in flight. Unless you want your batteries to puff keep them out of direct sunlight in the heat and do not leave them in your car, I read about a guy who forgot he had a battery in his parked car and as the temp inside increased the battery exploded and his car was a total loss. Just a few things to think about while you enjoy your summer flying. And don't forget your sunscreen.

## ***Editors Update***

By: Dave Mercer

It's hard to believe that we're already midway through the 2014 flying season. Where does the time go? To update you on some recent developments I should mention that our new solar panels are up and running. Actually two of the four panels are currently powering our charging table—as of June 14<sup>th</sup>. I went up to the field that Saturday, disconnected the old panels, and wired up two of the new panels to one of the new controllers, powering our entire table. As soon as Mike C. is able to acquire four more batteries I can proceed further and split the system in half, with two panels feeding one side of our table and the other two panels feeding the other side. He had to wait till our Treasurer Phil got back from vacation to get the necessary funds—but Phil's back!!!, so it won't be long now. Even still, as it stands now, when I was back at the field at our latest pylon racing event on June 22<sup>nd</sup>, after charging for a week I hooked up my voltmeter and amp meter and was pleased to note a much higher residual voltage (14 volts versus 12 point something before) along with a five times greater current input than ever before. Once I get the other two panels

connected we should see a 10 TIMES overall improvement; which is exactly as planned, going from a 45 watt system to a 480 watt system. Ya gotta love it when a plan comes together and it all works as anticipated—at least I do !! There was one thing that wasn't working on June 22<sup>nd</sup> at the charging table. While I was checking voltages I noticed that the banana jack box at the eastern end of the table was dead. The 100 amp breaker was tripped but resetting that only brought the copper wire buss-bars back to life, not the banana jacks. Something has failed inside the banana jack box. I will look into that and correct that situation soon. Overall, the charging table upgrade is nearly complete. Four more batteries, re-cover the table, and some final wiring alterations are about all that's left.

What's new with the newsletter? I'm glad you asked. This month I'm not going to reveal who was last month's Guess This Mess contributor. After sending out last month's newsletter I got a text message from the club member whose shop that was, wondering "Hey, why's my photo upside down?" I just save them and print them exactly as I receive them. I went back and double checked and sure enough, what I printed in the newsletter was precisely what I received in the e-mail

attachment. At the time I thought it looked kinda bizarre, but hey, it ain't my shop. Something got crossed up between taking the picture and sending the picture. In light of all that, I'm running the same photo only right side up this time. Looks a whole lot better; with plenty of clues for you to figure out who this might be. I will do my best not to let this happen again, but in the future if you can't figure out whose shop is being highlighted, grab your monitor and twist it around 180 degrees. It just might help 😊

That's all for this month,  
Dave Mercer  
WCF Newsletter Scribbler

### ***Guess This Mess!!***

By: Dave Mercer

Last month's shop: Let's try this again. Right side up this time.

Winning Guess: Tony McDonald, but I suspect he was standing on his head at the time 😊 Lets see who else can figure this out.

Whose shop is this? Anybody care to guess?



## *General Meeting Minutes*

### *June Meeting*

By: Paul Kohlmann  
1 June 2014

**June 1, 2014**

Trentadue Field

Called to order by Wylie Walters at 11:00am  
26 members were present

**(Vice) President's Report**—Tony was racing in Oakdale, so Wylie stepped up. He opened with an update on Tony and Jake's performance at the races. Jake came in 3<sup>rd</sup>

and Tony 2nd on the two pole course.

Wylie also thanked the membership for the great turn out for the Work Party. A lot was done and the field is looking great. A special thanks to Dave Mercer for his work on the Charging Station upgrade.

**Secretary's Report**—Paul got in touch with Matthew Doyel, the Flight Director for PCAM.

There is not much planning going on yet on the PCAM side but the two organizations are connected.

**Treasurer's Report**—Phil was not present as he is currently cruising the Rhine, but he reported the account balances: Checking \$6,561.65, and CD \$7,438.64. 80 members are now in good standing.

**New Members/Guests/Member Update**—Bilal recently had a stroke and is recovering. The Club offers our best wishes for a speedy recovery.

**Float Fly #2**—unfortunately the wind was blowing 20mph, so only Tony had a plane of sufficiently low value to attempt a very short flight. The July 4th Float Fly will include a \$5 BBQ and is expected to be a good make up event.

**Opening House**—Richard Skaff made up flyers for the event and they are circulating online and in hardcopy. Richard is trying to lock down a banner plane pilot. The BBQ is coming together and overall it is shaping up nicely for this event on June 29th.

**Show and Tell**—no show and tell this month

### **Auction/Raffle**

**The Raffle** pulled in \$145.

George—Archer BNF  
 Adam—Spectrum Rx  
 Dave—Lipo sack  
 Allen—foam stand  
 Jason—balsa glider  
 Bill—T28 prop

**The Auction** pulled in \$35.

Carbon Traveler--\$15  
 Reversible 3D--\$15  
 UM Mosquito--\$5

Meeting adjourned at 11:40am.

## ***Board Meeting Minutes***

### ***June Meeting***

By: Paul Kohlmann  
 2 June 2014

#### **June Board Meeting**

6/2/14

Convened by Tony MacDonald at 6:30pm at the offices of JDSU

**Vice President/Safety Officer's Report** (Wylie)—we reviewed the Membership Meeting of the day before and were pleased with the turnout. There was a lot of flying before and after the meeting, which was a big part of the goal. We even saw helis again with Gabe Black, and Jason DeLoach present. There was even a confirmed Jeff Penner sighting.

**John Reade** made a big haul in the raffle and auction, so expect some good stuff next month.

**Secretary's Report** (Paul)—no updates

**Treasurer's Report** (Phil)—Phil was away on vacation. He provided an account update for the Membership Meeting.

**Charging Table Update** (Dave)—new panels are mounted. Next step is to patch into the conduit and some carpentry on the table. Dave is making steady progress.

**Pylon Race Update**—EF-1's will continue to be weighed but just once prior to the first heat. Racers are getting used to flying above the pylons. No other big changes on the way.

On a race related topic, Tony proposed that we create a discounted membership fee for flyers beyond a certain radius from the field. The purpose would be to encourage some active flyers from other areas, particularly the racing circuit, to join our club. Considering the light use that we would see from folks that far away, a half-rate fee would be fair. We also acknowledged that some of our existing

members from far away are rarely seen anymore due to unusually long commutes. This might be a good turn for those folks as well.

**Float Fly #2**—cancelled. Way too windy. Bummer. BBQ at Float Fly #3 on July 4<sup>th</sup>.

**Training Program**—training document discussed last month has been written. Next step in reviving the training program is to sign up some instructors.

**Newsletter (Dave)**— Tony got a correct guess and will receive free raffle tickets at next month's Membership Meeting, for his Guess This Mess submittal.

## ***Info From Other Clubs***

By: Dave Mercer

**Editor's note: the following was forwarded to me from Tony McDonald concerning a racing series some club members may be interested in.**

[www.rcpylonracing.com](http://www.rcpylonracing.com)

Here is the Triangle series schedule:

- March 29th: Triangle Series T-34, Warbird, Electric Formula 1 Race Fresno, CA
- May 3rd: Triangle Series T-34, Warbird, Electric Formula 1 Morgan Hill, CA
- June 21st/22nd: Saturday -Triangle Series T-34, Warbird, Electric Formula 1 Sunday - 3 pole Electric Formula 1 and 424 Q500 Oakdale, CA
- August 9th: Triangle Series T-34, Warbird, Electric Formula 1 Salinas, CA (no unlimited)
- October 4th: Triangle Series T-34, Warbird, Electric Formula 1 Morgan Hill, CA

## ***Treasurers Report***

***June 2014***

By: Phil Leech

Membership:

Total: 80

Returning: 70

2014 New: 10

Youth: 8

Financials:

Checking balance: \$6561.65

CD: \$7438.64

## ***Member Contributions***

By: Tony McDonald

**Editors note: The following is an article submitted by Tony. It's a fascinating look at what it takes to compete at the Unlimited level at the Reno Air Races. It was written in 2001, so some of the info is outdated or may be different today. Yet it's still a great summary of what these racing teams need to do to win. It's a lengthy article, so I'm going to split it up into several installments. Enjoy the first installment, and hopefully you'll be chomping at the bit for the next newsletter to come out with the next installment.**

## ***Reno for Gearheads***

By: Graham White

This report will not be your usual Reno air race report, instead it will concentrate on the

unique go-fast features and state of the art engineering that makes Unlimited class air racing the world's fastest motor sport.

For 2001 twenty-nine Unlimiteds had entered, These aircraft ranged from balls to the wall, out and out racers to stock warbirds. If it were not for the wonderful hospitality heaped upon me while at Reno I would never have been able to gather all the neat information incorporated into this report. Pete Law has been involved with Unlimited teams since the 1960s. He started his racing career by designing all the systems; cooling, carburation, ADI and hydraulic for Darryl Greenamayer's F8F Bearcat. This aircraft re-wrote the rules for the Unlimiteds. Not surprising considering that until his recent retirement, Pete was a high level executive working at the Lockheed Skunk Works. I recently got to know Pete and he kindly took 3 hours out of his busy schedule to introduce me to every Unlimited team. Additionally, Pete is a fountain of knowledge on just about every aircraft, mainly because he probably rebuilt and set up the carburetor, designed the spray bar system and ADI system. Others also displayed similar hospitality.

Unlimited racers compete around an 8.2688 mile course marked off with pylons. The pylons are 55 gallon oil drums placed high up on a pole. Although no restrictions exist for the type of aircraft flown, the vast majority of racers are ex-World War II fighters. This is simply because these aircraft represented the fastest piston driven aircraft ever manufactured. Of course, the top racers are highly modified - as we shall see. An argument that has raged almost from the days of the Wright brothers first flight is; which is better: air cooled radial or, liquid-cooled inline. Even to this day, that argument has not been settled. And perhaps this is the way it should be. The see-saw battle of liquid-cooled inline vs. air cooled radial will, apparently, never abate.

Below is a brief synopsis of each aircraft and the modifications incorporated.

### **Racer #4 Dago Red - Highly Modified P-51D.**

Dago Red is right at the top of Unlimited racing. It has held the FAI 15 km straight line record at 517.06 mph since 1983 and is presently the fastest qualifier ever at Reno, 490.825 mph. So what makes this aircraft such a phenomenal performer?

This aircraft has been on the race circuit for many years. It started out as a P-51D Mustang. Registered as N5410V it was wrecked and rebuilt in its current highly modified form, and now has been a leading race campaigner since 1982. Hard to say what percentage of the original aircraft remains but we can be sure of one thing; it ain't much.

#### **Engine Modifications:**

P-51Ds are normally powered by a Packard built Rolls-Royce Merlin V-1650-7. In stock configuration it is rated at 1,450 horsepower. Dago Red's engine puts out an estimated 3,500 to 3,800 horsepower. And remember, a stock Merlin is no slouch incorporating features such as overhead camshafts actuating four valves per cylinder, two stage intercooled and aftercooled supercharging.....etc. In order for a Merlin to survive at such remarkable powers, first order of business is to beef up the basic structure and strengthen it. As is typical with most V-12 engines, the Merlin features 7 main bearings to support the crankshaft. In the Merlin's case, the main bearing caps have additional support by featuring cross bolts that go right through the engine's crankcase and through the main bearing caps - one either side of the main bearing hold down studs. Rigidity of the crankcase and crankshaft is essential to make the engine survive under high power operation. Therefore, one of the first modifications is to increase the size of the cross bolts. With seven main bearings and two cross bolts per main, a total of 14 main bearing cross bolts are utilized. As an additional aid to stiffening the entire power section structure, the 14 cross bolts go



through massive external steel plates that run the entire length of the power section. So far so good. But all this additional power introduces another problem not envisioned by Rolls-Royce. The massive four blade Hamilton Standard propeller is driven through a spur reduction gear that is housed in a nose case. Of course, all this additional power is translated into more propeller thrust. In order for the nose case to stay on the engine, a steel strap attached to the nose case, bolts to the crankcase inside the intake valley. Interestingly, this modification may have been inspired from a repair scheme of World War II. It was quite common for aircraft to make emergency gear-up landings. With a Merlin this would inevitably result in a damaged nose case and/or crankcase (see illustration). Another key item that needs improving over stock is the lubrication system. A stock Merlin has a conventional dry sump system and runs 60 to 80 psi hot oil pressure. Under racing conditions, this is not sufficient. First off the stock pump gears are replaced with longer ones to increase the pump's displacement. However, even this is not sufficient so an additional pump is installed in parallel with the original pump. Merlins have two accessory drive pads on the rear of each cylinder head, four in all. Normally, these pads are used for driving an air compressor, tach. generator...etc. One of these drive pads is used for the additional oil pump. An Allison V-1710 pump does the trick. Oil pressure, with these modifications now runs over 100psi hot. With all this additional oil being pumped into the engine, scavenging becomes more critical. A stock Merlin has a windage tray to catch oil slung off the crankshaft. An additional windage tray is installed to improve scavenging. To further improve scavenging, the vacuum pump is now pressed into service as an additional scavenge pump. O.K., now we have taken care of the oil supply and scavenging chores, however, the oil has now picked up a tremendous amount of rejected heat. A stock P-51D uses an air-to-oil honey comb cooler mounted in the so-called dog-house. For Dago Red, this oil cooling system is totally inadequate. So Dago Red utilizes the

P-51H oil cooling system. In other words, a water/glycol to oil cooler is mounted in front of the fire wall. Coolant is pumped through the oil cooler then to a radiator mounted in the dog house. This offers a far more effective heat rejection route. To further condition the oil, a sophisticated deaerator is installed to purge the entrapped air. However, it's not just the oil that needs to be cooled, the engine coolant, a 50/50 mix of water and ethylene glycol, is circulated through the engine. Running at elevated power settings, a stock cooling system would simply be overwhelmed. It seems that a power setting of 80 in.Hg. Abs manifold pressure is about all the stock cooling system can safely handle. To combat overheating, a highly modified radiator, manufactured by Dave Griswold, is used. It has more tubes, more fins and more rows. To further augment cooling, water is sprayed on the radiator core. Water is introduced via a spray bar system designed by Pete Law. As Bill Kirchenfaut, Dago Red's crew chief, so eloquently stated; at race speeds, it's like Niagara falls spraying on that radiator core. The fact that no after cooler is employed (see explanation later) allows a larger engine radiator to be used. The area normally occupied by the aftercooler radiator is used for engine cooling chores. If one looks carefully at TV images of top Reno Unlimited racers, a distinctive trail of steam can be seen issuing behind the aircraft. This steam is generated by spray bar water that flashes off as it makes contact with the high temperature radiator core. Dago Red will consume approximately 60 gallons of spray bar water in a race, which lasts about 15 minutes. With all these cooling system modifications, coolant temperature runs at 100 degree C and oil runs at 85 degrees C. From the foregoing, it can be ascertained that raising the power of the Merlin is a question of chasing down all the potential weak points. One component in a high horsepower engine that undergoes incredible stress is the connecting rod, possibly one of the most critical of all internal parts. Stock Merlin connecting rods are typical of their ilk, they are blade and fork, although Rolls-Royce took the more difficult

manufacturing route of using the 'marine block' variation on this concept (see illustration). Although exquisitely made, Rolls-Royce connecting rods were only designed to tolerate the loads of a stock engine. When manifold pressures exceed 100 in.Hg. Abs, they become fragile. One of the Merlin's main competitor's during WWII was the General Motors built Allison V-1710. Conceptually very similar to the Merlin, i.e., liquid-cooled V-12 and similar displacement. Although much maligned, the Allison was another superb example of aircraft engine design. One feature in particular that distinguished the Allison was the stoutness of its connecting rods. As with the Merlin they were of blade and fork design but considerably stronger. This hands the hot rodders a golden opportunity. Although the center distances from the journal to the wrist pin are slightly different, this can be compensated for by forging special pistons with a higher compression ratio. The ultimate Allison series built were the 'G' series and specifically the G6 series. These G6 rods are the ones installed in Dago Red's Merlin. One normally thinks of Allisons being built in the tens of thousands, which is true, however, only 750 G6 engines were built. Their only application was the North American F-82 Twin Mustang. The available supply has been further depleted by 50+ years unlimited hydroplane racing and tractor pullers where they were the favored Allison. For this reason G6 Allison rods are a much sought after component.

Now that the engine has received structural rigidity, an oil system and cooling system that can handle the additional requirements with beefed up internal and external components, it's time to get serious about making more power. With a highly supercharged engine such as the Merlin, the easy and obvious route is to simply crank up the manifold pressure. And that's exactly what Dago Red does - among other things. It is almost a waste of time trying to improve upon the intake port design or finish. In stock configuration, Merlins' were ported and polished. In service, Merlins' were usually

limited, depending on dash number, to 60 in.Hg. Abs This pressure was preset via the automatic boost control. In other words, a pilot could push the throttle to the firewall but the engine would not be overboosted, but it would not operate at full throttle at sea level either. So of course the first thing the racers do is get rid of the automatic boost control. One undesirable by-product of supercharging is increased charge temperature due to compression heating. Rolls-Royce took care of this by having an intercooler and aftercooler incorporated into the supercharger. This simply means two supercharger impellers run in series to boost manifold pressure (see illustration). A coolant jacket in the supercharger housing acts as the intercooler between the two stages, but it really does not accomplish much. Most of the heat from compression is rejected via the after cooler. This is a rectangular, boxy-looking heat exchanger that sits on top of the engine towards the rear. It is a radiator core with compressed fuel/air mixture on the outside of the radiator tubes and coolant flowing through the tubes (see illustration). Works great for reducing charge temperatures, however, it creates a restriction that reduces manifold pressure by about 1 in.Hg. Abs. For a stock Merlin, it's not significant, but for Dago Red's race engine, running at an astronomical manifold pressure, it's a problem to the tune of costing approximately 5 in.Hg.Abs. To get by this problem, a simple pipe replaces the aftercooler. This now introduces the problem of how to get the charge temperature down. This is accomplished by introducing massive amounts of ADI fluid. ADI stands for anti detonation injection. ADI serves two primary purposes; firstly it reduces the charge temperature, via evaporation, as it is sprayed into the intake system. A lower charge temperature increases the density of the charge and reduces the onset of detonation. Secondly, once ADI enters the combustion chamber, it reduces the flame front temperature, again delaying the onset of detonation. ADI fluid is introduced at the intake elbow, colloquially referred to as the Horse's Ass because that's what it looks

like..!!! ADI fluid is made up of a 50/50 mix of distilled water and ethanol or methanol. Engines with the aftercooler removed are referred to as 'tube engines.' by the racers. As noted above, stock P-51Ds were typically powered by a Packard built V-1650-7. However, that was not the ultimate Merlin. After World War II, Rolls-Royce developed a civilian version of the Merlin for the more demanding environment of civilian airliner operation, (long range cruise at high power). Rolls-Royce toiled long and hard to get some semblance of reliability and longevity out of the engine. The outcome was the so-called 'transport engine' or more correctly, the Merlin 500 and 600 series. These engines had all heavily stressed parts beefed up, improved cooling jacket design, heavy duty valves....etc. Dago Red uses a Merlin 622 power section with a Packard built V-1650-9 supercharger. The dash nine has optimal supercharger ratios for increased boost. This brings up the next question; how much boost does Dago Red run in a race? The quick and easy answer is; it all depends. During qualifying, only sufficient power is used to move up to the next round. However, when it gets down to the final Gold Race, everything is allowed to hang out. Maximum boost is primarily determined by engine rpm and secondly by ambient temperature and air pressure. In this engine it can run in the 135 to 140 in. Hg. range when at 3400 rpm. Assisting boost is a carefully designed ram air scoop. For Dago Red it is made from fiber glass with an ideal convergent/divergent design. This design picks up approximately 3 to 5 inches of manifold pressure at race speeds. Theoretically, it is possible to run an even higher manifold pressure than 140 in.Hg. Abs But at 140 inches the point of diminishing returns has been reached. In other words so much power is consumed driving the supercharger, very little, if any, additional power is fed to the propeller. At 140 inches, the Merlin two stage supercharger is consuming in excess of 1,000 horsepower to drive. It has even been argued that anything in excess of 100 inches does not produce any additional power to the propeller, however the

aircraft will fly faster when running in excess of 100 inches. The argument presented is the fact jet thrust from the exhaust stacks is increased at the higher manifold pressure resulting in a higher air speed.

With all these radical modifications, the engine now has to spin up faster. A stock Merlin is red lined at 3,000 rpm. This may not sound like much but remember, this engine has a 6 inch stroke. By modifying the 'speeder' spring in the propeller governor, Dago Red runs at 3,400 rpm. It would be nice if the engine could be spun faster, however, engine speed is limited by several factors; lowest reduction gear ratio for a Merlin is .420:1 and secondly, propeller tip speed. When tip speeds approach or exceed 1,000 feet per second, propeller efficiency goes down hill. In the past folks have tried to make their own reduction gears with lower ratios than .420:1, however, this means using a smaller pinion and a larger gear. The smaller pinion introduces unacceptably high gear tooth loadings so at the present, this is not an option (see illustration). Two massive oil jets squirt oil into the reduction gears at the point of engagement, so it's not a question of too little lubrication.

### **Airframe Modifications**

All external airframe skins are smoothed out. The so-called radiator 'Dog-House' (the device which responsible for the P-51D being able to develop positive 'jet thrust' sufficient to offset cooling drag, sometimes referred to as the 'Meredith Effect" named after the RAE engineer who is generally credited with the concept) is totally redesigned with reduced frontal area. Interestingly, Dago Red's dog house does not feature a laminar flow splitter as one would normally expect to see. A tiny bubble canopy replaces the stock P-51D's. Wing area is reduced by clipping the wings. The propeller is stock, albeit highly polished on the front and flat black on the rear. It would be nice to polish the prop on both sides, however, this would introduce severe glare resulting in a serious safety concern for the pilot.

Dago Red is owned by Terry Bland and flown by Skip Holm.

**Editors note: to be continued next month.....**

After Monday's qualifying, it was noticed that an exhaust stack on Dago Red's 'B' bank was smoking. After further investigation, coolant was found on the center spark plug - a bad sign. The crew set to and removed the head and bank assembly. Sure enough, a large crack was found in the center of the cylinder head that had migrated into the intake port. That head is now an expensive paper weight, it is unrepairable. A spare head and bank assembly was installed. For those who have not worked on a Merlin, this is a major operation, particularly for a race Merlin.

During a 15 minute race, it is not unusual for Dago Red to consume an astounding 2,200 pounds of liquid in the form of fuel, ADI fluid and spray bar water broken down as follows: 900 pounds of spray bar water, 300 pounds of ADI fluid and 1,000 pounds of fuel.

### ***Upcoming Events***

By: Dave Mercer

Another noteworthy WCF event is coming up real soon. The next WCF Float Fly is scheduled for July 4<sup>th</sup>, about a week away. Larry Gustafson has offered to host a barbeque there in the parking lot, for a mere five bucks (most likely) getting you a grilled cheeseburger and chips, potato salad, etc. or a hotdog if you prefer. Whatever he decides to do I'm sure he'll do an outstanding job.

I'm really looking forward to launching my Seawind and tiny micro Icon A5 off water again.

Come on out in the morning and fly with us, enjoy the barbeque, and then you can always catch some fireworks that night. What better way to spend the 4<sup>th</sup> of July?

## WCF 2014 EVENTS SCHEDULE (TENTATIVE)

<u>Event</u>	<u>Date</u>	<u>Contact</u>
OPEN HOUSE	SUN JUN 29	RICHARD SKAFF
FLOAT FLY #3	FRI JUL 4	MERLE
PYLON RACE #5	SUN JUL 20	JACOB
PYLON RACE #6	SUN AUG 17	JACOB
LARRY FRANK/NEIL TAYLOR	SUN AUG 24	RICHARD SKAFF
FLOAT FLY #4	MON SEP 1	MERLE
RENO RACES	SEP 10-14	RENO
PCAM	SEP 20-21	PAUL
PYLON RACE #7	SUN SEP 28	JACOB
PYLON RACE #8	SUN OCT 19	JACOB
PYLON RACE #9	SUN NOV 16	JACOB
CHRISTMAS PARTY	FRI DEC 5	PHIL

## EVENTS IN THE PLANNING STAGES, STILL UNSCHEDULED:

2 MORE FUN FLIES  
 3D BOWLING  
 BBQ NIGHT AT THE FIELD  
 NIGHT FLY