



# RVator's Log

Newsletter of the Twin Cities RV Builder's Group

## March 2006

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### Upcoming Events

**March 11:** Minnesota Wing March Meeting – Special guest will be speed merchant Dick Martin and his souped-up RV-8

**NOTE:** Have you paid your 2006 dues??? \$20 for the year includes four issues of the award winning *RVator's Log* and all the donuts you can eat!

\* \* \* \* \*

### Minnesota Wing Van's Air Force

**Pres:** Doug Weiler, 651-398-1184, [dcw@mnwing.org](mailto:dcw@mnwing.org)

**Sec/Treas:** Jim Lenzmeier, 651-633-8488, [jlenzmer@msn.com](mailto:jlenzmer@msn.com)

## Shop Notes

-Doug

There has always been a passion for aviation. It is from those with a glimmer of has been through three strikes who are so passionate about untold frustration to pursue thousands of individuals in aviation sustains them during



something special about those folks with prevalent in all aspects of this industry a dream to the hardened 747 captain who and a couple bankruptcies. Those of us aviation will subject themselves to our obsession. A timely case is the the airline industry whose love for these difficult economic times.

I suppose this passion for aviation is not unlike those who are crazy about boats, Porsches, wiener dogs, or any other obsessive avocation. But aviation seems to attract a unique set of folks that only make the thrill and adventure of flight even more enticing. So meaningful friendships are affirmed every time pilots, or wannabes get together. Yes, we have neighbor friends, work friends, church friends, relatives and acquaintances, but our aviation friends are truly special.

Several weeks ago I took a new friend flying in my RV. I met Joel at church and we hit it off immediately because of a common bond centered on aviation. I would guess Joel is in his late 60's and his link to aviation was interesting. He soloed at age 16 and became very involved in aviation as a teenager. His older brother was a pilot, which likely sparked this early interest. Joel quickly got his private and commercial licenses and gravitated to the "seat-of-the-pants" world of crop dusting. As a freshman in college, he shortly became a very accomplished ag pilot. Today, most of our college kids are happy to put in a couple shifts at Mr. Movies. But 45 years ago, Joel was slugging it out over the cotton fields of the southern U.S. in a clapped-out Piper Pawnee. He spent 4 summers dodging trees and power lines, all the while trying to stay out of serious trouble. He managed to avoid wrapping himself up in a ball and felt lucky he only had 4 forced landings (hey, two of these were in one day!!)

Surprisingly enough, after logging 2000 hours of flight time and graduating with an accounting degree at age 23, he never flew again. Oh, a buddy gave him a ride in a Cessna about 20 years ago but career and family became predominant in his life. He did keep up his subscription to Flying Magazine so a glimmer of that spark faintly remained, but he never flew himself again.

Joel and I talked flying several times and he seems so interested in my trials at NWA and my stories of the RV project, I figured I had to take him flying. So we did!! A couple weeks ago we met at the hangar and I told him all about RVs and RV building and RV flying. We talked all about the cool gizmos of today like GPS, autopilots, and EFIS doo-dads (he never flew behind anything more than an airspeed, altimeter, and compass.) Cramming in the rear pit of the RV-4 may be cruel and unusual punishment to some, but Joel loved it. We motored over to Eau Claire for the obligatory pancakes. Alex Peterson stopped in and we spent the morning solving all the world's problems and re-introducing Joel to aviation and

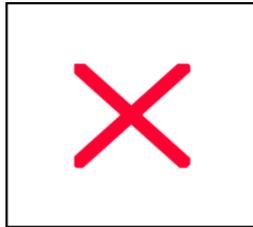
aviation friendships.

We flew back to Lake Elmo later in the morning with Alex off our wing and you should have heard the delight from the rear seat as Alex pulled up into a beautiful roll. Joel was having a blast and it was one of the most enjoyable rides I have ever given. A

week later I ran into him at the local coffee shop and he said it took him all week to calm down. He says he must have told everyone in town about what a great time he had flying and chatting with us. But he said something that caught my ear. He had long forgotten how fun it is to be around pilots and talk flying and share this common bond of aviation. "Pilots," he said, "are really special people." So well stated!! Joel retires soon and I warned him that he might have just taken one of those infamous \$80,000 RV rides. Regardless, I'm sure he'll always be a ready and enthusiastic RV passenger.

## MN Wing Update

It is mid February as we put together our newsletter update and perhaps the warm flying days are not too far in the future. Actually for those of use with flying RVs, the winter weather had not really been all that bad with rather moderate winter temperatures and fairing good flying weather much of the time.



Personally, I am approaching 275 hours on my RV-4. I installed a Monroy Traffic Watch traffic avoidance system and I can conclude it is one of the best investments I have made (see article elsewhere in this issue). Many of you may be aware of an AD that was issued on certain ECI cylinders. At first glance it appeared that my cylinders were in the effected range but I have yet to check a couple other identifying marks next time I have the cowling off. Regardless, if you have ECI cylinders, check this AD to see if you may be affected. ECI is offering a pretty attractive exchange price of about \$1300 for 4 new Titan cylinder assemblies. We'll see.

**Other news...** **Tom Berge** removed his 4 cylinders due to high oil consumption and sent them back to Aerosport for reworking. As usual Bart LeLonde turned them around in less than a week (free of charge) and they are now back on Tom's airplane. Apparently they did not break in quite like they should have. ...**Jim and Diane Lenzmeier** completed a very successful trip to Arizona in their RV-6A. They were blessed with generally good weather and even some tailwinds. Diane is now an old RV veteran!!... **Mike Casmey** reports his engine has been overhauled by Aerosport and will soon be ready for re-installation on his RV-4... **Paul and Eric Petersen** are hoping to complete their RV-6 this year... **Peter Fruehling** is working hard on his instrument rating with the goal of building an RV-7 soon (yours truly is his instructor and it took little convincing that a -7 will easily blow the doors off his Piper Warrior).

By the way... I received a nice note from Karen Nemeth of Clearwater, MN. For you newcomers, Karen and her husband Herbie were very active MN Wing members (she and Herbie built their RV-6A in less than a year). Herbie tragically passed away several years ago from cancer. Karen divides her time between her home in Clearwater, MN and Florida. She still has Herbie's rather extensive collection of WWII

memorabilia for sale. If any members are interested, I have photos of this collection and I'd be glad to put you in touch with Karen. Give me a call (715-386-1239)

**PLEASE NOTE...** As you are aware we revised our dues structure to \$20 a year and sent out a separate mailing. Jim Lenzmeier reports there are still a large number of unpaid members that are "hanging" on our mailing list. Some are nearing 3 years old!! So we will be cleaning house with the next mailing and dropping these lost souls. If you have not yet updated your 2006 membership or not sure of your status, please contact Jim at 651-633-8488 or via email at [jlenzmer@msn.com](mailto:jlenzmer@msn.com). Many thanks

## Our Second RV-10 Flies!!

*It's always great to report another first flight and this one is special since it is our second MN Wing RV-10. Tim Olson of Elk Mound, WI made his first flight on February 10, 2006. Here is his report:...*

"Now the first flight was here. The group that had gathered had grown more restless as we moved outside into the colder/breezy Wisconsin air. I was pretty warm without a jacket, but that's just because of the adrenaline factor



I taxied down to the end of our shorter runway, with a more favorable wind angle. A run-up revealed no problems. You sit there, look everything over, and I have to say that the fleeting thought of "is it all ready?" didn't last but a heartbeat. I knew I had prepared, and I knew it was time. Taking the active, I eased it to full power. It rolled to

speed quickly and I pulled back slightly to get the nose off the ground. Then I got the surprise of my life. I lifted off the ground, got into ground effect for a second, and as it came out of ground effect I had a sudden surge of climb and acceleration. It was as if the prop had grabbed hard and was tearing it's way into the sky. I've never flown an aircraft with this much power and performance, and having no passengers the performance was phenomenal! Yes, even though N220RV had performed great, this was a definite difference in power level. Within what seemed like seconds I was at 3500' AGL, as I was climbing at 2200 fpm. It flew absolutely hands-off, with no need for aileron or rudder trim, although aileron trim is installed on the plane. I flew some lazy circles around the airport while fiddling with my radios, climbing higher and higher. It takes almost no time at all to reach altitude in this plane. No more trying to decide if it's worth climbing to 7000' in the summer to beat the heat. This plane will make quick work of that. I leveled it off and without wheel pants had speeds in the range of 150kts. It's expected to add between 12 and 18kts with the wheel pants from what I heard. I also have to figure out what power settings work the best. After a few minutes I decided that I needed to show my face to the crowd that had come in support today, so I set up for landing. I did some rough calculations to convert the MPH that I had been forced to fly by last week, into kts, which is the way I like. In the end, I gave it target airspeed but basically flew it by feel, and it worked perfectly.



I set up for my first landing, slowed it down and put her gently back on the runway for a completely non-eventful landing, just the way it should be. It was a perfect time to not make a fool out of myself, and I pulled it off. I had to take it back up one more time just to waste the rest of the daylight, and I put over an hour on it for the day.

The Chelton system worked great, and when I turned on the Autopilot it flew using both GPSS and GPSV and tracked a course to the airport chosen on the EFIS. The EIS was working great as well, although I have some probe calibration

settings to do to get all readings to come in correct. Since this posting is late, I have actually flown it another day and got to play more with the radios and EFIS. Everything seems to work real well. It's impressive how much functionality the new panels can cram in.

With the first flight(s) behind me, the rest of the month can slow down a bit. I have wheel and leg fairings that need to be complete to get my speed in shape for my up and coming trip.....Sun-N-Fun in Florida, in the first week of April. I plan to be there, and as a special added bonus, I will likely have my RV-10 displayed at Van's Aircraft booth for much of the show. I hope to see lots of you there.

As a side note, I was #26 of the completed RV-10's to fly. I was the 170th RV-10 Kit sold. The day Van's updated their website with the counter for completed RV's to include my RV-10, the counter was set at 4500. That's 4 Thousand 5 Hundred KNOWN completed RV's flying. It's an amazing group of builders and pilots we have!

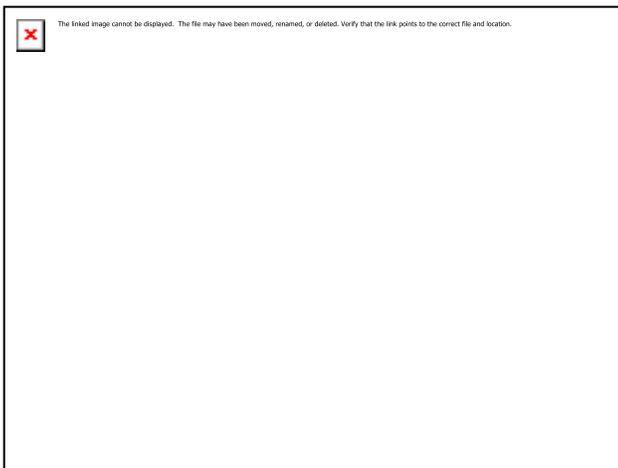
*Editor's note: Tim has put together a great website documenting the trials and tribulations of his project. Here's the link: <http://www.myrv10.com/N104CD/index.html>*

## Pete Howell's RV-9A Update

Somewhere when you are driving rivets, it hits you, this thing's not a glider, I need an engine for it..... When that happened to me, I spoke with a few people and decided I wanted to build a kit engine rather than find a core and overhaul it.

I met Robbie Attaway [www.attawayair.com](http://www.attawayair.com) through some RV builders online. Robbie spent lot of time answering my engine questions and he pointed me to Richard Fowler of America's Aircraft Engines [www.overhaul.com](http://www.overhaul.com) in Tulsa. I checked some independent references and they all had good things to say about the ECI O-320 kit and the guys in Tulsa. So I called Richard, placed an order, and sent him a deposit. We were hoping to have the engine a few weeks after Oshkosh, but ECI was not happy with the machining of the crankcases they were getting from a supplier, so things were delayed few months. No worries, as I was still in a mess of wires with my panel. In September, I was lucky enough to attend the Land of Enchantment fly in with some of the MN wing members where I met up with Robbie and the America's Aircraft Engines guys. They told me my crankcase would be ready in a few weeks. Since I had a day off coming up, I asked Richard if I could come down and watch the build. He told me I could watch, help, or do it all myself under their supervision. They called the next week and said everything was ready – and asked what color I wanted the case and cylinders painted. I told them I liked the standard red and black and that I would be down on Friday.

Sooo.....Thursday night I flew from Minneapolis to Tulsa on a CRJ to help with the build of the engine for my RV-9A. Richard Fowler picked me up from the hotel at 7:30 and we headed to the shop. I was given a tour of the facility and got a chance to meet the crew. They have 5 engine builders and assemble or overhaul over 25 engines a month. Richard introduced me to Ryan, the A&P who would be working with me. This guy knows engines, and he is meticulous. He had system for doing everything, with built in double checks for parts and processes. Any time a critical bolt or nut was tightened – it was verified by one of the other A&P's. Every time we moved from one operation to another, all the tools were put away and the bench was wiped down with lacquer thinner. He showed me the 5-10 different kinds of goo we would use as assembly lubes and taught me the right way to do many different engine-building tasks.



My kit was neatly arranged on a build cart - lots of little parts. We started by assembling the connecting rods and steadily worked from there. I pitched in here and there and took lots of pictures. The shop guys have a great time while working and it was clear no one was beyond a good verbal jab – even me. Soon we had the case assembled, and moved on the cylinders. We installed valves, springs and keepers.



Next we got the pistons and rings assembled and mounted the cylinders on the case - lots of bolts and special torques here. Ryan just kept pulling parts off the cart and like magic, they fit. It was clear he had done this more than a few times. The clock and our stomachs told us it was lunchtime.

Richard and I had a great lunch at Fuddrucker's where I found out Richard is a pilot and owns a C-180. We of course talked flying for a while. On the way back to the shop, Richard introduced me to a gentleman named John on his airport that has built many (over 20!) RV's and is in the process of building a -10 and an -8. John answered some of my newbie RV questions and it was then time to head back.

Ryan had begun work on the sump and accessory case and we got those added with no problems. Soon the fuel pump, oil filter and vacuum pad covers were on. We tackled the pushrods and sleeves and got the rockers arms installed next. At this point, I needed to leave to catch my flight back to Minneapolis. I thanked all the guys for putting up with me, and Richard very graciously drove me back to the airport.

What a way to spend the day. Met some great guys, learned a ton about my engine, and have confidence it was done right. Mine was test run,



preserved, and shipped up ready for mounting on the fuse in my garage. I am very happy with my choice of engine source. If you need an engine or an overhaul, Take a look at the ECI kit and give Robbie or Richard a call.

Move forward a few months to early February. The panel is mostly wired and I had Tom Berge, Doug Weiler,



and Alex Peterson look it over. I fixed the things they suggested, so I decided it was time to get it up on the gear and

mount the engine. I can't tell you how great it is to have a fellow builder nearby.

Bernie Weiss and I help each other out and have become great friends. He helped with the gear and the engine. I won't go into a detailed how-to on engine hanging. Just follow this link:



Bernie and the tools of ignorance

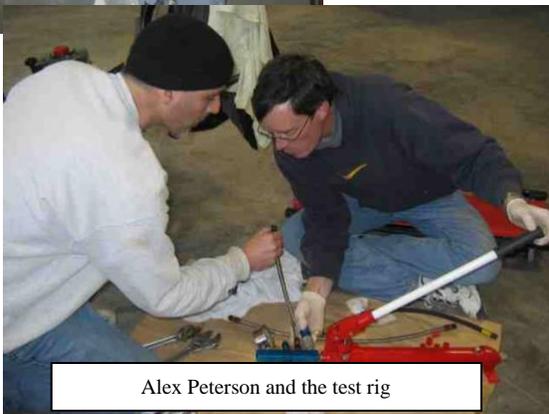
<http://www.vansairforce.net/articles/IllustratedGuideToEngineHanging/enginehanging.htm>

I is a the will



I followed their advice and it came out great. It lot easier if you have an engine hoist and a few friends to jockey Lycoming into position. The Hartzell is on the back porch and be mounted soon

After the engine was hung, Alex Peterson offered to help me pressure test my fuel and oil hoses. Alex



Alex Peterson and the test rig

built a test rig for hoses that is really slick. We hooked up each of the hoses and ran it them up just over their working

pressure. I think this testing is a good idea if you have pre-built hoses from Vans, and GREAT idea if you built your own hoses. It was easy and fun to do with Alex and I have no worries that one of these hoses will let loose and ruin my flying day.

I am finally nearing



completion of may panel. I am waiting on TruTrak to deliver my ADI Pilot 2. This is a combination of their popular 2-axis autopilot and a solid-state gyro horizon in one small package. Wiring went well and may be my favorite construction task to date.

If anyone wants to see the project, I'd be happy to host him or her at the "Airplane Factory" in St. Paul.

### How 'bout 'dem mags??'

- Noah Rosenbloom



On January 26, 1964, I was en route from MSP to RWF when the engine began to run quite rough in the Club's 1960 Cessna 172 of which I was part owner. I diverted slightly towards Hector, MN in case a landing short of my RWF destination was necessary. I talked with the FAA mechanic at RWF via radio, which was manned 24 hours a day at that time. He suggested switching mags and I found that I could maintain altitude using the left mag since the right was now identified as being bad. After landing at RWF, I asked the mechanic to check out the mags, which he did. Significantly, my flight that day was shortly after the annual inspection, which he had conducted earlier.

Inspection determined that the rotor on the right mag was broken which caused it to fire randomly. The left mag rotor had gotten me home safely but that rotor was also near failure with a noticeable crack near the mounting point. When I wondered why this had not been caught during the annual inspection, his response was that since the engine was rather

low time (3-400 hours), it was not customary to inspect the mags until they had accumulated over 500 hours.

The full extent of the problem was not discovered until, more than a year later, on November 8, 1965, I had a forced landing. Nothing apparent about the airplane's performance was noticeable that day. But I did have a vague feeling of something not quite right which I couldn't put my finger on. At stops at New Ulm and Worthington, I asked the A&P at each location to take a look and neither noted a problem.

That afternoon en route from Worthington to Redwood Falls at 6500 feet just east of Wabasso, there was a sudden onset of very rough engine operation. I could not maintain over 1500 rpm without violent vibration. There was smoke in the cockpit so I picked out a 40 acre field that appeared suitable and spiraled down to an approach leg around 600 feet AGL all the while radioing my intention. I turned final and the engine quite entirely. That large flaps of the 172, fully deployed did their thing and we set down running in the alfalfa stubble to a stop about 100 feet from a drainage ditch at the far end of the field.

When I uncowed the engine, the right rear cylinder on the 0-300 Continental was off its base, detached and had fallen into the lower cowl. Oil was everywhere as was bits of metal. We never did find the wrist pin.

About the only reason for this failure that we could figure out was that the mis-firing mag experience over a year earlier had so weakened the cylinder barrel that it finally failed. A jagged, truncated cylinder barrel remained bolted to the crankcase. The remainder including the finned head was entirely off the engine.

The lesson learned: checking the magnetos each 100 hour inspection seemed prudent. I inquired of a local repair shop and they said they check operation and external appearance each inspection and make a complete teardown or replacement at 500 hours. I suspect that was the practice of the A&P at Redwood Falls. I am left with the feeling that, although it is a judgment call, somewhat more detailed inspections of the magneto rotors is prudent.

### ***Cool Louvers***

*- Ben Beaird, Plymouth, WI*

I thought you and others might be interested in the louvers I installed in the lower cowl of my -6A. My CHT's were not alarmingly high pre-louvers, but they were in the 395F range on a hot day with 75% power. In addition, I am installing a P-mag electronic ignition and was concerned that the CHT's might get even hotter with it installed.

The louvers are from Van's. He supplies them for the RV-10 and they only cost about \$5.00 for the pair! They were

surprisingly effective. My CHT's came down 30F after installation.



I also 'glassed a "lip" on the exhaust outlet portion of the cowl in order to provide a bit of a venturi effect to draw additional air out. Not sure how effective it is, but it does look better.

### ***New Avionics Shop***

I just wanted to get the word out locally that as of this month Approach Systems Inc of Provo, Utah, manufacturers of the Fast Stack wiring system and Park Rapids Avionics of Park Rapids, Minnesota have formed a joint venture based right here in Minnesota to offer not only the plug and play wiring system but also the avionics. Park Rapids Avionics is a dealer for most avionics manufacturers plus many of the experimental avionics manufacturers including Garmin, Bendix-King, S-Tec, Dynon, OP Technologies and TruTrak Autopilots. We also offer custom laser cut, powder coated and silk screened instrument panels that have to be seen to be appreciated.

Not only are we devoted to experimental aircraft but you can also bring your certified aircraft to us as well as we are a certified repair station. With well over 15 years of experience and know how we want to become your one stop shop for avionics.

If you could help us out and get the word out to your members, put a few lines in your next newsletter or even mention us on your website we would be very appreciative. In fact, anyone who calls and mentions the "Northwoods Deal" will get a "locals" discount on any package or system. Contact: Tim Hass, GM, Approach Fast Stack, 218-237-7825, e-mail [tim@approachfaststack.com](mailto:tim@approachfaststack.com)

## Traffic Watch

-Doug Weiler

Most of you who fly around the MSP class B airspace know that on a nice flying day, there can be a scary number of



airplanes crammed under the Class B veil. In 2005, I experience four near misses that got my attention. I lusted over Tom Berge's Traffic Information System but with no available panel space (and no recently robbed banks to finance the project), I was open to any ideas.

I researched the Monroy Traffic Watch system and decided to buy it (a most reasonable \$700). It was small and could easily fit above my transponder. I installed an external antenna (just another transponder antenna), wired the voice annunciation wire into my intercom and I was good to go.

This unit simply detects nearby transponders (that are being interrogated) and gives a distance display (based on signal strength) and an altitude plus or minus relative to your altitude. It works great and I am really happy with it. You don't know specifically where around you the traffic may be but you know the relative altitude and it gets you to looking. I have recorded 3 encounters so far that I would never have known about (maybe that was just as well!!). It comes highly recommended.

## Go Fast!!!!



*Thinking about souping up that RV for a shot at Reno?? Consider this... (thanks to Peter Hook)*

**"One Second in the Life of a Racer"  
by Tom Fey**

The Unlimiteds go flashing through the racecourse, engines howling, air shearing, heat waves streaming. Four hundred eighty miles an hour is 8 miles a minute, and the elite racers take about 70 seconds to cover the 9.1-mile Reno course. If you could take a souped P-51 racer flying the circuit at Reno, slow time down, and examine just one second, what would you find? In that one second, the V-12 Rolls-Royce Merlin

engine would have gone through 60 revolutions, with each of the 48 valves slamming open and closed 30 times. The twenty-four spark plugs have fired 720 times. Each piston has traveled a total of 60 feet in linear distance at an average speed of 41 miles per hour, with the direction of movement reversing 180 degrees after every 6 inches. Three hundred and sixty power pulses have been transmitted to the crankshaft, making 360 sonic booms as the exhaust gas is expelled from the cylinder with a velocity exceeding the speed of sound.

The water pump impeller has spun 90 revolutions, sending 4 gallons of coolant surging through the engine and radiators. The oil pumps have forced 47 fluid ounces, roughly one-third gallon, of oil through the engine, oil cooler, and oil tank, scavenging heat and lubricating the flailing machinery. Perhaps 1/8 fluid ounce of engine oil has been either combusted or blown overboard via the crankcase breather tube.

The supercharger rotor has completed 348 revolutions, it's rim spinning at Mach 1, forcing 4.2 pounds or 55 ft # of ambient air into the combustion chambers under 3 atmospheres of boost pressure. Around 9 fluid ounces of high-octane aviation fuel (7,843 BTU's worth of energy) has been injected into the carburetor along with 5.3 fluid ounces of methanol/water anti-detonantation injection fluid.

In that one second, the hard-running Merlin has turned the propeller through 25 complete revolutions, with each of the blade tips having arced through a distance of 884 feet at a rotational velocity of 0.8 Mach. Fifteen fluid ounces of spray bar water has been atomized and spread across the face of the radiator to accelerate the transfer of waste heat from the cooling system to the atmosphere. In that one second, the aircraft itself has traveled 704 feet, close to 1/8 mile, or roughly 1.5% of a single lap. Over 1.65 million foot-pounds of work have been done, the equivalent of lifting a station wagon to the top of the Statue of Liberty.

The pilot's heart has taken 1.5 beats, pumping 5.4 fluid ounces of blood through his body at a peak pressure of 4.7 inches of mercury over ambient pressure. Our pilot happened to inspire during our measured second, inhaling approximately 30 cubic inches (0.5 liter) of oxygen from the on-board system, and 2.4 million, yes million, new red blood cells have been formed in the pilot's bone marrow.

In just one second, an amazing sequence of events have taken place beneath those polished cowlings and visored helmets. It's the world's fastest motor sport.

*Now that **your** heart is pumping and you have the "need for speed", don't miss our next meeting March 11. Speed guru Dick Martin will be divulging his secrets of squeezing every last knot out of your RV!!*

Minnesota Wing – Van's Air Force  
65 15<sup>th</sup> Ave. SW  
New Brighton, MN 55112-3454

First Class

**Minnesota Wing - March Meeting  
Dick Martin's RV-8**

**Sat. March 11, 2006, 10:00 am**

**Paul Hove and Doug Weiler's Hangar  
Lake Elmo Airport, MN**

Come join us for a very special meeting. Our guest will be **Dick Martin** from Green Bay, WI who will be talking on his very unusual RV-8 (weather permitting it will be in the hangar). Dick's -8 is fast... real fast, having been clocked at over 230 mph. He is an air race veteran and has done many speed mods on his airplane including a new Lycoming IO-390, AeroComposite prop, engine plenum, and much more. Other possible topics of the morning will be autopilots for your RV and your questions will always be welcome.

Coffee and goodies as always and all the hangar flying you could possibly ask for.

See you then!!!!!!

**Driving directions:** Take I-94 east towards Wisconsin. Go north on Manning Avenue (County road 15). Three miles north to Lake Elmo Airport. Enter at the north entrance (before the RR tracks). Go east past Valter's Aviation to Mooney Lane. Turn right just past the CAP hangar. Our hangar is 41C on the left.

**Phones:** hangar: 651-779-0747, Doug's cell: 651-398-1184