



Juri Keyter, Johannesburg, South Africa, finished his RV-7 in just 20 months. Chalkie Stobbart made the first flight.

How many people do you know who got their first Social Security check, private pilot certificate and RV checkout all in the same year... actually, in a four month period?

Tom Roberts, of Columbia, South Carolina, did all that.



A couple of excellent RV photos that we didn't get in time for the 2010 Calendar. We've thrown them in the bin to consider for the 2011 version.

If you've got high quality RV photos, preferably in-flight, we'd love to have a look. It's never too early.

Above: Neil Henderson's new RV-7, with a wonderful registration.

Right: a very attractive RV-10, by David Brown and Chris Murray in Queensland, Australia.





In July I flew my RV-6 from Oregon to Sterling, Illinois (KSQI) to join in preparations for a world record 37-ship formation at the upcoming EAA Airventure fly-in. We would be under the direction of FFI formation guru Stu McCurdy.

Friday started with an 'All Pilots' brief at 15:30. This involved reviewing the schedule for the next 2 days, initial briefing of the 37 ship formation, and then on to the hotel for check in and rendezvous later in the bar for... uh, more briefing and dinner.

While we ate a severe thunderstorm rolled in, hammering the area with strong winds, torrential rain, and continuous lightning. The National Weather Service issued a tornado watch. SQI/OSH Clinic Assistant/ RV-4/8 builder Axel Alvarez got us back across the quickly flooding street to our hotel using the crew van. We all piled in, soaking wet, for the less than one block ride across the street. Fortunately, I'd hangared my RV-6 so I slept well, knowing it was not being hailed on.

Saturday cleared with excellent visibilities and moderate temperatures. At 08:00 we had initial flight brief and assignments. The first hop was a 4-ship warm-up flight consisting of the same pilots/aircraft that

we were assigned to for the large formation. My 4-ship flight was 'Hotel Flight' which consisted of Gary 'Condor' Sobek (Lead), Trish 'Schoolmom' Russell (#2), myself (#3), and Dave 'Hog' Klages (#4). Hog's backseater (all the way from California) was Axel Alvarez, who photographed the event during the weekend from his unique vantage point. You can get some unusual camera angles when you have a really good photographer located within the formation.

Post-lunch, we flew the 37-ship briefing and practice -- 36 RVs and 1 Rocket. I wondered how we would join up and negotiate this many aircraft around the sky in tight formation. Fortunately, better minds than mine had thoroughly thought this through. We briefed a set of 5 formations that we would be performing on sequential passes over show center. In order:

- Diamond Cross
- Diamonds In Trail
- Arrow
- Cluster
- Diamond of Diamonds

This type of flying places critical demands on the skills of the individual flight element leads as well as the wingmen. Even more critical was the skill and timing of the three Diamond Leads, Stu 'Falcon' McCurdy, Mike 'Kahuna' Stewart, and Dan 'Sharpie' Checkoway. The goal was to put the 3 formations of aircraft over the top of show center at the exact same instant, on different headings, and separated by only 200' of altitude.



'Hog' Klages, an architect who had designed the Main Gate, was a part of the formation and arrived at Oshkosh in a symbolic way over his completed design. How cool was that!

TUESDAY 11:30 a.m... AIRVENTURE!

Startup was done on a briefed time hack. It was an amazing to go from dead silence to the roar of 37 running aircraft in about 15 seconds. We taxied out in trail, moving to staggered taxi en-route, then back to trail for the run-up. 4-ship fingertip elements positioned on the runway for launch. We made the take-off and join-up in fingertip, with the #4's dropping into slot position to form diamonds as soon as possible.

Not as easy as you might think....

KSQI - Sunday 13:00: Our mass formation flight departed KSQI and headed up to KOSH, flying in loose 'route' formation with two 16-ship and a 4-ship formations. After climbing on top of a scattered cloud layer, the ride smoothed out and visibilities were excellent. We were ready for our planned AirVenture arrival pass over Aeroshell Square and part of the commemoration ceremony of the new MainGate/Arch at precisely 13:05.

Just seconds after Tom Poberezny's introduction, a formation of 37 RVs flew over the main gate. Dave

The elements further back in the flight have to claw their way through a bit of a cross-wind and turbulence from the preceding flights in front of them. A 150' wide runway, well-qualified pilots, and a great deal of precision are needed to perform this type of departure. After all flights were launched, the last flight aloft, 'India Flight', reported 'Airborne' so that the Flight Leads could commence the join-up sequence. 'Ops checks (where pilots configure their aircraft for flight, check pressures and temps, set mixtures, freqs., etc) were quickly completed while still in 4-ship Diamonds. Once everyone was leaned, trimmed, and checked, Falcon called for the rejoin into



the two 16-ship and 5-ship diamond formations in preparation for the 'Cross' over the airshow center. Smoke calls were handled by Roy 'Jarhead' Geer for the entire flight.

The two 16-ship diamond flights as well as a third smaller 5-ship diamond were flown in a coordinated cross, with 200' vertical spacing between each element, directly over the Airventure venue. If you were located in any of the lower elements, it was difficult to NOT watch the other flight coming on an intersecting path. You found yourself either mesmerized by the sight and flying loose or slowly ducking down into your seat as they went by overhead. Timing of the Diamond Cross was critical and determined by the 16-and 5-ship flight leads (Falcon, Kahuna, and Sharpie) with GPS time to target calls. Following the 'Cross', the pattern flown was a large figure '8' with the middle of the '8' over show center.

The next formation pinned the 16-16-5-ship diamond formations together for the 'In-Trail Diamond' pass. With both flights flying opposite orbit patterns from the Diamond Cross pass, timing for the large radius turn for the rejoin was again critical. Leads calculated winds aloft, traffic, and rates of turn into the equation. The best analogy I can think of is that it was about like trying to dock two 150 mph ocean liners in space! The formations weren't about to turn on a dime. All of the Leads skills really showed here -- especially Kahuna. He was VERY smooth and nailed the second Diamond on to the first, both in practice and at OSH.

Now that all aircraft are together on the same heading, same speed, and roughly the same piece of sky, the back 16 reconfigured to build the 'Arrow' formation. The transitions were again done as 4-ship Diamond elements, in specifically sequenced moves, to ease the traffic. Each element moved in concert as briefed to make the safe transitions. About the time the Arrow

was completed, we were crossing airshow center. "Smoke on-Ready Now... Smoke off"...

A little bit larger radius turn was used as the formations became more complex and had a wider span to ease the speed issues on the wingtips. The outboard wingtip aircraft had to use full throttle in the turns to keep up. As the formation banked, the aircraft on the wingtips also had a considerable altitude change (up on the outside and down on the inside) since the entire formation was flown using 'finger-tip' turn orientation and 'banking'.

Next, we reconfigured to the 'Cluster' formation. This formation is more challenging than the previous one, especially for the separate aft 4-5-4 ship elements positioned behind the Cluster 'wing' section. The movement of aircraft flying in turbulence in front made it difficult to maintain position for the aircraft behind, especially in the turns. Without the added perspective of normal position reference lines, the Leads of the 4-5-4 elements resorted to a 'Step Down' orientation with normal 'In-Trail' spacing but an additional 3-5 feet lower than normal. This removed most of the 'Lash' effect caused by turbulence and maneuvering. Once we rolled out of the turn back inbound for the Airventure pass, the formation was dressed up just in time for "Smoke on-Ready Now... Smoke off"...

Outbound making the 'Cluster' pass we enter another large radius turn while reconfiguring to the large 'Diamond' formation. The large 'Diamond' was the most spectacular of all of the formations. From the aft portion of the Diamond, the cockpit sight picture consisted of a sea of aircraft tails! Not an ideal place if you are claustrophobic, but definitely an epic location if you are an experienced formation pilot. We definitely wanted this to look good for the folks on the ground, especially "Herman and Mabel".

Falcon explained it like this: "Herman and Mabel are fictional airshow fans making a once in a lifetime to Airventure. They want to photograph all of the sights of the airshow performances for posterity. Our mission is to ensure that Herman and Mabel leave with a perfect shot of our performance. We don't want their grandchildren asking "Why is that one airplane so far away from the others?" I could sense the other 37-ship pilots collectively recalling this as the spacing in the Diamond of Diamonds tightened up. As we rolled out of the turn inbound for our last pass of the performance, we were darn near perfect. "Smoke on-Ready Now... Smoke off"...

The last pass made, we turned outbound over Lake Winnebago. Breaking up the formation began with each flight, starting with 'India', at the rear center of the Diamond, dropping back and drifting to the outside of the slow turn we had developed. Once traffic was no longer an issue the call "India Clear" was made. Each subsequent 4-ship diamond cleared in much the same way, until we a flight of nine in-trail 4-ship diamond formations.

Large formations, especially when they are building or breaking up, need a lot of room to maneuver. It took roughly a 5-mile radius 270-degree turn to break up the flight. Recovery back to KOSH was accomplished using standard FFI arrival practices with each 4-ship flight reconfiguring to Fingertip then into Echelon, and positioning for the overhead approach into the pattern for runway 36L.

The overhead arrival is simply the fastest way to transition a formation from cruise speeds to landing. Within a few minutes the entire Van's Airforce Flight of 37 was on the ground, taxiing towards parking. Shut down when you hit the chocks. Exhale, pour yourself from your plane for the debrief.

If you saw a crowd of about 40 people standing around in dayglow yellow shirts waving their arms and making airplane hand motions, that was probably the Vans Air Force Formation Team! Nice work!

LEADING THE EFFORT *Stu McCurdy*

My input from the Flight Lead perspective: This was the 10th anniversary of FFI, so I had to do something special. (Formation Flight Inc. (FFI) is an FAA-recognized organization that trains and qualifies pilots to fly close formation in waived airspace. The mission of the program is to provide standards for formation training and flying, a system for proficiency evaluation, and a method for monitoring currency.)

Since it was Van's 37th year at Oshkosh, breaking our old Guinness World Record of 35 aircraft with a 37-ship formation seemed appropriate.

Scheduling started about three months in advance, coordinating the participating pilots, the FAA and EAA. I drew up the formation sequence plan and assigned faces to spaces. Upon arrival, coordination with OSH

Tower and RV Parking worked perfectly and the Van's Air Force Formation Team slid into their pre-arranged parking spaces like clockwork. During the show, coordination with RV Parking, Ground Controllers, and with Tower allowed taxi, takeoff, and overhead time as scheduled with no glitches. Even the weather cooperated this year.

The primary factor in this successful 37-ship formation execution was the cooperative attitudes of everyone involved. Congratulations to all.

37 Ship Formation Participants

A1- Stu McCurdy, Falcon, RV-8, Falcon Flight
A2- Bill Gunn, Gunbody, RV-4, Falcon Flight
A3- Tom Jett, Woody, RV-7A, Falcon Flight
A4- Roy Geer, Jarhead, RV-6, Falcon Flight

B1- Lowell LeMay, Pfantom, RV-7, Falcon Flight
B2- Glen Miller, Dogg, RV-8, Cincy River Rats
B3- Deven Felix, Fish, RV-4, Falcon Flight
B4- Pat Tuckey, Glider, RV-8, Falcon Flight

C1- Greg Reese, Greese, RV-8, Cincy River Rats
C2- Bud Newhouse, Joker, RV-8, Cincy River Rats
C3- Jon Thocker, Mutha, RV-8, Cincy River Rats
C4- Ron Gielegghem, Giggles, RV-8, Cincy River Rats

D1- Scott Farner, Debris, RV-7A, West Coast Ravens
D2- Brad Peacock, Wingnut, RV-4, West Coast Ravens
D3- Tim Cone, Slick, RV-8, West Coast Ravens
D4- Jim Percy, JP, RV-7A, West Coast Ravens

E1- Mike Stewart, Kahuna, RV-8, Team RV
E2- Tom Dubrouillet, Dubes, RV-8, Team RV
E3- Tad Sargent, Stripes, RV-7A, Team RV
E4- Len Leggette, Leggs, RV-8A, Team RV

F1- Bob Goodman, Subob, RV-4, Team RV
F2- Bill Crothers, Red, RV-8, Team RV
F3- Danny Kight, Speedy, RV-6, Team RV
F4- Charlie Plunkett, Bones, RV-8, Team RV

G1- Ron Schreck, Smokey, RV-8, Team RV
G2- Jon Berndsen, Reno, RV-7, Team RV
G3- Ken Harrill, Lurch, RV-6, Team RV
G4- Jerry Morris, Widget, RV-8, Team RV

H1- Gary Sobek, Condor, RV-6, West Coast Ravens
H2- Trish Russell, Schoolmom, RV-6A, West Coast Ravens
H3- Joe Blank, Shade, RV-6, West Coast Ravens
H4- Dave Klages, Hog, RV-8, West Coast Ravens

I1- Dan Checkoway, Sharpie, RV-7, West Coast Ravens and Cincy River Rats
I2- Greg Vouga, -----, RV-7A, Team RV
I3- Gregg Wilson, Wizz, RV-4, Cincy River Rats
I4- James Clark, Chatterbox, RV-6, Team RV
I5- Mark Frederick, Rocket, F-1Rocket, Falcon Flight

Chase 1- Bill Turner, Pappy, RV-8, Hawks
Chase 2- Larry Dagley, Bones, RV-8, Hawks
Chase 3- Don Pfeiffer, Taco, RV-8, Hawks

IN THE SHOP

INSTALLING THE RV-12 AVIONICS KIT

Ken Scott

So October was on the way out. RV-12 Finish Kit work was complete. The canopy worked, the fiberglass was finished and filled and the fuselage was sitting on its anklebones – boy, do those wheels camber in when there's so little weight on the gear.

I'd planned on building the wing kit over the winter, simply because wings would fit in the "warm room" tucked into the corner of my hangar, and the fuselage wouldn't. Well, wouldn't you know it... when I tried to order the wing kit before we traveled to Southern California for Thanksgiving, (weather prevented flying, and it was a long, long drive!) Anne informed me that Van's had been slammed with orders in the fourth quarter

and the earliest wing kit delivery I could get was mid-January. I put my money down, then went ahead and ordered the Avionics Kit, too, figuring that I could get it much quicker and installing it would eat up a good bit of the waiting time on the wings. It was waiting on my desk when I returned.

Like most of my time estimates, I was wrong. It did not take a few weeks. It didn't even take a few days. I installed the complete Avionics Kit in a weekend. Soup to nuts. Alpha to Omega. Finished. Done.

Granted, I didn't have the dual EFIS or Autopilot options, but I doubt they would have added much to the installation time. I was stunned. (Naturally, when Mitch Lock heard this, he wanted to know what I did with my spare time that weekend. I just laughed...I've long since realized that the MKACTION [Mitch/Ken Airplane Construction Time Factor] hovers around 1.3.)

When I built my RV-6 I probably had two full months in the panel, cutting holes, figuring out wiring, making up harnesses, printing labels, reading equipment manuals to figure out more wiring, etc., ad nauseum. With the RV-12, all the wiring was installed as part of the Finishing Kit, all the cutouts were already in the in-

strument panel segments and virtually everything I had to do was spelled out in the plans.

I started early Saturday morning and finished the day about dinner time, with time out to throw balls to the dog, eat lunch and walk the mile to the mailbox. When I went to bed, I realized that if I put a few other chores aside, I could have entire installation completed by the time I went back to work Monday morning. The Violinist volunteered to release me from Christmas shopping, (bless the woman!) so I spent Sunday in the shop.



The RV-12 panel. Total installation time: one weekend.

My first task was to remove the center section of the instrument panel which I'd riveted in earlier, before a plans revision that allowed attaching it with screws. Besides, I realized, I hadn't painted it to match the right

and left sides of the panel, and it would be much easier to spray it outside the cockpit. On the advice of the local airplane painter, I used a VeriPrime and rattlecan SEM brand paint. Boy, I wish I knew about SEM on my last project. Easy to buy, easy to use and tough as nails when it cures. Perfect for interiors and panels. I used their light gray — I already knew the guff I'd take if I painted the panel baby blue like the one in my RV-6. It works, but it's just so dull! Next time, I'll ignore "public" opinion and go back to blue.

By evening I'd had just about enough airplane building. But even with the extra work installing screws and painting, but the only thing left to close out Section 42 was installing the magnetometer in the rear fuselage. I'd left the upper skins and rear window off the fuselage, so it was relatively easy to throw in a couple of cushions, clamber in and finish the installation — which consisted of four blind rivets, six tie-wraps and plugging in the 9-pin connector.

Total working time to install the complete Avionics Kit: 16.5 hours. It's going to take longer than that to clean up and put away the tools.



BAGGAGE DOOR STRUT *Matt Dralle 82880*

The stock front baggage door on the RV-8 came with a simple arm that holds it in the open position. I'd already experienced what happens when the latch pins are in the "latched" position and the door suddenly slams shut (dents and scratches), so I really wanted to find a nice strut of some kind that would hold the door open, yet be relatively easy to install/replace/use.

Some browsing in the McMaster-Carr on-line catalog turned up what turn out to be the absolute *perfect* part for the job. The strut unit is made for tool box lids and has pre-installed mounts on each end that work perfectly on the RV-8 baggage door with no modifications whatsoever. Incredible, really. The best part is that in operation, and using the mounting dimensions shown in the pictures, the strut will securely hold the door open AND closed!

At about 2" from closed the geometry of the system has nearly zero pressure open/closed and then at the last 1" or so, slightly pulls the door down. Note that the latch pins are still needed to hold the door securely closed. Conversely, after about 3" open, there is enough push in the spring to gently open the door all the way and then hold it open very nicely. If you have an RV-8 and want a baggage door strut, look no further.

This is the perfect ticket: McMaster-Carr Part Number: 11615A14. You can find it at: <http://www.mcmaster.com/#11615A14>. At \$34.75 (circa 2009) it's a little pricey, but it's stainless steel and did I mention - works PERFECTLY on the RV-8 front baggage door. I used three standard LP4-3 pop rivets on the top attachment hinge to the side of the baggage door, and two #8 platenuts and screws on the lower attachment.

For the correct geometry, you'll want to mount the upper hinge exactly 11/16" from the bottom of the door as shown in the pictures. The lower hinge should be mounted exactly 8.0" from the exterior skin of the fuselage as shown in the picture.

VAN TUNES UP HIS RV-12

Aerodynamicists are segregationists! This should not have the negative connotation it implies. For minimum drag, we try to keep air "in its place". We try to keep air outside the airframe from integrating with air inside the airplane. More obviously, we want to keep "impure" engine compartment air from migrating into the cabin, and keep cold outside air from migrating inward. It's not just a matter of comfort for creatures in the cabin, but also an issue of the aerodynamic drag caused by the energy expended to move air in and out. Following are a few examples of steps I took when "finishing" my RV-12.

SEALING THE VERTICAL STABILIZER

The RV-12 was designed so that vertical stabilizer butts up very close to the flat top skin of the fuselage tail cone. Close, but not in contact. In keeping with the aerodynamicist's dream of keeping the outside and inside air away from each other, I devised a passive seal. It would be easy to apply a bead of proseal



or RTV into this seam, but that could make removing the vertical stab difficult. To form a passive seal, clean and mark the upper fuselage skin when the stab is trial fitted. Then apply a small bead of proseal to that skin. Coat the lower edge of the stab. Skin with PVA or good wax. Bring the stab down into place and secure with the prescribed fasteners. Wipe off the excess proseal to form a small fillet as shown. After it is cured, it can be painted along with the adjacent skins. In the photo shown here, the skin was left un-painted, so the seal was painted silver, using a small artist's brush, to approximately match the aluminum color.

If and when the stab is removed, the seal should part from the skin end that had the parting film on it. This can be tested by pushing down locally on the fuselage skin, flexing it enough to part the seal strip from the stab skin. This seal is certainly not necessary and probably has more aesthetic than aerodynamic benefit, but it worked for me.

SEALING THE BAGGAGE BULKHEAD

So you think that your RV cockpit or cabin is well sealed? Now that winter is here and OATs have minus signs preceding them, I bet that you are now noticing little air leaks which just were not detectable before. One very important aerodynamic fact that can easily be overlooked is the air flowing forward in the rear fuselage. The aft portion of the fuselage, basically anywhere aft of the widest point, is what is referred to as a "pressure recovery area". Conversely,



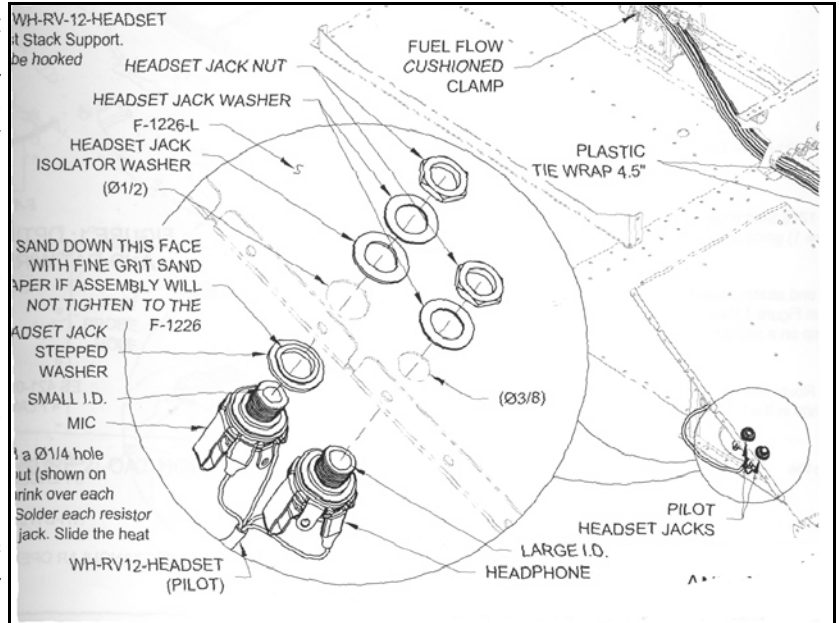
the cabin area of the fuselage is in a high slipstream velocity, reduced pressure area. Thus, any openings in the aft fuselage will leak air inward and the openings in the cabin area will leak outward. The cold air in the aft fuselage will flow forward and into the cabin through any opening that exists. But, how can that happen with the baggage bulkhead separating these two areas of the fuselage? The baggage bulkhead is not as air tight as it may appear to be. The stiffener ridges in the bulkhead leave openings through which a medium size mouse could pass, to say nothing for millions and millions of cold air molecules trying to get into the warm cabin. Sometimes when flying your RV-6,7, or 9 on a cold day, reach your hand back into the baggage area and feel the air coming in through those louvers.

The fix is easy. Just plug those holes. The best way is probably with the bulkhead removed. Cut little triangular bits of foam and bond them in with spray-on upholstery adhesive. (3M General Purpose 45, or similar). As a quick, perhaps temporary fix, you can just shove the foam into the opening ends with the bulkhead still screwed in place. Then next spring when you remove the bulkhead for annual inspection, the foam plugs will fall out and you will have forgotten about them because they are no longer needed. For the RV-12 bulkhead shown in the accompanying photo

tos, I used pieces cut from a scrap of soft temperfoam I had laying around my shop. Its elastic properties seemed well suited for this purpose, and its high quality should offer long life. (Some grades of foam rubber turn to powder after extended exposure to sunlight).

SEALING THE STEP

Where the cabin step enters the fuselage, there is a small opening which looked like it might vent cold air into the cabin. Plus, there was a small aerodynamic irregularity on the aft side. This was only visible from under the fuselage, but enough to offend my aerodynamic sensibilities. There are probably numerous ways to seal and streamline this detail. I chose to seal the opening with silicone (household variety). I used two separate applications because of the required thickness of build up. After thorough curing, I trimmed to an approximate streamlined shape with a sharp knife.



FRUSTRATING PROBLEM — SIMPLE (THOUGH ELUSIVE) SOLUTION

Among the little glitches I found on my RV-12 was a problem with the headsets/radio/intercom system. I include all segments of the sound system in this discussion because, being a mechanical nerd rather than an electronic geek, I never know which component to point the finger at.

Anyway, from the time I first threw the master switch on, this "system" didn't work right. With one headset, I could get no sound at all. With another, I could get a weak signal. The third one I tried worked fine! On some occasions I would get a loud squeal in the headset which could be silenced by pushing a button on the EFIS. That presented more than enough variables to severely challenge my aging brain cells. I tried all sorts of settings on the pot and on the ANC headsets, checked continuity on all lines (well, almost all), dismantled the intercom box, etc. Nada!

Since one type headset worked, I postponed further efforts until later. "Later" came after some hours of flying and grouching about this anomaly to any intelligent person who would listen. More than a couple of them suggested that I should check the grounding of the headset jacks to the airframe. I couldn't remember if I had checked this, but I rationalized that it couldn't be the problem because, after all, one headset worked fine.

I finally checked the headset speaker jack ground and I now have egg (ostrich size) on my face. I had misread (under-read, with a bit of dyslexia thrown in for good measure) the instructions and illustrations and had insulated that jack rather than grounding it. But, if the headset speaker jack was not grounding, why did one headset work well? I needed to find a figurative crying towel with which to wipe some of that egg from my face. Somewhat by accident I found at least a par-



tial answer while plugging and un-plugging the various headset options. On the one that worked well, I found that BOTH the mike jack and headphone jack needed to be plugged in! Normally, the headphone will work whether or not the mike plug is in its jack. Apparently in that particular headset, the speakers would ground through the mike jack as well.

You electronic geniuses probably understand this very well, and I probably couldn't understand it even if it was explained to me — again. It doesn't really matter now that I have the system working well. The lesson is that one should not overlook the simple solution possibilities. I was so certain that there were legions of mischievous electronic gremlins lurking in the various levels of circuitry that I overlooked the real culprit. A classic case of not seeing the forest for the trees.

SAFETY CORNER

TURF, SNOW AND ICE... TIPS ON WINTER FLYING

VAN

I know, turf runways now represent the home bases for only a small minority of RV pilots. They are nice places to land and take photos in the springtime, but otherwise seem to be just an impractical throwback to early-day aviation. Those of us based on turf strips come to know their seasonal and weather related peculiarities. Pilots lacking that familiarity should use caution when landing on turf strips "off season". They can be soft, slippery, or both. After thawing from a frost, the surface of a turf runway can be muddy and slippery. Depending on soil composition, this mud can easily completely fill and clog wheel fairings. Excessive wheel drag could cause nose over tendencies. The mud filled fairings could easily freeze after climbing a few thousand feet into colder air. They would not likely thaw out fast enough on landing descent, and would become very effective brakes. So much so that a nose-over would probably ensue.

In instances where long period of freezing resulted in deep frost, spring thawing results in very deep mud; too deep to land or taxi on. Beware! The grass may look green and inviting, but if you land soon after a thaw, you might find yourself sunk in to the axles. Since no other machine can get enough traction to pull you out, your airplane may have to stay there until the sod dries.

Even when a turf runway is firm enough that the tires do not cause ruts, it's possible to be so slippery that braking is minimal and steering problematic. When brake steering is the only option, as on the RV tri-gear models, you gotta plan ahead and not rely on the ability to make sharp turns. When the surface is really slick, tires will slide sideward almost as easily as rolling forward. Some years ago when I had a "G" model Bonanza I experienced this. On the takeoff roll, it would veer to the left even though I was applying full right rudder.

And that was in an airplane with positive nose wheel steering? I soon figured out the problem: the P-factor of that large, relatively low RPM prop was enough to slide the nosewheel sideways. At low speed, the "V" tail rudder authority was apparently not sufficient to help keep it going straight. I remember aborting the take-off a couple times, and then succeeding by applying power more gradually to limit the "P" factor.

When runways and taxiways, whether hard surface or not, are covered with packed snow or ice, they offer almost no traction for braking or turning. On pure ice, taxiing a tri-gear RV could be very difficult. The nose wheel depends on the force of differential braking to turn and if that force is diminished by ice, the turn may not happen. Certainly, don't count on braking for stopping quickly. Allow a lot of runway for roll out and plan to make gentle turns onto taxiways.

NEW PRODUCTS



STALL WARNER

We now have a simple vane type stall warning device available for RV-7/8/9 (RV-4/6 under development). It includes a tone generator, hardware and wiring, and installation instructions. It's already included in wing kits currently shipping.



NUTPLATE CHANGES

One of the mainstays of RV construction is the humble K-1000-08 nutplate. After decades of looking like the nutplate on the right, suddenly they were delivered looking like the nutplate on the left.

Do not panic.

Do not call Van's.

They are interchangeable.



Oscillating Ammeter Problem

FRED MEYER 22153

I have a Van's shunt ammeter system and voltage regulator ES-MS-150A in my RV-6A. Since day one, the ammeter has oscillated, going plus-minus full-scale deflection at start-up, then settling down to a "quivering" oscillation at higher rpm. My shunt is mounted on the firewall, and the voltage regulator is mounted on the instrument panel sub panel on the RH side. The red/green wires were neatly twisted together.

I am a retired electrical/electronics engineer, so finally, I just had to determine what was going on. After placing capacitors across various suspect points in the circuit with no significant improvements, I used a scope to look at the waveform across the ammeter shunt. They indicated no diode problems in the alternator. I then borrowed a Cessna voltage regulator and temporarily wired it in. Ammeter readings were normal. So I concluded I had a bad regulator

Wrong.

I reconnected my original regulator without bothering to twist the two green and red wires as they were before...and **my problem went away**. Conclusion - the two wires from the regulator are: green- field winding, red - 12 volt bus reference. Being twisted apparently caused coupling between the field signal (I assume digital) and the 12 volt bus causing the problem. I have encountered all sorts of weird EMI (electromagnet interference) and ground loop problems, not in only 3 inches of twisted wires!

I learn something new every day.



HIGH NOON APPROACHES

On February 1, 2010, at high noon Pacific Time, prices for Van's airframe kits will be adjusted. That's nelly-talk for "go up." Customers may avoid paying the higher prices by faxing/mailing in complete airframe order kits, accompanied by a deposit in US funds. Orders received on or after noon Feb. 1 will be accepted at the higher price. Past experience has taught us that there will be a rush of orders as the date approaches. Customers should expect longer-than-usual lead times. They can minimize the effect by:

1. Ordering as soon as possible.
2. Filling out the order forms completely and accurately. *Completely and accurately.*
3. Including a deposit or payment method (CC number and expiration date) *with* the order.

If you were planning on ordering a Sensenich prop in the New Year, it's already too late. An unexpected letter from Sensenich, received December 28th, forced price increases on both O-320 and O-360 props. Still, \$2600.00 for a brand new aluminum propeller with the extension and bolts doesn't seem out of line, especially when we still offer buyers \$1000.00 off the bottom line if they order a new engine and propeller at the same time.

GETTING THE LIGHT SPORT INSPECTION CERTIFICATE

KEN SCOTT

IN the Experimental Amateur-Built world we've become familiar with, an airplane builder can apply for (and almost always receive) a Repairman's Certificate. For that one airplane, he becomes "god" and can sign off all maintenance, repairs and modifications. That privilege remains with the builder. It cannot be transferred if the airplane is sold, and it's not good for any other airplane, even if it is an airplane of a similar type. In other words, a Repairman's Certificate issued to the builder of an RV-7 applies only to that specific RV-7 – not all RV-7s.

It's different in the Experimental-Light Sport Category. The Repairman's Certificate is not automatic. Instead, FAA regulation §65.107 allows the owner of an Experimental Light-Sport Aircraft to earn a Light Sport Repairman-Inspection (LSR-I) rating by attending an FAA-accepted course. Successfully completing the course allows an owner to perform the annual condition inspection on any Experimental-LSA airplane he or she might own now or in the future. If the airplane is sold, the new owner can take the same class and enjoy the same privilege.

Rainbow Aviation, located in Corning, California, has developed and certified such a course, and when it came to town – well, to Independence, about forty miles away – I signed up. On the day, I saddled up the family Prius and drove to class – I hated to do it that way, since I live on an airport and the class was held on an airport. But in the short days of winter, an eight hour class day meant flying home well after dark and landing on an even darker grass strip marked by just two lights on the far end. I tried that once when we'd first moved in and decided the risk/reward ratio wasn't good enough for me.

Rainbow Aviation is Brian and Carol Carpenter, who both have all the necessary letters after their names to assure you that they really know their way around airplanes, flight instruction and maintenance. They divided the sixteen participants into two blocks of eight, and after introductions were made and donuts consumed, we got underway.

Rainbow's materials were well prepared, and really, the class is not terribly demanding. Local RV builder Dave Martin drove his new RV-12 over from his house across the street and parked it in the hangar with the

cowl off. Carol led us through some of the paperwork basics (Question: Who can perform maintenance on an E-LSA? Answer: absolutely anybody, including the Trunk Monkey. Question: who can sign off work as airworthy at the annual condition inspection? Answer: an A&P, a Light Sport Repairman with a Maintenance rating, or the owner with an LSR-I rating.)

Brian took us through the basics of what makes an airplane fly, and the principles behind both two-stroke and four-stroke engines. I thought I knew all this stuff, with the possible exception of two-stroke theory, but still managed to learn a thing or two.



Brian Carpenter explains the innards of a Rotax.

The most valuable part of the course for me was the practical demonstrations in the hangar. One group at a time we followed Brian into the hangar. Brian has an impressive collection of damaged engine parts that will make a true believer out of the most casual mechanic. Since RV-12 maintenance at Van's is performed in the prototype shop – off-limits to us office droids – and I'm still a few months from the Powerplant kit on my RV-12, I'd never gotten my hands dirty on a Rotax. Watching the throttle linkages move was educational – the stops are small and an aggressive hand on the throttle can damage them – hence the stop built into the cables Van's supplies with the kit. The choke lever in the cockpit operates an enrichment circuit, quite different from the air-blocking choke plate those of us who are old enough to remember chokes in cars recall. The carbs themselves are very different from those on traditional aircraft engines. Piston to cylinder clearance in a Rotax 912 is .001"! No wonder they insist on a thorough warm-up before applying takeoff power.

It was good to get a mental image of what was happening under the hood – I can fly the airplane with more understanding now.

At the end of the second day we took a simple multiple choice test. Everyone passed, and we all went home with completion certificates that we can take to the FSDO and get our LSA-I cards when our airplanes are ready to fly.

2009 YEAR IN REVIEW

2009 – not a great year for many. Economic woes beset business and individuals alike. Van's certainly felt it as well. Throughout the year sales went up and down with economic news, foreign exchange rates, and the phase of the moon. Scheduling production, both for us and our suppliers, became difficult in the face of whip-sawing demand. The fourth quarter of 2009 was quite strong, (one of our strongest ever, in fact) which we hope is a good sign for 2010.

Compared to, say, auto or financial companies, we have a couple of good things going for us. First, we have a loyal customer base. There are several thousand RV builders out there pursuing a life-long dream with dedication and perseverance. They weren't going to give up easily – plenty of sacrifices and adjustments were made to keep the dream alive. Second, there are no fat-cat executive bonuses awarded regardless of company performance – Van's is employee-owned and if the company does well, we all do better. If it doesn't, we all suffer – call it motivation. Third, we had the right airplane at the right time: the RV-12. The FAA dither over the Experimental Amateur-Built category (finally resolved late in the year) didn't affect the Light Sport category the RV-12 was designed to meet. When final prices were determined, we found we could provide a complete airplane kit – not just an airframe kit – for

The RV-12 prototype cavorts in sunny skies.



South African RV guru Chalkie Stobbart as he broke one of the oldest records in aviation: Alex Henshaw's London-Cape Town-London epic. The fact that Chalkie -- a man who's tirelessly worked for safe flying practices and been a stalwart ambassador for RVs in his country – flew a GP-4 didn't matter. It was a great piece of airmanship. Some time in 2010, Steve Noujaim (cover boy on Van's 2010 calendar) will attempt to break Chalkie's record, using his RV-7. We'll watch that effort with the same interest.

2009 begins



\$60,000. A brand-new airplane for that sum proved very attractive, even if it came as a kit. After all, fly-away S-LSA airplanes were selling for more than twice as much. When potential builders considered that they were effectively paying themselves \$75 tax-free dollars an hour for about 800 hours of enjoyable work, the deal became irresistible. By the end of 2009, 320 RV-12 kit starts had shipped, and about 16 were flying. We expect they will start sprouting like dandelions this spring.

After what seemed like a prolonged and frigid winter, we kicked off the flying season with the usual long flight to Sun'N Fun in Florida in April. Gus, Rob and Daryl flew the RV-10, Rian Johnson flew his own RV-7A and we trucked the new red RV-12. The RV-12 in particular generated a lot of interest.

In May we stayed glued to our computers, following

Chalkie Stobbart breaks Alex Henshaw's record



Mid-summer arrived in June and suddenly RV QuickBuild Kit deliveries slowed to a crawl when a long-scheduled facility move in The Philippines ran afoul of local politics. After a lot of extra work on both sides of the Pacific, the problems were resolved (despite predictions of doom on various web chat sites) and QB deliveries resumed. It took a couple of months to clear the backlog, but the supply chain has functioned smoothly ever since.

July is the center of our business year. In 2009, there were two major milestones on the RV-12 program. We received the S-LSA certification for the airplane and Mitch Lock, our new East Coast representative finished and flew his RV-12; the first to be completed outside our shop. At the end of the month came Oshkosh – AirVenture, I suppose we should call it. Before we fired up the engines in Oregon, we checked weather and learned that the Chicago/Milwaukee/Oshkosh area was having its coldest summer in a cen-



Mitch Lock and New Blue.

ture. Oh, thank god, we thought, and launched. Sure enough, the weather enroute and at the show was as pleasant as any year we could remember. We were all hoping Mitch could get his airplane, dubbed "New Blue", to the show, but there just wasn't enough time to fly a complete test program and prepare the airplane for a long cross-country. Wisely Mitch decided not to push things, and flew his RV-8.

We held the traditional RV banquet on the field and enjoyed the evening as vansairforce website founder Doug Reeves received the Bax Seat Award for aviation journalism. Featured dinner speaker was RV-8 builder Terry Lutz, who works for Airbus and brought the new A380 Immensiti to the show. His Airbus flight crew partner had built a CriCri, and all three airplanes were parked together. I had the momentary thought that this was probably the first time in Oshkosh history that two homebuilders could start three engines and perform a formation takeoff *inside* the airplane they'd arrived in...

Out in the dedicated parking area, well over 400 RVs sat wingtip to wingtip, row on row. Official aircraft registration is voluntary, so it may not mean much, but one source told us that more RVs registered their arrival than Cessnas! Imagine.

To celebrate Van's 37th year at Oshkosh (not to

mention Rockford before Oshkosh and Milwaukee before Rockford) Stu McCurdy led a 37-ship RV formation that included Van's Joe Blank. It sure looked good from our booth.

September: the first truly customer-built RV-12 flew when Brad Stiefvater piloted N124BJ into the skies of South Dakota. This happened about 18 months after the first RV-12 components shipped, which was pretty satisfying. Not many new kit designs turn into flying customer-built airplanes that quickly.

In our own shop, another RV-12 was under way. Sponsored by several businesses, individuals, foundations, Project Teenflight took off under the direction of prototype supervisor Scott McDaniels. A dozen teenagers and their families committed to the program. By



Brad Stiefvater flew the first customer-built RV-12.

the end of the year, tail surfaces and tailcone were finished and the wings were under construction. You can follow the progress of the project on www.teenflight.blogspot.com. It's exciting to see young people dig into a project this big and make something very real happen – no video game or virtual reality here.

In October, Van celebrated Halloween without the mask and candy – he flew his new RV-12 "Silverwings." He can now show up fly to work in an RV-4, RV-10 or RV-12 or – if he likes – his Antares electric airplane.



Terry Lutz brought both his airplanes to Oshkosh.



Project Teenflight assembles their RV-12 tailcone.

We can only sympathize with such commuting woes.

At the end of the year, we observed a few milestones: our demonstrator RV-9A had rolled over 2000 hours. The red RV-12 finished the year with over 300 hours. Our RV-10 passed the 1000 hour mark some time ago and now has 1303. Our RV-7A needed somebody to put six more hours on the Hobbs to hit 1800 total time...any volunteers?

About 550 new RVs flew during the year. That's down slightly from the last two years, but it still represents an average of about 1.5 per day, every day of the year. Most aircraft manufacturers would be thrilled with that, and we are too.

After calculating that, we walked to door on the last day of the year...into a surprise snowstorm. It didn't take too long before the runways and parking lots looked just the way they did on the first day.

We are grateful for the support of our customers in 2009 and hope for a better year for all in 2010.

Van and "Silverwings".



2009 ends.

RV-12 UNAVAILABLE (TEMPORARILY) FOR DEMO RIDES

We are making a couple of prototype installations on our sole RV-12 prototype — wheel pants, for example. The rules we operate under require the aircraft that be taken out of the S-LSA category temporarily and placed into a Research and Development category for the duration of the flight testing. After confirming that the modified aircraft conforms to the certification requirements it will be re-certified S-LSA.

This means that the aircraft will not be available for demo flights while it is certificated R&D. We chose to test these installations in the winter, when there is little demand for demo rides. We cannot predict exactly how long it will be before the airplane is available — how fast we can complete the test program that depends on Oregon's winter weather. See photo above.

If you just gotta fly an RV-12 before ours is ready, contact Mitch Lock at mitchl@vansaircraft.com Mitch's airplane "New Blue" stands ready in its hangar in Maryland.

If you want to fly an RV-12 in warm weather, well, good news! The **U.S. Sport Aviation Expo will be held in Sebring, Florida January 21-24.** Mitch and his RV-12 will be there, along with airplanes from many other LSA manufacturers. (This will be the first time the RV-12 has attended an all-LSA show, and we're interested to how it fares against the showier, much more expensive, S-LSA airplanes that have received so much press.)

