



A beautiful RV-9A, built in The Netherlands by Rens Verhoeven.



Now, this just begs for a caption contest!

Van's engineer Rian Johnson flew his own RV-7A to Sun 'n Fun and this happened.

Send us your best caption, preferably in an e-mail with 'caption contest' in the header. The winner gets a pair of Van's hats, autographed by Van himself. The decision of the judges, however capricious, arbitrary or unpredictable, is final.



Grant Krueger took this photo at Mandeville, on the South Island of New Zealand. I think I know what it is... or will be. What's your guess?

COOL MACHINES AT VAN'S

KEN SCOTT

When you say “cool machines at Van’s” everyone who’s had a shop tour immediately thinks of the big punch presses whacking their way through miles of aluminum sheet, changing bits on the fly and punching hole patterns accurate to a couple thousandths of an inch. Punch presses are pretty high on the “cool” scale, but there are quite a few other machines in our production shop that score just as well. Some of them are big and bolted to the floor, some of them are small and hide under benches until they’re needed, but all them allow us to do very specific jobs quickly and accurately. Here’s a look around.

ABRASIVE PLANER

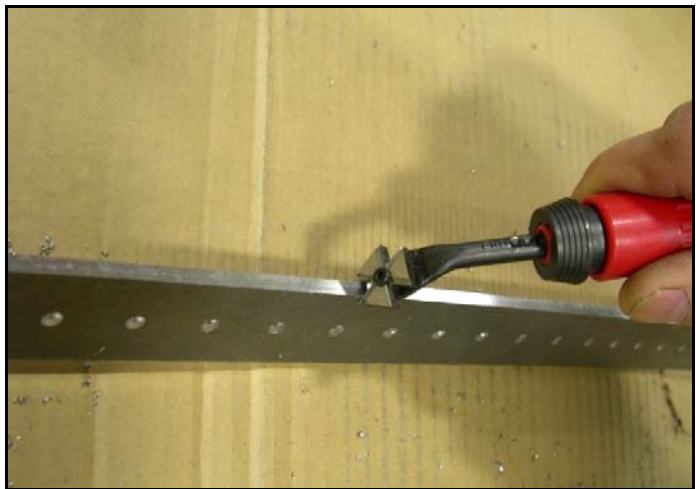
The big, black, cubical beast in the center of the floor is an abrasive planer. It’s essentially a big sanding drum turned on its side with an adjustable table traveling beneath it. The table is capable of very fine vertical adjustments, just like a wood-working planer. We have lots of long, flat items – like the punched doublers and bars that go into main spars – that take considerable hand-work to prepare them for anodizing and assembly. With an abrasive planer, we could do the work more consistently and far faster. New, though, they are quite expensive and our volume of work couldn’t quite justify the expense.

We had a stroke of good luck when a local barbecue manufacturer went out of business. We bought quite a bit of their warehouse shelving, worktables, and assorted small equipment. While we were scavenging, somebody – probably Tom Green, who has a deep affinity for arcane machinery – saw the abrasive planer sitting forlornly in the corner and realized the potential. It had been used hard and put away wet. The interior was clogged with rusted steel sanding debris and the table was in sad shape. It still worked, though, so we bought it and tossed it over to our guys. Shelby Haak, Tom Hutton and Bill Bobbit spent a couple of really filthy weeks cleaning, repairing and tuning it up. Now the abrasive planer is equipped with a medium grit



Above: it may not be beautiful now, but you should have seen it when we got it. Guys in our production shop completely rebuilt this abrasive planer and now we use it to clean and finish spar components.

Right: Even with all the machines, there’s still work that is best done by hand. This 6-blade deburring tool dresses the edges of spar bars quickly and accurately.



Scotchbrite belt and happily back at work in a far cleaner environment, putting a beautiful finish on RV spar components.

HAND DEBURRING TOOL

The abrasive planer won’t break the edges of the spar bars and waffle plates. This work is still done by hand, using a special three-blade deburring tool. Actually, it’s six-blade as each blade can be reversed. It bevels two corners of a piece of bar stock in one pass. At least for the first few dozen bars, it’s actually fun to use – kind of like a sharp wood plane. There’s a very satisfying ‘schweeep’ sound and long shavings peel away.



TUBING BENDER

I love watching this baby in action. Put in the right die, dial up the right pressures and watch it convert a thick wall 4130 tube into a pair of swoopy RV-10 control sticks. The RV-12 requires an exhaust system unique to the airplane. This machine makes it possible to manufacture the necessary parts completely in-house. (Take a look at the price of European-made original equipment exhaust systems for other LSAs and thank us later.) RV-12 fuel filler necks, canopy frame components...we are still discovering new things an airplane company can do with a tubing bender.

DESIGNED IN-HOUSE

Not all the cool tools at Van's come from tool factories. Some of the coolest are made right here. In-house tool making, something we've always done to some degree, took a step forward under Bruce Reynolds (VAF, Ret.) and was handed off to Mike Ekstrand at the beginning of the year. Mike works in the background as far as most RV builders are concerned, so if you don't recognize the name it's not surprising. He has an extensive electro-mechanical background, designing and building machinery used in industries from food processing to spacecraft. Some of his work made it to --and



functioned well on -- Mars! After long stints at McDonnell Douglas and Composite Optics, Mike moved to Oregon to take a job with Lancair where he worked on their high-performance Evolution.

Entering the kit aircraft world through that job, he met lots of RV pilots at workshops and became familiar with Van's products. "I'm an aluminum guy at heart," he says, so he crossed the Cascade mountains and joined us.

He was immediately assigned several tasks in the production shop, designing tooling and fixtures that increased the accuracy and speed of many operations.

RIVETING YOKE

We also assemble RV-12 center sections in-house. Riveting them requires a deep throat and a powerful "squeeze." Tom found just the tool at a local business that specializes in used equipment.

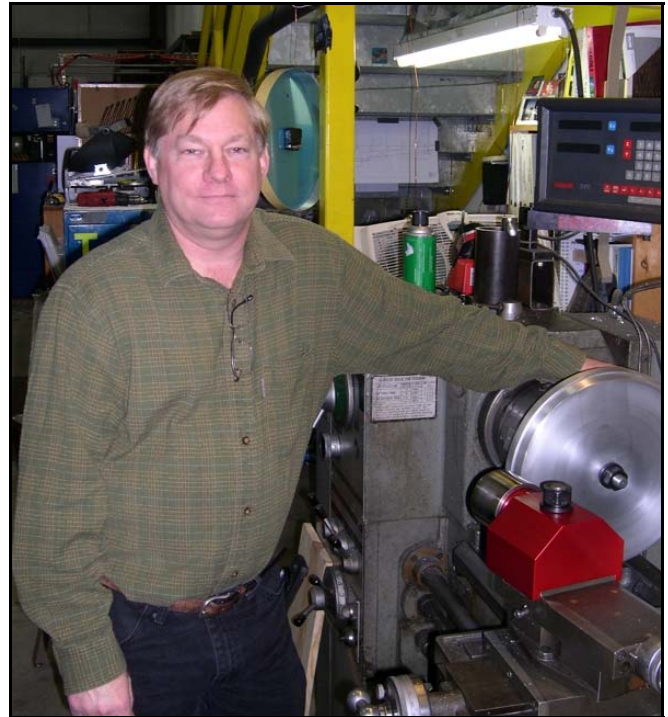




Top: a massive yoke on the pneumatic floor riveter reaches all the driven rivets on an RV-12 center section.

Bottom: a stack of completed center sections, hot off the riveter.

Top right: Mike Ekstrand with his spinner spinning setup.

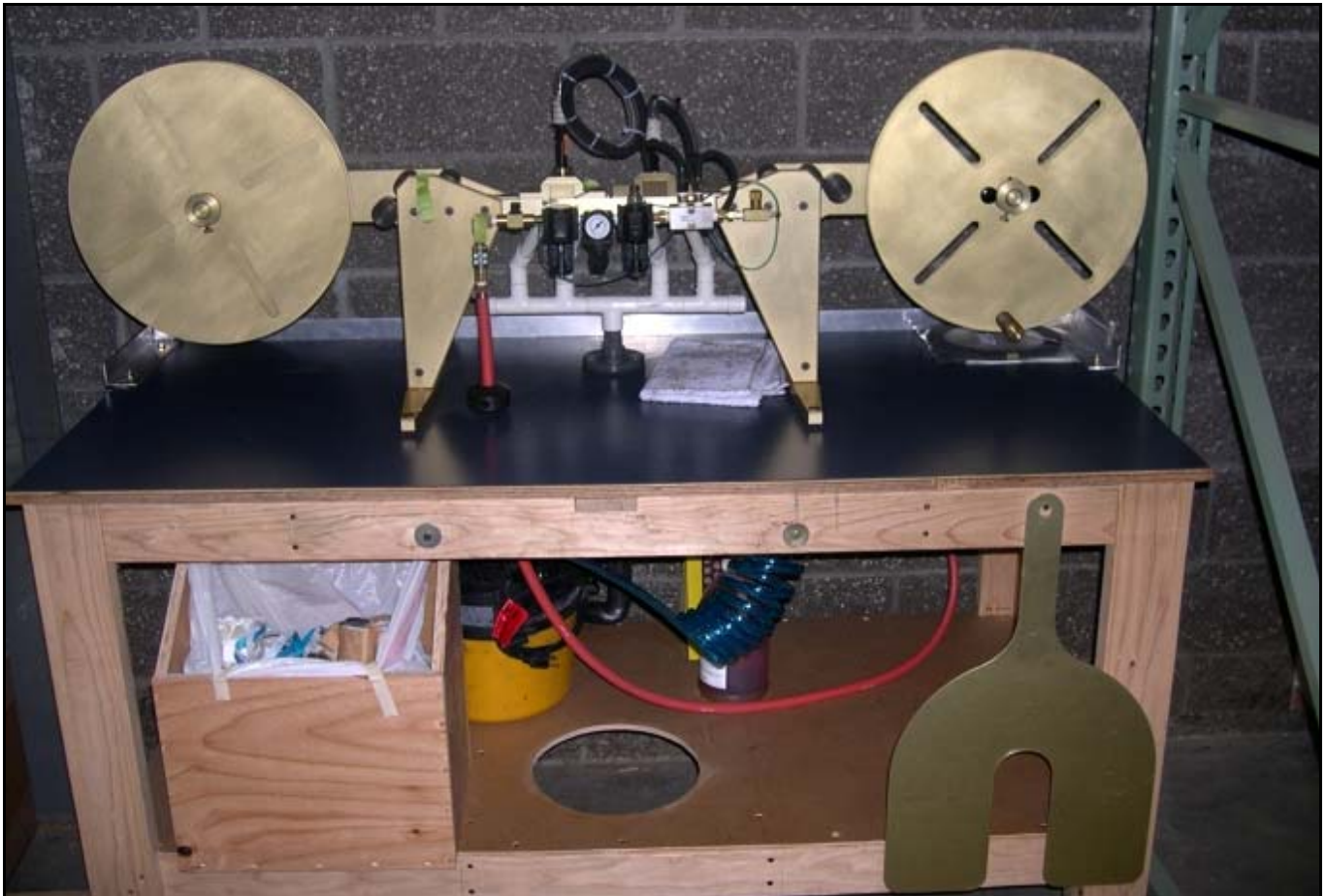


It's a large pneumatic riveter with a powerful hydraulic ram. Our machine shop refurbished it and Mike built a special, very heavy, yoke that allows access to all the corners of the assembly. James Peterson is the man in charge here, carefully taking the machined aluminum channels that form the heart of the RV-12 fuselage and riveting them to the formed sheet aluminum components that make up the rest of the center section.

Mike also designed equipment that improved our ability to make spinner plates. These flanged discs are turned over a form block on a big lathe. It takes some accurately indexed and very strong tooling to resist the forces of the whirling block. Mike made a massive arbor/roller that folds the flanges over against a form block as the lathe spins. The result is a beautifully formed spinner plate, accurately circular, with even flanges and no "dish" on the web.

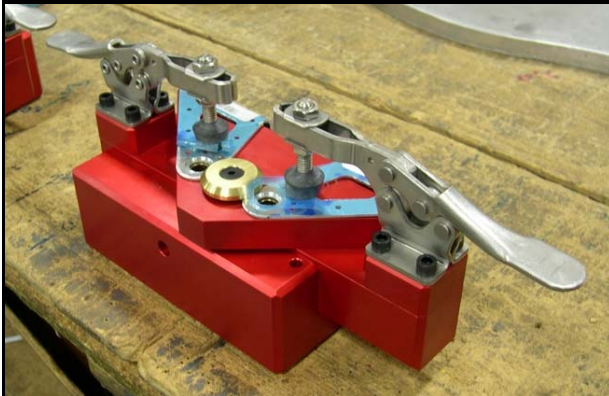
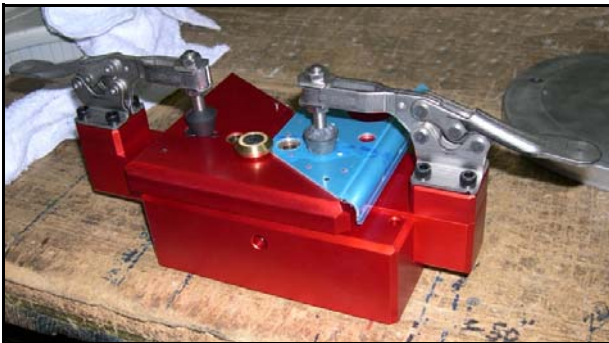
"SMALL" JOBS

Early RV-12 builders will remember that some parts counterbored to fit around bearings actually put the bearings in a bind when they were riveted together. Within weeks of that discovery, Mike had designed new tooling and processes that eliminated the problem. A large and very stable aluminum block is fitted with pins that index to pre-punched holes in the part. An accurately located bushing in the block centers the counterbore bit in the bearing hole, rather than relying on the part itself. The whole apparatus is designed to be mounted on a mill. When the fixture holds the parts and the counterbore tool in the mill chuck centers in the bushing, the result is finished parts so accurate that the bearings rotate like they're soaked in butter.



Above, the weatherstrip cutter complete with reels and a vacuum system. Beautifully made from machined and anodized aluminum.
Left: one of Mike's counterboring jigs. The pins that fit into the pre-punched rivet holes in the part and index the part to the jig are just visible behind the part.

Left, below: a similar jig for aileron brackets...left and right.



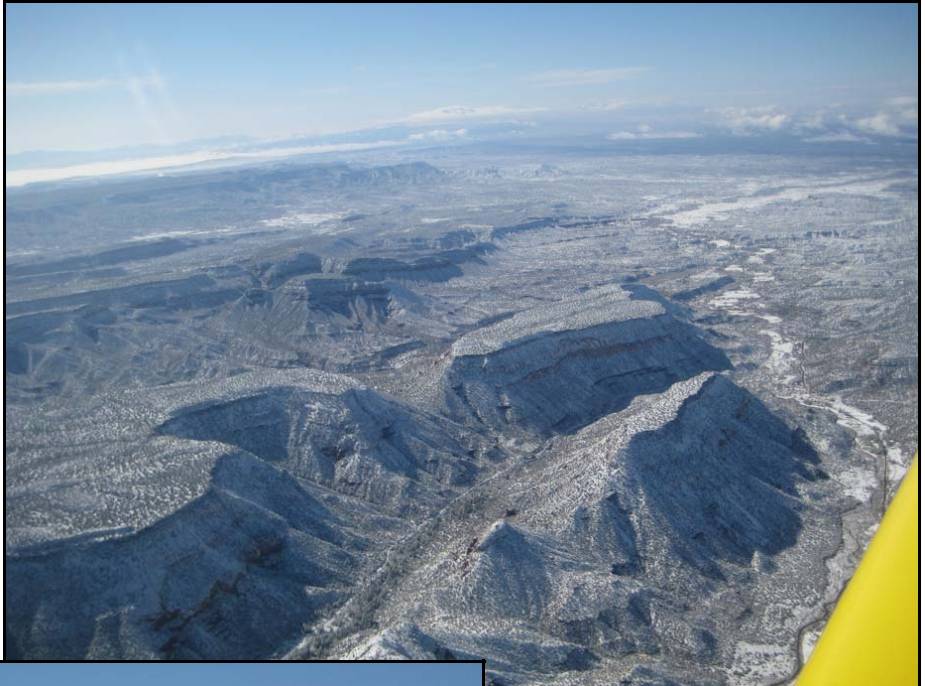
It's surprising what tasks turn out to be the hardest. The RV-12 required a strip of soft weatherstripping with one corner trimmed off a rectangular cross-section. Ever try to evenly trim one corner of a soft, squishy, wiggly strip of foam that's only about 3/8" wide to start with? It ain't a job for your X-acto knife. Mike came up with "Mickey" – a really cool gizmo with rotating reels to feed and retrieve the strip, an abrasive cutter to trim the corner and a vacuum manifold to clean up the residue before it creates an air hazard. This was his first custom-made machine for Van's, and he used it to make a statement. It's beautifully built and finished to a very high standard. Everything is machined to close tolerances and gold anodized. Mike may regret doing something so nice so soon – now we expect if out of him!

He hasn't had any problem living up to those expectations. Mike builds a really pretty tool. He says all the colorful anodizing is there to make it last longer and wear better. Maybe, but we suspect it's also the result of an aesthetic, artistic sense. His latest project is a production drill jig that exactly locates the wing pins in RV-12 spars. Anodized an ox-blood red, it's just as pretty as every other tool he's built.

We get to enjoy the precision and satisfaction of using these tools. The customer gets the real benefit, though, in parts (affordable parts...) that fit better than ever.

It's rare to have a weather-free 2200nm trip across the country in April, but this year's trip to S&F was plagued by a little more weather than usual. Our crew of Daryl, Rob, Joe, Rian and Gus had a delayed start due to rain and low ceilings at Aurora, but made it as far as Farmington NM for an overnight stop.

After chipping ice off the airplanes the next morning, we headed south and more south, finally running up against a line of thunderstorms near Dallas the next day. Luckily we were able to make it as far as Northwest Regional airport on the outskirts of Ft. Worth. There vansairforce.net maven Doug Reeves, with the assistance of the gang of local RV guys, who fixed us up with rides, a hotel and food. Thanks to all of them who helped



A lot of the Southwestern USA looks like this (above) which is why it's desirable to have one of these (below) if you're going from Oregon to Florida. All the sunny weather and great visibilities didn't last, though.



out. Next day, we were dogged by the same weather system, but managed to climb on top, and aided by good tailwinds arrived at Lakeland just prior to the car rental lady's quitting time on Sunday evening.

Rian Johnson, flying his personal RV-7A and plugged into his 3-day-old iPhone, spent a good portion of the trip crowing about 3g connectivity over some desolate wastelands. Between that and the Garmin 496

"borrowed" from the RV-12, we had a better picture of weather ahead than in previous years. We're not sure if it was the iPhone or RV-7A which attracted the girls, but attendance at the booth picked up when Rian's new friends showed up (see p. 2).

Our East Coast rep, Mitch Lock also arrived Sunday, having had a smooth and easy flight down from Maryland. Next day, we reassembled the RV-12 that had traveled down in the Partain trailer. The show this year seemed as busy as in previous years, though it appeared that the number of airplanes flown in was down somewhat. Booth traffic appeared to be about the same as last year, and overall attendance seemed to be about the same as last year. Everyone was disappointed by the absence of the jet pack guys – Daryl is just itching

to fly one – but maybe they'll be back at Oshkosh.

Mike Seager and Joe Blank took care of the demo flights in the RV-7, 9A, 10 and 12. We're hoping that Mitch will have his RV-12 finished soon, so we don't have to take the airplane away from the booth to give rides. Inevitably, people who came to the show for only one day showed up on the days it was gone. Swapping airplanes between LAL and Plant City airport compli-



Top left: the RV-12 sits in the Florida sun after a long, long ride in a trailer. This was late in the show, and the grass not directly beneath the airplane had been pounded into sand.

Top right: Daryl Sahnaw and Advanced Flight System's Kelsey Hickman share a birthday which always seem to fall at Sun 'n Fun.

Bottom left: If you're interested in a MiG-23, there's a deal waiting for you in Borger, Texas. Some of the cockpits are half full of water, but others could be opened. Ken Scott was gratified to see the panels were a beautiful baby blue, just like his RV-6. Smart, those Russians.

cates things compared to Oshkosh where we can do demo flights from the show.

The Friday night BBQ in a tent on the field near the museum was a success; most attendees prefer to have it at the show rather than off-field. We'll be doing this again at Oshkosh. This year we had lights in the tent, so weren't rushing to finish eating before sunset. Bob Avery of Avery Tools, grizzled veteran of many banquets, said it was the best food he'd ever had at a Van's dinner, which we chose to take as a compliment to the caterers.

The trip back went reasonably smoothly...until day two, when we woke up to fog in Borger, TX. It took until after lunch to clear, but that did give us a chance to check out a bunch of disassembled MiG-23s that some optimist had stashed there. These had presumably not yet found a

buyer, since the airplanes were gradually being reduced to dust by the prairie wind, sun and rain. I'll bet the people who built them in the Soviet Union never thought that they'd end up rotting away on small-town airport in the United States! Borger's other claim to fame was \$2.86/gallon avgas — the cheapest of the trip.

When we did get out and progress NW, the wind (on the nose, of course) was blowing hard over the salt flats, and dust was piled up near Spanish Fork, reducing visibility to a very few murky miles. The late start precluded getting to Oregon that day, so we had to spend another night on the road, this time in Wendover, NV. The next day we slogged home, fighting headwinds and dodging snow showers. The direct course over the Cascade mountains was not feasible, so we pounded across southeast Oregon to Medford, turned the corner and headed north up the I-5 corridor to Aurora. As usual, the trip had required the full range of clothing, from down jackets and gloves to shorts and sandals.

ONE WING LOW

Scott Risan gives up Chinese flying

I finished up an annual condition inspection on my RV-4 in February. The airplane was out of commission for about two weeks. As luck would have it, the only flyable weather during February occurred while the airplane was all apart. Oh well...it only lasted 15 minutes, so I didn't miss much!

The weather has improved since then and I started flying to work more often this month. An odd thing happened, however...

My RV-4 has always had a bit of a heavy left wing. When I fuel up, I automatically set the manual aileron trim handle to the right about an inch and switch the fuel selector to run off the left tank first. This has

me because over half the screws were gone! The aft screws were in place but most of the side and all of the forward screws were ...somewhere else.

About this time it dawned on me that I'd made a mental note to replace a bunch of the cover screws that were worn. (I should know better...*never* make a 'mental' note when doing aircraft maintenance. Write it down on your list of discrepancies and do not sign off the logs until all discrepancies are corrected!) I was surprised to find that the access cover was not bent – something I would have expected had it 'flopped' down into the airstream. Nonetheless, I'd had a similar thing happen while spraying in a Pawnee many years ago so I knew first hand what a loose fairing can do to airflow over a control surface. I screwed the cover down...with all the screws this time... and went and flew the plane. Hallelujah! It flew like the plane I knew and loved...with just a little bit of roll to the left.

Part II

A little bit of roll to the left...Hey, while I'm here, why not see if I can fix that once and for all. I had read and recommended the FAQ at Van's website titled "Wing Heavy Analysis" many times. It's a description of how to troubleshoot and fix a typical heavy wing on an RV. I knew that a small reduction in the trailing edge radius of the 'light side' aileron would probably correct my problem. I confidently strutted over to the left aileron and gently worked my way down the trailing edge with my thumb and fingers giving the entire span a light squeeze. When I



Adjusting a little roll into the aileron...

worked just fine for over ten years.

I made a few flights to work after the condition inspection and, while the plane flew just fine, it was displaying more of a left roll tendency than usual. It was taking full aileron trim to bring the wings level with an even fuel load. What's up with that?

This little change in handling had me concerned. Time to troubleshoot... I checked the rear spar attach fittings... they were solid. Flap rigging...correct. Aileron hinges and brackets...all looked good. Wing tips...secure. Gear leg fairings...straight and secure. Aileron rigging...AHHHHHHH! To check the aileron rigging, one has to remove the screws in the access panel on the bottom of the wing directly under the aileron bellcrank. This was especially easy for



And adjust some of it back out...



When all the back-and-forth got the better of him, Scott got out the "big adjuster." Fortunately, Cynthi stopped him in time...

reached the outboard end of the flap I heard a far-away voice inside my head, getting louder. It was yelling something like, "Hey, Bonehead! You're supposed to squeeze the trailing edge of the aileron on the light wing!" Yep, I'd just put the 'squeeze' to the heavy wing aileron...nice move!

I'm not one to panic and I really hadn't squeezed *that* hard so I decided to fly the airplane just to get an idea of how responsive an aileron is to this treatment. All I can say is. "WOW!" In cruise, it was now rolling noticeably harder to the left. I landed and squeezed down the right (and correct) aileron. I apparently squeezed too hard resulting in a heavy right wing on the subsequent test flight...good grief!

After 6 more 'adjustments' to the trailing edges of the ailerons (with test flights between each), I finally achieved 'RV nirvana'.

It's fairly easy to reduce the trailing edge radius with just finger pressure. From my experience, a person

would not want to use any kind of 'tool' for this. The response is dramatic!

During one test flight, the ailerons felt very 'stiff'. This resulted from me having squeezed the trailing edges of both ailerons too much. The remedy for this is to reverse the 'squeezing' process. Sometimes called 'bumping', a force is applied to the trailing edge, perpendicular to the chord of the aileron resulting in an increase in the radius of the bend at the trailing edge. Unlike the squeezing process, a tool of some sort is necessary to do this. My wife stopped me before I commenced with my first technique (see photo). I ended up using a couple of 18 inch 2x4s. I put the edge of one up against the trailing edge of the aileron and gave it a 'whack' with the other one. I'm sure there are better ways to do it but this method seemed to work well for me. Be careful with how much force you apply. As with the 'squeeze' sequence, I took the reversal too far and ended up with very loose and sloppy aileron response during the subsequent test flight.

The 'trailing edge' squeeze technique should be used as a last resort. Unless the roll tendency is actually caused by asymmetric trailing edges, it's going to be a 'patch' for another problem and most likely induce unnecessary drag. Changes in the radius of the trailing edge of an aileron should be made incrementally in very small steps. Fly the aircraft after each change to determine what effect it had. I was obviously overdoing it with the first couple changes I made. This ended up being a very interesting exercise. I learned a lot and eventually remedied the original heavy left wing condition. In hindsight, however, I'd have left the ailerons well enough alone.

All this reminded me of something I'd read, and with Alex Henshaw and his achievements on my mind (see p. 15) I hunted down my copy of Sigh for a Merlin. Henshaw served as a civilian test pilot at the Spitfire factory in Castle Bromwich and is reputed to have flown fully 10% of the Spitfires ever built. (He and his pilots often took off, in high-performance fighters that had never flown before, mind you, into 20,000' of cloud, climbed on top, conducted tests and found their way down.) Naturally, the brand new airplanes needed trim adjustments before they were sent to squadrons. Here's how he describes it:

"The ailerons were fabric covered and had to be flight rigged with short lengths of cord doped underneath or on top of the trailing edges. When we later received the metal-covered ailerons, the situation was much improved as we could then dress the trailing edges up or down, and did not have to rely on dope and cord for rigging."

The more things change...

PLASTIC BRAKE LINES

— a workable method found, then improved

A few grumbles surfaced lately when builders tried to install fittings on the plastic tubing used to connect the master cylinders on dual brake systems. These fittings rely on a compression sleeve around the outside and a small tubular insert stuffed into the end of the tube. The difficulty has been getting the insert into the tube, even when the plastic tube is softened in boiling water.

I mentioned this to Van during an “RV-12 builders conversation” the other day, and he told me how he’d done it: after heating the tube in boiling water he’d tapped the inserts in with a nail and a hammer. Van knows a thing or two about building airplanes, so I took his method home, adapted it a bit and found it worked perfectly. I had all the brake lines for my RV-12 prepared in about fifteen minutes.

Now, working on small soft plastic parts with a hammer just *offends* some people’s engineering sensibilities. When Ken Krueger heard this, he looked into the problem. What he found is the plastic tubing, as manufactured, varies significantly in wall thickness. Sometimes the inserts will push in with your thumb, sometimes they will actually be loose, and sometimes they fit so tightly it seems impossible to get them in. Ken’s method was simple and direct: drill the last ½” or so of the tubing with a #29 twist drill. If it pulls shavings out, the finished wall will be no thinner than the thinner walls resulting from production variation. If it doesn’t...well, there you are. In either case, the insert will insert -- no boiling water necessary.

The building plans/manual will be revised to include the “drill bit solution”. You can put shop coffee pot back to work making coffee.

SIDEWAYS

So, you’ve completed the structural construction of the RV-12 fuselage and it looks something like a wide stubby boat. Now it’s time to install the fuel and fuel return lines, along with the wiring harness and antenna cables way down there in the belly of the beast. This can be hard on the body, standing on a stool and bending over the gunwales to reach into the trough the lines run through. It’s difficult to see what’s going on down there too, because the side nearest you is always hidden. To see both sides, you have to trot constantly from one side of the boat to the other. Tiresome.

The solution, if you can’t bring your body to the work, is to bring the work to your body. Putting the fuselage on its side, resting on a couple of 34-36” high sawhorses, solves the issue entirely. Everything from the firewall to the rear baggage bulkhead is accessible



and at this height, you can pull a chair right up to the longeron and string wires in comfort. Tape over the lightening holes in the floor ribs to catch falling washers, add a cool florescent work lamp and a pad on the inside of the side skin to hold tools and you might as well be in your living room.

Van did his fuselage with the tailcone attached (when I saw it, it was resting on a table saw shipping carton with the new table saw still inside for ballast... does this qualify as a “sawhorse”?). Room constraints dictate leaving the tailcone off as long as possible in my shop, so I’m working with just the center fuselage, clamped to sawhorses.

Either way, working sideways is working easy.

No, not that one.... “Fiberglass”.

Fooled you didn't I? However the other “f” word may have at one time or another been invoked when working with fiberglass on canopy assemblies. The nature of their primary materials and function demands that canopies be built accurately and carefully. But RV-12 builders need not fear; the engineers and prototype shop guys have made this process as painless as possible. The canopy comes cut to size, save perhaps a bit of trimming in a few places. (It's possible that even this will be eliminated with more field experience).

Up to the point of molding the important fiberglass cover for the canopy pivot arms and windshield skirt, the entire process has been made as simple as possible. The fiberglass lay-up must by its very nature be done by the builder himself. RV-12 plans go to some lengths to present the job in a manner that can be followed and accomplished by a beginner. Those with extensive fiberglass experience may choose to apply some of their own acquired personal technique. As with many things, there may be more than one “right way”.

I won't even pretend that I could pass on “secrets” by which you could cut the time in half. It's not so much a matter of secrets as it is acquired skills at manipulating the resin brush and understanding the glass cloth saturation process and weave shifting process. Another factor is that I am wired to move fast when I work, particularly with fiberglass because of the often uncertain cure time for the resin. I'll mention a couple of basics which may help you.

BRUSH SIZE

I almost always work with a narrow brush, usually 1 inch, even for fairly large jobs such as a wheel fairing. I find that the precision with which I can work offsets the limited ability to transfer resin. Just move faster. The brush of choice is a cheap natural bristle brush commonly found at Home Depot, etc. These are basically throw away brushes, but can be cleaned with acetone and reused. Some advantages of cleaning and reusing is that your brush supply is not depleted as fast, which satisfies my sense of frugality and landfill conservation. Also, these brushes do shed bristles. This is not a problem during most lay-up work, as the bristle just adds a bit of fiber to the cloth and doesn't do any harm. However, when applying final surface coats of resin, you want to avoid bristle shedding. This is the time to use a used brush that has been cleaned several times. It has finished shedding (well, almost) and will apply a cleaner finish coat.

WETTING OUT PROCESS

Much time can be saved by mastering the glass



cloth wetting process. Epoxy resins are typically rather viscous and soak into the glass fiber threads slowly. It can be a frustratingly slow process getting the weave uniformly wetted out. The natural procedure is to apply a brushful of resin to an area of the glass cloth and thoroughly spread it around using the brush as a squeegee. Then, take another brush full of resin and progress onto the remaining dry areas of the glass cloth slowly from side to side, from center outward, or whatever. My technique is to apply the resin hastily to a general area of the cloth and spread it just enough to keep it from running off. Then, while this resin is taking its time to soak in, apply a couple more brushfuls of resin to adjacent areas. After these “puddles” of resin have self-saturated the cloth, quickly brush the surplus onto the surrounding dry areas. Dry spots between the puddled areas can be easily filled in as you progress over the entire lay-up area. It may look sloppy during the process, but the end result is the same as a slow, carefully, progressive wetting pattern. Also, where multiple layers of cloth are being applied in a single cure, you need not be fussy about getting a precise wetting of each lamination. The next layer of cloth will absorb

any surplus resin. Just worry about this as the final lamination is applied rather than repeating this level of care for each of what may be many laminations. Moving too slowly may permit the resin to cure and harden before all of the laminations have been applied. This really screws up the process, and provides more reasons to hate fiberglass. Even if you never come to love the stuff, try to understand it and make it work for you. I've seen too many builders try to fight fiberglass into submission. Trust me, this will not work; it will always win that battle.

A LEARNING EXERCISE

A big part of successful fiberglass lay-ups is understanding the way woven fiberglass cloth behaves. The cloth specified for most of the lay-up work on RVs is a rather loose weave. This permits it to easily conform to contours and to be re-shaped from the cut pattern. Though the fiberglass lay-up on the RV-12 canopy has modest compound curves, it's still helpful to understand glass cloth behavior. If you have not worked glass before, a practice session will help you. Cut two six-inch square pieces of 9 oz. cloth. Cut one piece parallel to the weave, and the other 45 degrees to the weave. Find a piece of scrap aluminum, heavy waxed paper, or some other non-porous material on which to lay these pieces and wet then with resin. Mix a small amount of resin; use a 1 inch natural bristle brush (cheap, throw-away variety), and wet out the cloth samples. You can observe the saturation and wetting properties mentioned above. Once wetted out, you can drag the brush cross weave over the cloth and re-shape it. You can also poke at the cloth with the brush tip for the same purpose. The cloth can be easily re-shaped and repositioned on the backing. You will also notice that the edges of the 45 deg. cut cloth do not un-ravel like the edged of the parallel cut cloth. Particularly with the parallel cut cloth, you will need to wet out the edges by patting rather than dragging the brush. This will help prevent the fibers from un-raveling.

A helpful exercise might be to stick a strip of masking tape on the work surface. Lay up and wet out the edge of the cloth about ¼ to ½ inch away from this tape. Then, practice dragging or moving the cloth edge to line up with the tape edge. Depending on the weave direction, you may find that dragging or pushing the cloth 90 degrees from the desired direction will stretch or compress it to move the edge in the intended direction. Understanding this property of the cloth weave can be very, very helpful when laminating to a fixed or difficult trim line such as the bottom of the windscreen.

You might also try cutting a strip on the 45 degrees bias, perhaps 6" long and 1" wide. Wet it out and then push and pull it to its extremes to see just how much it can stretch and compress. Learning this can make the difference between being able to have the weave pattern work for rather than against you. As I implied earlier, you have to "love" fiberglass into submission.

Practice and "wasted" material can make a big difference on an important lay-up like the RV-12 canopy.

RV-12 - The Ultimate Group Buy Gus Funnell

The RV-12 is a well thought out airplane design, but there's more to a good design than just flying qualities and easy assembly. There's also cost.

Occasionally, we'll see on the VAF site a group of builders banding together to negotiate a discount with a supplier of RV accessories. There's no doubt that a group buy is good for the consumer in the short run, but one sometimes wonders how it works for the supplier – does he scramble to ship 50 quick sales at a discounted price, only to see shipments drop because he just met three months worth of demand?

With the RV-12, the customer gets to take advantage of the "group buy" benefit without any of the normal effort or disadvantages to buyer and seller. Van's is doing what we have always done to keep control of kit costs for all builders, such as multiple applications for a single part. With the RV-12 we've extended this to the radios, flight instruments, and firewall-forward package. You may not be able to choose which radio, but you're sure getting the one we've chosen at the best price. Every component on the airplane is priced based on the best cost Van's can get, given multiple, repeated purchases. The RV-12 customer gets better prices on the engine, prop, radio, seats etc than could be negotiated by any one-off group buy.

As with most airplane-related issues, it's a compromise; in this case, choice vs. cost. We think that standardization favors the builder because it allows low prices obtained by relatively high volume purchases, and makes short building times possible. Getting everyone on board is important, because if customers decide to delete or substitute items, that means lower volume for the manufacturer and higher prices all around.

One of the predicaments of the aviation industry is its low volume by comparison with other consumer products. It's why no new engines can hope to emerge for a price similar to a car engine. Eclipse failed partially because their business model required sales of 500+ jets per year, which turned out to be unrealistic in the small jet market. Our business model does not depend on 500 RV-12 sales per year (though that would be great), but it certainly needs more than the handful of airplanes sold annually by most S-LSA manufacturers. One airplane per month or even less just isn't a viable business, unless it's at boutique prices.

By keeping the price as low as possible, we hope to encourage more people to get into or keep flying. Just maintaining the same number that we have now is a challenge, but one that must be met if private flying is not to end up in the same market as exotic, hand-built sports cars. There will always be some customers for a \$400,000 Lamborghini, just as there are some customers for a \$400,000 kit airplane, just not very many. Our intent is to keep flying affordable for as many as possible, so we are more interested in producing an airborne Miata than a Lamborghini. Without steady, high volume sales, the price must inevitably go up, which reduces the sales, which...you can see where that's going...

RV-12 PROGRESS



Tom Green recently went to Washington, DC, where he looked into a new bicycle, spent a couple days in the various galleries and buildings on the Mall and visited RV-12 builder Mitch Lock. He's still in the "research" phase of purchasing the bike (which, in Tom's case, can last for years) and he didn't bring us anything from the Smithsonian's gift shop. But he did bring back several photos of Mitch's project.

When Mitch is done, he and his RV-12 will serve as East Coast representatives for Van's.

CHALKIE DOES IT!

One of the oldest records still on record fell May 11, 2009 when South African Charles "Chalkie" Stobbs landed in Cape Town. Chalkie had flown his GP-4 from Cape Town to London, England and back in 3 days, 15 hours, 17 minutes. In case you're wondering, that's a great circle distance 12,427 statute miles or about 20,000 kilometers.

The original record was set in 1939 by Alex Henshaw (later, Sir Alex, 1912-2007). Flying a single-



like to see an RV equal Henshaw's flight (and we still might...British pilot Steve Noujaim is planning a similar flight in his RV-7) Chalkie choice of a GP-4 for this mission made sense.

Some on-line comments about Chalkie's flight downplayed his achievement, pointing out that Henshaw did not have the advantage of GPS or modern communications and did all his navigating with a compass and clock.

Chalkie is a man who's flown an RV-6 from Cape Town to Oshkosh. He's flown a Fairchild 24W from Cape Town to Oshkosh — contemplate *that*

seat Mew Gull, Henshaw completed the trip — in the opposite direction — in 4 days, 10 hours, 16 minutes. Some idea of the immensity of Henshaw's achievement is the fact that it took 70 years for anyone to break it.

Details of both flights are on the web at www.henshaw-challenge.com.

Chalkie, who's photo hangs on our entryway wall at Van's, is one of the long-time proponents of all things RV in South Africa. He's built an RV-6 and made the first flights on numerous other RVs. He's been a strong proponent of training and responsible flying and probably done as much (or more) to keep RV pilots out of trouble as any man in the country. Given his experience, he decided that an RV was not the airplane for this job. As much as we'd



for a moment. As far as we're concerned, he doesn't need to apologize to anyone. He made a well-planned and superbly executed flight across difficult terrain without damage to pilot or aircraft.

His effort is a significant accomplishment and reflects great credit on both himself and Henshaw.

On May 9, Van's and Synergy Air combined to show the RV-12 off to potential members of the "RV-12 Nation." Van's provided the airplane, **Wally and Neda Anderson** of Synergy Air supplied all the work, space and tools and arranged to use the well-named Friendly Air hangar on the Eugene, OR, airport.

About 35 people responded to our open invitation to come and see our new baby. About half of those took the opportunity to fly the 12, participate in building a rudder and swap the usual stories and lies over lunch.

Ken Scott reports he flew all day long, so he missed Dave Martin's presentation about the RV-12 group project Dave's masterminding in Independence, Oregon. (Dave's name may ring a bell — for many years he was the editor of *Kitplanes* magazine.)

Our thanks to Wally and Neda for the considerable effort it took to organize the event. We'd be open to other RV-12 Nation show and tell suggestions



FAA PAPERWORK

Before sending in any paperwork to the FAA for aircraft registration, please contact Cynthia (503-678-6545 ext. 301 or cynthias@vansaircraft.com) with the following information:

- Model of the kit.
- Liability waiver
- Serial number (builder number/customer number).
- Last name, first name and middle initial (if there is a partnership, please provide this information for all concerned parties. For a business, please list the name of the business as well as the business address).
- Physical address (street, city, state, country and zip code. No post office boxes, please).

Every week, the documents are completed on Thursday morning and mailed on Friday.

Kit Ownership Change

When a kit, flying or not, changes ownership, please send a copy of the bill of sale (fax: 503-678-6560, mail: 14401 Keil Rd NE, Aurora, OR 97002 or email: cynthias@vansaircraft.com), so the file can be changed into the name of the new owner. The bill of sale should include the signature of the former owner(s), serial number of the kit and the name/contact information of the new owner (i.e. address, email, telephone, fax).

For RV-12 owners, A bill of sale (form 8050-2) can be made available from Van's after the finish kit has been delivered. Subsequent paperwork necessary for E-LSA licensing will not be available until after the entire RV-12 Kit has been delivered to the customer.