



*Master RV builder Lyle Hefel painted his latest RV-8 in the colors of Bud Anderson's World War Mustang.*



## BIRTHDAYS AT VAN'S

We don't often play up employees' birthdays — heck, a lot of our employees won't even admit to birthdays — but we recently had a couple that we enjoyed.

### BIRTHDAY 6\*

Company president Tom Green has been on a health binge for the last couple of



years. In the process he's lost a lot of weight, improved his fitness dramatically and revised his diet, becoming Van's in-house Food Policeman. Of course, he wouldn't eat a normal cake, so we came up with a special one, just for him.

Sprouts, carrots, seeds, sticks, and twigs. Tasty!

### BIRTHDAY ONE

Haven't spoken to shipping supervisor Jessica Vollbrecht for a while? Now you know why...Viktor and Vanessa were born January 7, 2009 to Jessica and her husband, Van's draftsman Mike Vollbrecht.

The twins join elder brother Max, so I imagine Mike and Jessica are lobbying the design staff for a RV-10+.





I'd built three RVs before starting my RV-12. Being one of the first RV-12 builders is turning out to be quite different. Heretofore, I've only trod a path well beaten by those who've built before me.

Without being specifically designated by the factory as such, I suppose I'm a beta tester. That's 21<sup>st</sup> century parlance for "guinea pig."

Each RV I've built was an improvement in design, manufacturing techniques and documentation over the one that had gone before. The RV-12 continues the trend. Its parentage is obvious, but this is a different child. 'Highly refined' would be an apt description and almost an understatement.

Normally we build the empennage, wings, fuselage and finishing kits in that order, but in this case the wing was available first, so that's where I started. The wing kit was what I expected: Beautifully crafted and fully assembled spars, skins covered in the blue plastic with every hole punched and a myriad of familiar looking

parts and bags of hardware. Many of the brackets, plates, gussets, etc. are produced siamesed together, much like the molded plastic parts in model airplane kits. The plans show you where to separate them and how much material to grind away. Better than making them from raw stock.

This is my first time building from the new RV-10 style plans/manual format.

It is a far more rational approach than the separate plans and construction manual. During previous projects, I'd wallpaper my workshop with the drawings. It was easier than leafing through them on a plans table, but I spent a lot of time walking back and forth to the manual and each end of the wall. Having the step-by-step instructions with the exact process displayed in an exploded, isometric presentation with the dashed "this goes here" lines is truly a quantum leap forward. The 11"x17" size has print large enough for my aging eyes to read and is small enough to keep right on my work table. Very convenient.

It didn't take me long to learn a few lessons that made the assembly of the wings, and later the fuselage and empennage, an easy and un-frustrating process.

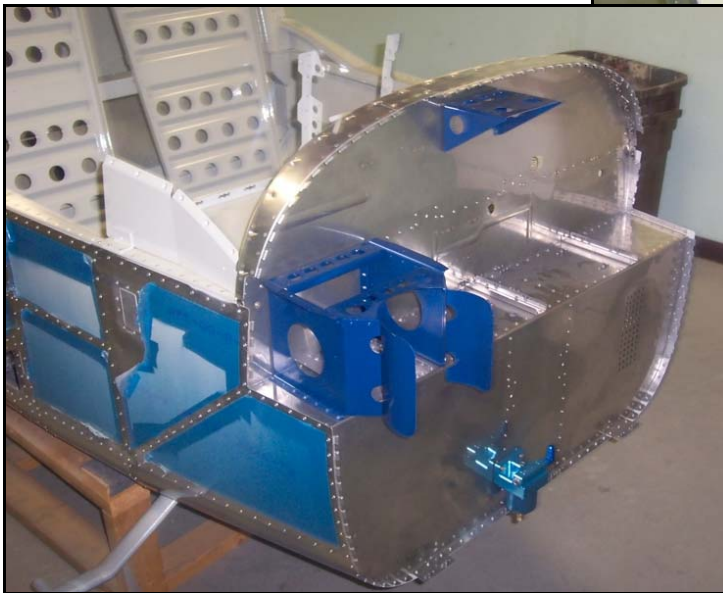


At the beginning of each section is a depiction of the completed assembly you are about to produce. Study it. Understand what it's supposed to look like.

Go thru the entire section step-by-step fully grasping how the assembly is intended to progress before the cleco pliers even come out of the tool chest.

Look for the "Notes" that speckle the plans. Attention to these can save wrong size rivets installed, rivets installed before they should be, and a few other builder concocted problems. Yes, I made some mistakes because I didn't do what I'm preachin' here.

The depictions of the parts show all the rivet



holes, bolt holes, nutplate attach holes, etc. at their exact location, size, number and orientation. Use this as a tool to cross check your understanding of the assembly. This is particularly important when you get to the box spar of the stabilator. This can save a huge amount of head scratchin'.

Once assembly begins, go step-by-step. Do not get ahead of yourself. You repeat offenders will have a tough time pulling in the reins -- I sure did. But do it. Don't do anything until instructed to do so.

I am continually amazed at how well the holes align. So I'm telling you, if it doesn't align easily, you are doing something wrong. Take it apart and start again.

The vast majority of the holes in the kit are punched to correct size so no final-size drilling or deburring is required. What a time saver. However, some other prep is required. For instance, all of the wing ribs will need to be fluted to straighten them. I straightened the ribs for both wings in about an hour. The edges of the ribs, bulkheads, braces, etc. have a sharp edge that is created by the punch press. I ran these over my

Scotchbrite wheel on the bench grinder. Takes a little time, but sure helps protect against any scratching as the skins are clecoed on. All the lightening holes were smoothed with either a Scotchbrite pad or a small wheel chucked in my hand drill. Plus, I "broke" the edges on all skins before they were clecoed on.

I spent a total of 65 hours building both wings and flaperons. Believe me, it's not that I'm fast -- it's the quality of the kit and adherence to the principles I set out above.

The fuselage proved a bit more challenging. There's a lot of parts, it's bigger and there are fuel and brake systems to be installed. When it comes to fabricating the fuel lines, the construction manual has a novel aid: Each section with a bend or offset has a full scale drawing of it showing the finished product. Checking my lines by laying them directly over the plans proved invaluable for accuracy. Only once did I have to remake a line, and that was because I cut the tube section an inch shorter than the plans instructed. Measure twice, cut once. Heard that before?

I suppose the upper and lower firewalls caused me the greatest amount of pondering. But I think it was the "experienced RV builder" thought processes getting in the way. Once I stopped questioning why that widget attached here and not over there my pace picked up. Refer to lesson 4 above.

Nutplates. You better love 'em. There are seemingly thousands that must be installed. The good news is that the attach holes are already in place. Most of the holes require dimpling or countersinking the structure, and in many cases you have to dimple the nutplates themselves. Once I realized that many of these little buggers needed dimpling, I set up my rivet



squeezer in my bench vise and dimpled fifty or so of each type of the #8 nutplates. It moves things along to have them already prepped when you need them.

Throughout the fuselage assembly, I kept wondering when would be the best time to paint the interior. If I waited until it was complete, parts like rudder pedals and brake lines would be in the way. So, I decided to delay riveting the complete firewall to the rest of the structure until the painting was done. Leaving the firewall out allowed me better access to the forward floor and sidewall area. My RV-12 is to be a factory demonstrator over here on the right coast, so, aside from a different exterior color, I wanted it to look exactly like Van's red N412RV. Looking at pictures of Van's airplane, I noticed that the rollover bar and its support are painted red, which shows through the rear window. Therefore I had to take the time to paint these components the deep blue I'd chosen before I could install the Lexan rear window. Believe me, I'm nobody's painter, but it turned out just a bit better than okay. I used up 120 hours on the fuselage, including the painting.

Onto the empennage/tailcone kit. Once more, follow the six lessons stated above, especially #4. I found the box spar assembly for the stabilator could be confusing. Pay particular attention to the machine countersinking of some holes.

It is crucial as these lay under the stabilator cable attach arms. The remainder of the stabilator and vertical stabilizer is straight forward. Pretty much just cleco and rivet with the exception of the vertical stab spar. Some match drilling is required, so take your time.

The antiservo tabs also take a bit of attention. They go together very well, but they have piano hinges to attach them to the stabilator. The punch press can't put rivet holes in hinges, so the builder must drill them to mate with those already in the tabs. They have to be drilled dead solid perfect. Soooo, a drill jig is part of the kit. It's a simple task of inserting its tangs between the

hinge eyes, and drill. Hint: Make sure you use a sharp drill bit. Otherwise, it will wander just a bit as you start to drill, enlarge the hole in the jig and cause an inaccurate hole placement. I figured that one out real quick. I guess that's why two of the jigs are supplied in the kit. Result, dead solid perfect.

The tailcone can be a bit unwieldy during the first stages of assembly. The many, varied and extremely light parts, even when clecoed together, can be a bit of a chore to manage. But once the bottom and side skins are clecoed on, it becomes very controllable. A second set of hands during this process would be very helpful, but not required. After the entire cone was riveted, I lifted it. It was astonishingly light. I figured its attachment to the fuselage would be a snap. In actuality, I found that it required

close attention to exactly how the skins of the fuselage overlap each other and the tangs of the cone. It is tight. But after a bit of mechanical and verbal persuasion, all those amazing little holes aligned perfectly. This was probably the most frustrating task of the entire project, mainly because I did it alone. Next time I'd enlist some help.

Well, I finally got to the scariest part of any RV project -- the fiberglass. A small, two-piece fairing finishes out the aft fuselage. The stabilator has to wrap around it and the trim actuator arm (an amazing little piece of mechanical geometry in itself) has to protrude through it. Read the instructions about four times before attempting this task. It takes a bit of finesse. Just make sure you have the stabilator attached when you align the cone and drill it to the fuselage. This way you can perfectly center the cone and give an even clearance around it. Total building time for the empennage kit was 60 hours.

If you've been adding along the way, it's taken me about 245 hours to complete the first three kits. I'd say that would be about average for most repeat RV builders. Newbies would take longer. Again, it's the combination of the plans/manual, quality of the kit, and the step-by-step process that keeps the build time low.

As far as my role as guinea pig, er, beta tester, I made my notes of the few discrepancies and shortages to relay back to engineering. But every time I'd call, Krueger would say, "Yeah, we know about that one already." There's some sharp builders out there who beat me to the punch. Good goin'. And keep it up. You're making my life easier.

Many years ago I built an RV-3 with no holes at all. Then I ordered an RV-6 and when I saw the pre-punched wing skins I giggled like a fool. When I received my matched-hole RV-7 kit, the giggling turned into a raucous laughter. The RV-12 kit... Builder's nirvana.



## RV-12 DEVELOPMENTS

KEN SCOTT

### KIT PROGRESS

Our red RV-12 has lived in the prototype shop for the last several weeks. The timing was deliberate – VFR flying time in an Oregon winter is always spotty, and the early months between New Years and Sun 'n Fun are always our slowest time of year.

Most of the shop time has gone into the Finish Kit. And, hurrah, it is finally ready. Near the end of February we sent letters to all current Fuselage Kit builders, inviting them to place orders for the Finishing Kit. The price of \$8450.00 seems high, compared to Finishing Kits for other RV models, at least until you realize what you are getting. RV-12 kits include upholstered seat cushions --the color selections are on the order form. (My favorite is "antelope/toast". Sounds like a Bear Grylls lunch – and no, I don't know how big a toaster an antelope requires. Then there's "olympia/scarlet", which would be a great name for an actress in the kinds of movies my parents wouldn't admit existed.) Also included are seat belts/harness, the canopy, landing gear components and a cowl that the builder can fit to the airplane without having the engine mounted.

### PROGRESS IN THE FIELD

Our early "beta-testers" Jim Cone (West Coast) and Mitch Lock (East Coast) have completed all the empennage, wing and fuselage kits – and they are not alone. Several other builders have caught up with them. We are giving current kit holders first crack at Finishing Kits, so we expect a number of projects to be moving forward again very shortly. It is (barely) possible that we could see a few customer-built RV-12s at AirVenture this year.

### PLANS REVISION SYSTEM

Because the RV-12 is intended to be eligible for the Light Sport Category, some sort of "accounting system" for plans changes is required. We've decided that our website will be the mechanism for putting necessary revisions into the hands of builders. If you don't have a computer or access to the internet, you will need to arrange one – a friend, the local library, or something similar. As a society, we've come to the point where internet access is just assumed, much like we assume most people have a telephone.

Here's how our system works:

CHANGE MEMOS note insignificant spelling/wording changes to drawings that will not affect the aircraft at all. Memos will NOT show a revision level change in the title block. Dates, however, will change.

CHANGE NOTICES may reflect changes in hard-

ware callouts, dimensional changes, additional instructions, etc. that affect construction. Change Notices WILL show a revision level change in the drawing title block as well as a date change.

SERVICE BULLETINS define required changes to the aircraft. Drawings, parts and methods will be defined and available to enable builders to comply. This may include both revisions to existing drawings and new drawings, as necessary.

So, as a builder, it's up to you to check our website frequently. Go to the opening page, click on Service Information/Revisions, scroll down to the bottom of the page and click on page 2.

If you find a drawing with a later date or a higher revision number than the one you have, and it shows a portion of construction that you have not reached, simply print out the new drawing and destroy the old one. There's no need to keep track of exactly what changed. (Don't have printer that can handle 11x17 paper? Your friends down at the all-night copy shop do, and they can open our web-based file right from the store. Or you might consider acquiring a printer that will handle the job. Consider it a tool, just like a rivet squeezer, that you need to accomplish the job.)

Suppose you find a drawing with a later date or higher revision number than the one you have, and it shows a portion of construction you have already accomplished. You may print out the drawing for your own amusement, but there is NO REQUIREMENT to re-do any step of construction to conform with a revision.

If we determine that there is some reason that an accomplished construction step must be re-done, we will issue a Service Bulletin detailing the required steps and/or parts.

### S-LSA CERTIFICATION

We are spending some time on final details of the Powerplant and Avionics kits, but a lot more time is go-



ing into the documentation necessary for S-LSA certification. This is not a simple, fast or easy process!

The FAA has allowed S-LSA manufacturers to essentially self-approve by submitting an affidavit stating that they have accomplished all of the flight test, manual, maintenance program, QA requirements, etc. The FAA accepts the affidavit as proof that the testing and documentation was complete, without any examination, inspection or testing on their part. That's a lot of freedom.

It is our intention to fulfill this responsibility as completely as possible. When Van's submits the package for S-LSA certification for the RV-12, we expect it will become the 'gold-standard' for S-LSA certification. Our engineering crew has been very thorough and complied with the letter and spirit of the rules. We expect no 'bumps' once our documentation is submitted.

### **BUILDER CERTIFICATION**

If a builder intends to license their RV-12 as an E-LSA, they will be required to supply a completed Form 8130-15 (Light Sport Aircraft Statement of Compliance) to the FAA at the time of licensing. The completed Form 8130-15 is supplied to the builder by the manufacturer (Van's Aircraft, Inc.) only after the builder has purchased all of the kits in their complete form. Van's

Aircraft is unable to issue the 8130-15 Statement of Compliance unless every component of the kit (including powerplant and propeller) has been purchased through Van's Aircraft.

In an effort to clarify the options builders have for certifying their RV-12, and some company policies that derive from the E-LSA licensing requirements, we recently added a cover letter to the on-line RV-12 order form. It's reprinted at the bottom of the page.

### **COMING ATTRACTIONS**

Several options are being developed for RV-12. These include:

- A lighting package, including interior and position lights, strobe and landing light.
- An autopilot installation.
- A dual EFIS package.
- A gearleg/wheel fairing kit.
- An interior panel kit in colors matching the seat cushions

We do not intend to market these optional kits until after the complete RV-12 kit is shipping. However, all of them are designed to be easily retro-fittable to finished RV-12s.

## **BEFORE YOU ORDER AN RV-12, PLEASE READ THIS!**

**Philosophy:** The RV-12 Kit was designed to be licensed as an Experimental Light Sport Aircraft (E-LSA). While it may be eligible for licensing in other categories (Experimental Amateur Built [E-AB], for instance) or under other rules in countries outside the jurisdiction of the FAA, we strongly emphasize that the RV-12 is the product of careful design and extensive testing. From the spinner to the rudder, it is a fully integrated system. We do not believe that it is in the best interests of any RV-12 builder to delete, substitute or modify any component in the kit.

Bottom line: Build it exactly as it is designed and supplied...we know you'll love it!

**Licensing Requirements: (E-LSA):** If a builder intends to license their RV-12 as an E-LSA, they will be required to supply a completed Form 8130-15 (Light Sport Aircraft Statement of Compliance) to the FAA at the time of licensing. The completed Form 8130-15 is supplied to the builder by the manufacturer (Van's Aircraft, Inc.) only after the builder has purchased all of the kits in their complete form. Van's Aircraft is unable to issue the 8130-15 Statement of Compliance unless every component of the kit (including powerplant and propeller) has been purchased through Van's Aircraft.

Bottom line: If you plan to license your RV-12 as an E-LSA, you cannot delete kit components!

**Credit for Deletions:** (deletions are not allowed on E-LSA kit purchases)

Each complete kit is designed, produced, sold, crated and shipped to optimize efficiency and the value of the kit. Kit component deletions result in reduced efficiency and increased costs. Subsequently, the credit allowed for deleted components is adjusted to reflect the discounted price of the component as part of the complete kit.

Bottom line: You will receive less than retail credit for deleted kit components (including engine and propeller).

### **Returns Policy for RV-12 components:**

As with kit component deletions, RV-12 builders who choose to return kit components will not receive a Form 8130-15 and will not be eligible to license their RV-12 as an E-LSA. Van's standard return policies will apply to RV-12 components. Standard restocking fees will apply.

A customer who deletes or returns components will be required to fill out, sign and return a "Non-Standard Kit" affidavit prior to shipment of their kit or receiving credit for a return.

# GEAR LEG MEANDERINGS

KEN SCOTT

About three years ago, I had my RV-6 apart, installing a new engine and prop. With the engine and cowl out of the way, I gave the engine mount a careful inspection. I could find no cracks or other problems, but there were trails of "smoke" around the bolts holding the landing gear legs – a sure sign of metallic metal-on-metal abrasion. A quick jack-and-check revealed that the gear legs could be slightly rotated in their sockets even with the bolts tight. Well, I guess you've got to expect some wear after a thousand landings (and almost as many approaches). I pulled the mount, complete with landing gear, off the airplane and reamed the holes in both the mount and the legs to take close-tolerance bolts. Getting the assembly on the mill for the reaming operation required removing the old wood gear leg stiffeners and fiberglass.

That wasn't too tough. They were brittle and broken and came off easily by hand. There were some resin clumps that required some tapping and chipping, but it didn't take long to get down to clean gear legs. (While I was at it, I investigated re-finishing the mount and legs. The powder coating was pretty battered by clamps, cable-ties, slipping wrenches, etc. To my delight, the powder-coat guys said no problem. No need to bead-blast it or anything, they could clean the parts and powder coat right over the old coat. And indeed, when the parts came back, they looked brand new.)

A gentle in-and-out with a drill-spun wire brush cleaned the overspray out of the bolt tubes and the mount went back on the firewall without a hitch. The new bolts held the gear legs with a reassuring solidity. The next big question was ***should I try to re-install wood stiffeners on the gear legs?*** It was pretty obvious that the trash I pulled off the legs hadn't been doing anything useful for a long time. None of the airplanes I fly at work have wood stiffeners. Putting the stiffeners on would require quite a few hours, most of spent with fiberglass—a material I've never learned to enjoy.

Given all that, I decided to fly the airplane without stiffeners, even though I live on a fairly rough grass strip – rough enough that I'll lose a screw per flight out of the wheel pants if I forget to use Locktite. If the ride was too rough or I encountered gear leg shimmy, I'd bite the bullet. In other words, I'd make the airplane prove that extra work was necessary.

Part of the sprucing up involved removing the rather battered aluminum gear leg fairings and putting new epoxy/fiberglass fairings on. This was a fairly simple operation, but I did find that using countersunk rivets in the thin fiberglass didn't leave much supporting the rivet head. Oh, well, if that didn't work, I'd figure out something that did.

Finally, everything forward of the firewall was new or

restored and it was time to fly. I couldn't tell any difference in the way the airplane taxied or behaved on the ground. This pleased me because now I could save the one or two pounds of the wood stiffeners and didn't have to do the work.

The leg fairings didn't fare so well. It wasn't long before the Mole Ranch took its toll and the heads of the rivets attaching the hinges to the trailing edge were pulling right through the thin fiberglass. I removed the fairings, drilled out the rivets and added a layer of very thin model airplane fiberglass to the inside of the fairing, where the hinge would rest. This only increased the thickness of the glass by a few thousandths, but it did provide backing so I could fill all the rivet holes. After the epoxy set, I re-drilled the hinges to the fairings, but this time I got a little smarter. I prosealed the hinge to the fairing, holding it place with clecoes, and let the sealant set for two days. Letting the sealant set *before* riveting is the trick – if you squeeze rivets too soon, it just pushes the sealant out and you get less bonding and a wavy hinge. I then countersunk the fiberglass and set the rivets. This arrangement has survived well so far.

While I was involved in refitting the fairings a neighbor happened by. "Hey," he said. "I've seen on the internet where some guys fill the fairing with that expanding foam insulation. It's supposed to damp the movement of the gear leg and support the fairing too. I've got some you can have."

No, no, no. I've seen what that stuff can do! Back in the early days, I watched another RV-6 builder peeling his gear leg fairings off. They'd been filled with that foam, and it had formed a very good moisture trap, holding water almost permanently against the steel gear leg. Corrosion had eaten right through his epoxy primer (pre powder-coat) and chewed an impressively deep pattern right into the steel. And in another case, I'd built a couple sets of wood ailerons for a modified Pitts. The spec called for a thin plywood leading edge, filled with foam. It seemed to work, but when the ailerons were finally painted a dark color and installed, the foam (months old at this point) started expanding again, probably because the absorbed sunlight raised the temperature enough to "re-activate" it. It exerted enough force to split and destroy the plywood leading edge, so I didn't want to see what would happen on a fiberglass fairing.

After a year of flying and taxiing on all kinds of surfaces, I'd had no problem with gear leg shimmy, wheel shimmy or fairing deterioration. I decided to let well enough alone and forgo the wood stiffeners. Next project: paint the gear leg fairings – three years is long enough. Paint. Yuck. Almost as bad as fiberglass...



## TAKING INVENTORY

We've covered this in the past, but with all the new builders (especially RV-12 builders) finding the True Way, maybe it's time to cover it again – especially because it's on my own mind.

The “empty shop syndrome” overwhelmed me recently. The KK-1 was built, flown, and on to a better home. The RV-6 was flying fine. The little single-seat Cub replica hanging from my hangar ceiling – well, I was far too tall to fit in it, so it's looking for a small person to take it off my hands and finish it. I really needed a project.

It boiled down to a choice between learning poodle grooming (don't ask) or building an airplane...so I wrote Van yet another check and took home yet another airplane kit. I spent a happy Saturday afternoon inventorying it. (I found exactly ONE wrong item. There were two left ribs when there should have been a left and a right. The hardware – hundreds of fussy little items -- was correct, down to the last nutplate and washer. I was impressed.) This, and some recent posts on VAF, brought the whole subject of “inventorying” to the fore.

With your kit comes a list of parts, bags and materials. Inventorying the formed metal parts is straightforward – they've all got part numbers on tags. Just check 'em off the list. The hardware bags are where the whining starts. Why so many bags? Why isn't all the hardware of one kind in one bag? Do I reeaalllly have to count all these little things? It's so booooooring.

Suck it up. It's difficult to explain exactly why the bags are arranged the way they are, even though there is a logic to it. Some of it has to do with the incremental kit format that makes RVs so affordable, some of it has to do with the various options (sliding or tip-up canopy?) that have different hardware requirements. Other reasons are lost in the fog of time. But to you, the builder, none of that matters. Bags are just a way to transport rivets, bolts and nuts from our shop to yours. They are not intended as containers for long term storage. When a builder receives a kit, his or her job is to get all the hardware out of the bags.

As you empty the bags, you should compare the



*Drawers. You need 'em. You need a lot of them. Go get them.*

contents to the bag contents list and note any shortages. That satisfies the inventory requirement, but that's just part of the job. The real objective of the exercise is to get the hardware into drawers/bins/containers *labeled by hardware type*. Got four different kinds of hardware in one bag? Yours not to reason why – just check each item off the list and put each in a separate drawer with a readable label. Got two bags with the same kind of hardware? Combine like hardware in the same drawer. No matter which bag the AN3-5A bolts came in, they should all end up in the same bin. Later on, when you get the next kit, most of the hardware will go into existing drawers.

Yes, this might take two or three hours. Yes, it might take 150 drawers by the time you have all the kits. But the plans call out the hardware by *type*, not bag number. If you get organized up front, you can avoid going to the bag list every time you need to find a bolt. That time would be better spent building productively, instead of scrabbling through deteriorating paper sacks.

Here's some “inventory tips.” If you sense the voice of experience behind them, you're right....

- The plastic cases with multiple drawers available from almost any hardware store or catalog are fine. A few larger drawers are handy. Be sure to buy the kind that has a tab on back of

the drawer that makes it difficult to pull the drawer all the way out.

- Drawers with dividers are fine, but put *dissimilar* items in drawer compartments. If 3–3.5 rivets spill into the 3-4 compartment you'll never notice, but if they spill into a 3-8 compartment, it's pretty obvious.
- Nail down your drawer boxes. When you pull one drawer too hard and yank the whole box-a-bolts off the shelf onto the floor, you'll see why.
- Use labels that won't get dry and fall off the first hot day.
- Even if there is only one washer of a given kind in the whole airplane, put it in a separate drawer with a label.
- Drawers are like clecoes – you can't have too many.
- Make a list noting where you put things that don't fit in the drawers and tape it to the wall. I can't tell you how many times builders have called about missing items (usually months or years after they received the kit) and later found what they were looking on the back of shelves or under benches, out of sight and forgotten.

#### **YOUR FRIEND AND MINE: MR. MAGNET.**

Recently I made a trip to the local lumber yard and next to the cash register was a table of cheap tools for a dollar each. Usually I shield my eyes from one-dollar tools, but I noticed several small magnetic pick-ups on telescoping sticks. What the heck...I'd just cashed my paycheck and was feeling flush, so I bought two.

These have turned out to be some of the handiest tools on my current project. They pull pop-rivet tails out of recesses of aluminum fuselages and lift them in bunches off the floor. Because I have recently learned exactly how painful a bad back can be and how long it takes to heal, I appreciate being able to pluck fallen clecoes out from under the bench without awkward body

bending.

I also use these tools for construction. There's a couple places, like the control column, where the plans call for inserting small washers into tight places while installing bolts. I've tried supergluing washers into place, but it's never worked that well for me. I found that putting a magnet on the head of the bolt attracts the washer well enough to keep it from falling to the bottom of the bottomless fuselage. At that point it can be prodded into place with a bit of non-magnetic aluminum. If washers do get away, the magnet will find them wherever they hide and bring them back.

Over the course of the project I've found several places where the magnet pulled bolts into place or held something where I needed it while I did something else. I've got an errand at the lumberyard tomorrow, and I might even buy a couple more.

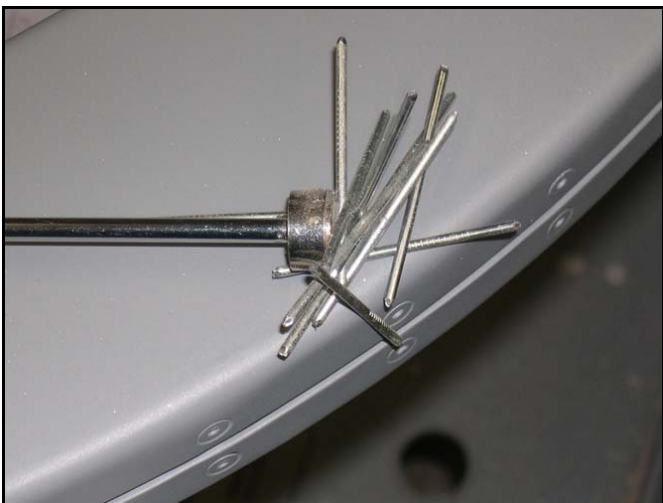
Thank you, Mr. Magnet.

#### **REDISCOVERING THE DRILL STOP**

I've had a couple of these kicking around in my tool box for twenty years. They came with a bag of "stuff" an older gentleman gave me when he heard that I was starting an airplane project. (He was also the guy who said "you'll need some dimple dies, too. I've got some tool steel here somewhere. You can use my lathe to make them." I'd never touched a metal lathe in my life and you imagine how well those dies turned out! I was quite relieved to find that I really didn't have to make all my own tools and could simply buy high quality dimple dies from Bob Avery...who also sells these drill stops.)

I finally got around to plugging these things onto a drill bit, just to see what they were all about. What a surprise! They noticeably reduce the time spent drilling large patterns of holes and completely eliminate scarring skins when the drill breaks through unexpectedly and then lets the drill chuck spin against metal.

They come in all the usual drill sizes and are color coded, just like clecoes. Love 'em!





# NEW PROPS

KEN SCOTT

Without much fanfare, we recently added several items to our Hartzell Propeller order form. These include a composite-blade 3-blade prop for the RV-10, with a required polished spinner, and two composite two-bladers for 180-200 hp two-seat models.



According to Hartzell “(the) advanced composite blades comprise a proprietary layup of carbon fiber and Kevlar® with co-molded electroformed nickel leading edges and an integral stainless steel shank. Hartzell’s 2-bladed ASC-II propeller is 16 pounds lighter than its 2-bladed aluminum counterpart. The 3-blade composite propeller for the RV-10 adds a blade over the Hartzell 2-blade blended airfoil prop with only a 10 pound weight penalty.”

We have not had a chance to flight test any of these propellers on our company airplanes, although we did have an opportunity to fly our RV-10 alongside a similar local airplane with the 3-blade composite prop installed. The preliminary results showed that N410RV, equipped with a Hartzell 80” blended airfoil aluminum 2-blade prop, had a seven knot advantage in top speed. Diameters for both two and three-blade props are the same, so there’s no ground clearance advantage one way or another.

A few weeks later, I got a chance to fly that 3-blade RV-10. We didn’t do any performance testing, but I was able to get some general impressions. First impression: it’s very, very smooth. Especially at idle, where it was plain spooky. There was no vibration at all — take away the exhaust noise and instrument readings and I wouldn’t have known the engine was running. At takeoff and cruise power the smoothness continued, making the airplane one of the most comfortable I’ve ever flown. It’s hard to quantify noise without a dB meter, but in this case the engine was no nois-

ier than the 2-blade installation and might have been quieter. Certainly the noise was different, and not at all objectionable.

Initial acceleration was very good, and the airplane broke ground just about where I’d expect the two-blade version to fly. Cruise was completely normal. I was interested to see how those huge wide blades would decelerate the airplane when power was pulled, but I can’t remember it being that much different from the 2-blade. Surprising.

Hartzell uses the same blades on the newer turbo-charged Cirrus, which is actually certified for known icing. The prop’s owner recently received his instrument rating in his RV-10, and during training he says he encountered some ice and a lot of rain with no ill effects to the blade leading edges. Unfortunately, this technological coolness and operational smoothness comes at a steep price. The prop weighs ten pounds more, but at least your wallet will be lighter!



## NEW PROPS AND PRICES

C3YR-1N/N7605 80” diameter, composite 3-blade design. Use with (I)O-540. For RV-10. **\$15,220.00**

D-4582-P Polished spinner -- required with composite 3-blade prop. **\$1,100.00**

C2YR-1N/N7605-2. 74” dia. composite 2-blade. Use with (I)O-360 180/200 hp. **\$10,920.00**

Use for RV-6A, RV-7A, RV-8/8A.

C2YR-1N/N7605-4. 72” dia. composite 2-blade. Use with (I)O-360 180/200 hp. **\$10,920.00.**

Use for RV-4, RV-6/6A, RV-7/7A, RV-8/8A.

# CALMING THE "BEAR"

AN EXERCISE IN DAMAGE CONTROL

VAN

On Jan. 27-29, 2009, the Amateur Built Aircraft Rule Making Committee (ARC) met in the Washington D.C. FAA offices for an extra session. I had been a member of the committee since it was founded and had attended several meetings over the last two years. The ARC had been disbanded after the last scheduled meeting back in early 2008. Many of the members figured our contributions were over and we'd just have to sit back and await the results.

But, because of the number and nature of the comments received from the public, this additional meeting was arranged to give the user and industry members another chance to affect the final rule interpretation and implementation.

## A Quick Review:

This whole ARC process was initiated about three years ago when the then-FAA Administrator became concerned over obvious abuses of the "51% Rule"

The Experimental Amateur Built category was created between 1947-1952. Because this category exempted EAB aircraft from the requirement to comply with certification and manufacturing standards, the FAA (then CAA) applied the "non-commercial" limitation. Because EAB aircraft are not required to meet any standards, "safety" has never been a formal issue, though it is an FAA concern. Thus the argument that "Professionally built" EAB licensed aircraft are safer, whether or not it is true for any individual airplane, cannot be used as leverage.

Over the years the EAA homebuilders have been able to improve their lot by convincing the FAA that "stage" inspections during building were not needed, that EAB builders could do their own condition inspections (annuals), and other operating improvements. In general, homebuilders had proven themselves capable of following the rules and building airworthy planes.

While the FAA had convened the ARC to correct their major concern over commercially built EAB aircraft, EAA and Industry had serious concern that the "corrective" actions of the FAA could very well adversely impact all homebuilders.

## ARC Achievements

I am satisfied with the results of this ARC process. Some of the issues proved quite contentious, but even-



*A calm bear is always better than a provoked bear...*

tually agreement was reached on several points:

1. **DISCLOSURE:** The ARC team created new language for disclosure documents used when applying for EAB inspection and licensing. These documents now make the applicant more aware of the serious nature of fraudulent statements regarding who actually constructed the aircraft and why.

2. **MAJOR PORTION COMPLIANCE CHECKLIST:** The FAA wanted to revise the 51% checklist, rarely used in the past, to help curtail commercial assistance abuses. The resulting new Kit Compliance (51%) checklist is longer, with more tasks listed, but in our opinion, it is actually more favorable to the interests of the kit manufacturers and amateur builders than before. A column has been added for recording areas of commercial assistance if it is used.

3. **THE 20-20-11 FABRICATION/ASSEMBLY PROPOSAL:** The FAA had wanted to require that of the 51% Fabrication and Assembly required of the EAB builder, a minimum 20% be fabrication. They did not want an EAB fabricated from a kit be a simple assembly process. A definition of FABRICATION was crafted and agreed upon by both sides, the 20-20-11 language was discarded.

4. **GRANDFATHERING:** Policies were created for licensing EAB aircraft built from kits and plans bought prior to the implementation of the new procedures. This will obviously affect thousands of EAB projects now under construction. Generally, these aircraft will



need a "checklist" at inspection time. The checklist will be available from the FAA website and/or from the kit supplier. When considering this, we envisioned many possible variations, and feel that "in process" EAB projects will be accommodated well under new policy.

5. **DETAILS:** The specific language of the entire EAB rule has been reviewed and hundreds of seemingly minor changes have been made. This process took much of the meeting time, and was tedious but necessary. The seemingly minor changes in wording could have major consequences to individual amateur builders. It was a necessary process, and because of industry involvement, the final form will be more favorable for the homebuilder.

### **SUMMARY:**

Overall, mainstream amateur builders, whether building from a kit or plans, will not have their long treasured freedoms withdrawn. However, requirements which had not generally been enforced before now will be. These will include additional disclosures on the certification application forms regarding any commer-

cial assistance used and non-commercial amateur builders who participated in the construction. Also, there will be a requirement for filling out the "checklist" and presenting it to the inspector (usually a DAR). None of these requirements should be of concern unless the applicant had used an excessive amount of commercial assistance in the construction of his aircraft. (That is the core of the whole "51% Rule" review, and is, appropriately, the only area likely to be affected by new policy).

It might be said, and I'm sure you will hear it said, that the entire ARC process was unnecessary; that the FAA wasn't going to do anything to hurt us anyway and that there was no reason for all of the meetings and letter writing.

Maybe, but from my vantage point, we would definitely have lost ground had we (industry/public) not been included in the policy making process and had you not written all of those letters. Remember, the FAA did not create the ARC with the intent of providing more slack. Yes, it was a lot of work to essentially maintain the status quo.

### **RV-6/6A PROMOTION**

So, all you RV-6/6A fence-sitters out there, the excuses just ended. Van's Aircraft, Inc. is about to make you an offer you can't refuse.

On March 1<sup>st</sup>, we lowered the price of RV-6 and RV-6A Fuselage kits to the low, low give-away price of \$3550 and \$4250 respectively. That's a savings of \$1000.00 -- a cool grand. These kits will include many improvements adapted from RV-7/9 kits, as well.

If it's a QuickBuild Fuselage Kit you need, we can do that, too. However, RV-6/6A QB Fuselage Kits require the original F-604 main spar carry-through bulkhead (shipped to the builder with the wing kit), so these components must be returned to Van's. RV-6 QB kits will sell for \$8860 and RV-6A QB kits will be \$9,560.

This is a limited time opportunity. Fuselage orders with a 25% deposit must be received before 8:00 a.m. Monday, May 4. Center sections for QB Fuselage Kit orders must arrive at Van's before May 15.

Delivery times should average around eight weeks for Standard Kits and 4-6 months for QB kits.

So much for the carrot. Here's the stick. After May 4, RV-6/6A Fuselage Kits will revert to pre-sale 2009 prices. They will be produced only on a "Batch Production" basis. In other words, to produce kits efficiently and economically we will have to wait until we receive enough orders to make a "batch". This will make inevitably delivery times longer and more uncertain.

The RV-6/6A is, to this day, probably the most successful kit aircraft in history. They continue to delight those who own and fly them. Isn't it about time you got yours going?

Questions? Give us a call. But do it soon. We're about to run out of ginsu knives



*The RV-6 is still the most popular kit built airplane in history. Why not finish yours?*

# **RV-12: A TOOL FOR GROWING AVIATION**

VAN

In the last couple of issues of the *RVator*, I wrote about how the unique design and features of the RV-12 not only make it a great little airplane for current GA pilots, but should also enable it to find acceptance among those seeking to become involved in GA.

Last Saturday, after an enjoyable RV-12 building session, I accompanied my "Social Director" to a theatrical event, the musical *Wicked*. (See, I do have a life outside of aviation.) One particular line in the dialog and songs stayed with me: "Everyone deserves a chance to fly". While I don't envision flying on a witch's broom as per the theme of the play, I couldn't help but question: Am I doing enough---are we doing enough----to make this happen?

Following are some thoughts about how the RV-12 might be used as a means of getting people, young or older, involved in aviation.



*Is this the first customer RV-12 to fly? Van took his RV-12 Finish Kit home in his RV-10...*

## **WHY SHOULD KIDS HAVE ALL THE FUN?**

In the last newsletter, I covered the idea of youth groups, school or otherwise, building and flying RV-12s. This is a segment of our population that needs to be energized if GA is to grow, or even survive.

(In fact, I'm involved in an embryonic RV-12 building project involving a local organization called Airway Science for Kids or ASK. We have held a couple planning meetings, and are on track to get started in a couple of months. We hope to use this as a model project for developing a curriculum for other such projects around the state and country. Ideally, we will also create a blog so that all can follow our progress...but I digress...)

However, people in almost all age brackets need to be made aware of the opportunities offered by aircraft such as the RV-12. Opportunities are there for non-current or under-active pilots, as well as for many adults who have long harbored interests in flying, but have never found the opportunity or encouragement to become involved.

## **WHY SHOULD MY CUSTOMERS HAVE ALL OF THE FUN?**

I conceived this mantra when I decided to build my personal RV-12. My initial motivation was just wanting a shop project which would be less demanding than addressing the knotty details of finishing my RV-11 motorglider -- something I could escape to when irksome

little details bogged me down. Also, brother Jerry, who lives just miles away and who had helped me build and fly my RV-10, needed something to do during rainy winter days.

I picked up the Emp/Tail Cone kit on Dec. 12<sup>th</sup>. Progress has not been stellar because I seem to lack the patience to read and follow the very specific building instructions---I tend to only look at the illustrations and dive in head-first. With the RV-12, to an even greater degree than the RV-10, it is essential to follow the step-by-step instructions. So, I have spent extra time backtracking and doing things over. The holidays and two or three week vacations for each of us also provide convenient excuses for our slow progress.

As of March 10<sup>th</sup>, the Empennage, Tailcone, Wings & Flaperons were finished, and we were joining the tailcone to the forward fuselage. The rudder pedals are in place, as are all of the brake lines and fuel lines and fuel system components. I have just taken delivery of the Finishing Kit which includes everything else short of the engine and instruments/avionics. I am in the process of running wiring harnesses, and am eager to get back to some of the more structural stuff like the canopy installation. At least we have a few weeks more work before we join the chorus of RV-12 builders pounding on the door clamoring for their next kit delivery. (The only downside to the rapid construction is the need to write big checks in rapid succession! Slow building incremental kits spreads the cost out over a long period of time---sort of like installment payments without paying loan interest. When building is really



fast, you must have a substantial bank account, take out a loan, or find some other means of spreading out the cost.)

Confession time: In addition to brother Jerry, the past several Saturdays have seen three additional builders in my workshop. These include my younger brother Stan, Jim Mitchell, and Louise Lane. Stan is an experienced builder, going back to work he did on my RV-1 wings while a student A&P. Jim is building an RV-8 and had been a volunteer on the restoration of the Little Gee Bee historic homebuilt now on display at the Smithsonian's Udvar-Hazy center in Washington, D.C.

Louise had also helped on that restoration. Both Jim and Louise are planning to volunteer as shop instructors for the **ASK RV-12** building project, and working on my RV-12 is helping them gain experience toward that end. So, I certainly can't claim complete credit for the rapid progress being made.

### **IT'S JUST PLAIN FUN!**

Why do these folks keep showing up at my shop? Simply because they enjoy building this airplane. That is the really amazing part of working on RV-12 construction. It is almost impossible to put in a shop session without some tangible progress. You can always see something that lets you feel that you have accomplished something significant. The light at the end of the tunnel grows brighter. As builders, you know the importance of this feeling.

Aircraft homebuilding is usually a solitary pursuit, and this is fine -- just set your own pace and enjoy the process. However, there is no reason that building can't be a social affair as well. We found this to be true during the Little GeeBee restoration and are finding this again with the RV-12 project. So, the thought comes to mind: Why don't more people do group building?

### **A POSSIBLE SCENARIO:**

Get a group of 4-5 persons to buy and build an RV-12 kit. Ideally, one or more of the group would be a pilot and prior builder of an RV or other metal airplane. Such a resident Guru could instruct newbies on the basics of A/C construction practices, thus avoiding errors and saving time and frustration. Sharing the cost would make the short-term build affordable and the elapsed time to build should not need to exceed 3-6 months.



*Few things are more fun than working on an interesting project with good friends. The tailcone and fuselage have just been joined by Jim Mitchell (just visible over the tailcone) Louise Lane and Stan VanGrunsven (far side of cockpit) and Jerry VanGrunsven (back to camera.)*

Once finished and test flown, the non-pilot partners could take flying lessons and become pilots. Insurance and "storage" (need not be "Hangar") costs could be shared and kept to a minimum. People who "have always wanted to fly," but "just never quite got-around-to-it" would have the opportunity and the encouragement to finally do it.

There could be variations to this theme. For instance, the pilot/building coach may not need to be an owner, but might negotiate flying privileges in return for his shop instructor services.

As a 20% owners of the airplane, you might expect it to be available 50% of the time you want to fly it. Sounds like a good trade off!

As a 20% owner/builder you get in the air in months rather than years. The plane isn't available 100% of the time you want it? So what? If you had been building on your own it would cost you (individually) 5 times as much, and it wouldn't have been available at all for a year or maybe two. Better to fly part time than not at all!

The above scenario may not apply to most of you who already have an airplane. However, it could apply to tens of thousands of non-pilots; those people who are desperately needed if GA is to grow — some might say survive.

While flying clubs and shared ownership are not new concepts to GA, maybe a new approach to the concept could draw in a new wave of pilots. In larger cities, or neighboring towns, multiple build projects could be on-going at any given time, thus broadening the social appeal and public awareness/appeal.

*Percival Mew Gull AEXF is still flyable today.*



In 1939, 26-year-old Englishman **Alex Henshaw** strapped himself into his Percival Mew Gull G-AEXF, started the 200 hp Gypsy Six engine, and took off from Gravesend, near London, bound for Cape Town, South Africa. Thirty-nine hours and twenty-three minutes later, he landed, having traversed Europe, the Mediterranean and the length of the African continent.

He promptly began the return flight, which, re-

## CAPE TOWN RACES KEN SCOTT

*Chalkie's mount: a GP-4*



markably, took just eleven minutes longer. During the course of the flight, he flew almost seven hour legs, fought thunderstorms, malaria and tropical heat. Imagine the challenges, flying the length of the aptly named Dark Continent, over (literally) uncharted territory, at night, alone, without a radio, artificial horizon, or turn/bank indicator — and no navigation aids whatsoever. During the flight, Henshaw made ten take-offs, all at precarious CG positions and weights. Four of these were at night, in an airplane with virtually no forward visibility on the ground. Upon landing at Gravesend, a battered, sick and exhausted Henshaw had to be lifted from the tiny cockpit. He had accomplished his mission and set an incredible record for the journey, covering 12,750 miles in 78 hours, 34 minutes, averaging about 209 mph. Even harder to believe: The entire trip, including turn-around time in Cape Town, was made in 103 hours! It was a remarkable flight made by a remarkable man.

*Steve Noujaim's RV-7*



Today, seventy years later, the record still stands. Nobody in a 1000 Kg airplane has ever come close. But now, two

people in the RV world are making plans to challenge it.

**Chalkie Stobbart**, a training captain with South African Airways, has been a stalwart in the South African RV world. He's coached and trained numerous RV pilots, and made first flights on at least twenty RVs. Many RVers will recognize Chalkie's name: He's the pilot who flew his RV-6 ZU-EAA from Cape Town to Oshkosh and back in 2003. (What they might not know is that he'd made the Cape Town—Oshkosh trip before...in a Warner powered Fairchild 24!) Chalkie plans to fly the trip in reverse, starting in South Africa. His aircraft of choice is not an RV, but rather a GP-4, an all-wood retractable powered by an AeroSport Power IO-375. The retractable GP-4 is faster than most RVs, cruising at some 230 mph. While Chalkie's credentials as an RV enthusiast are unquestioned, the GP-4 might well be a better choice for the mission. (Jon Johanson looked into Henshaw's record but decided he didn't stand a chance of breaking it with his RV-4).

**Steve Noujaim**, of Chichester, UK, is taking a slightly different approach. Steve, a vastly experienced pilot, built a very clean RV-7 and plans to use it in his own record attempt. He realizes that the different airplane requires a different plan.

"In 1939 Alex stopped off at Oran in Algeria, Gao in Mali, Libreville in Gabon, and Mossamedes in Namibia each way but I am hoping to do just two stops in each direction in Algeria and the Congo," Noujaim says. "The only way I can beat him is by going further and having fewer stops so this means that sometimes I will be flying 11 hours at a time. I won't be eating a lot for obvious reasons. I will have astronaut food high in sugar to keep me alert. As a current long-haul pilot I know all about sleep deprivation."

It will be fun to follow both of these exciting flights. As both pilots concerned would no doubt point out, nothing they do could ever dim Henshaw's achievement. But they can add their own beam of light to it.