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# EEA Chapter 32 News

The official publication of Experimental Aircraft Association Chapter 32 - St. Louis, MO (Jim Bower, Editor)

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**May, 2020**

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# May Meeting is Canceled

## Newsletter Contributions and Deadlines

Anyone wishing to submit articles, advertisements, rants, etc. to the newsletter should send them to your friendly editor on or before the Saturday before the scheduled meeting. Send contributions to [newsletter@ea32.org](mailto:newsletter@ea32.org).



# President's Corner

by Bill Doherty

Well I'm enjoying my latest copy of Sport Aviation with some of the neat

things I was going to see at Airventure this year. Jack Pelton states in his Open Cockpit remarks that by the time we read it the world will have changed. It sure has! By now I'm sure we all know Airventure Oshkosh is canceled for 2020 due to the Corona Virus.

That had to be a tough call to make but an obvious one given the situation. I fully agree with and support this decision. Still, it's a big hit to our organization and certainly to the economy of Wisconsin. Millions and millions of dollars will not be spent in the region for everything imaginable that supports our weeklong gathering of hundreds of thousands of people. For EAA the convention also represents the lion share of the organization's annual fundraising to pay for its operations. This is in addition to losing all the interaction with fellow members and the disruption of the very business of EAA. It also affects the many sponsors and vendors of the event who often rely on orders generated there for the survival of their business. It's a devastating blow but we're inherently a resilient and innovative group, us EAAers. We'll make it through this. Don't be surprised to learn of some interesting solutions to how we may be able to interact with the vendors and exhibitors in the coming months. I'm quite sure they're working on something to accomplish that. Many, including myself have suggested finding a way to do that on the EAA Facebook page and have received positive feedback.

So where does this leave us, Chapter 32 in mid-May of 2020? **I still think we need to hold off at least one more month on having our meetings and any group activities AT THE ARC.** Having said that we do need to look to how we restart things for the chapter. Looking at June I think we can tentatively expect to meet again at the ARC with considerations for social distancing and maintaining as clean and sanitary an environment as we can.

That doesn't mean we can't still meet in May, just in a different way. It's important for us to continue to keep everyone engaged as much as possible. Charlie Becker notes in this month's chapter video (made prior to the cancellation announcement) we are an Experimental group!

EAA is encouraging chapters to try having virtual meetings in May. Okay, I'm game. I've never organized anything like this before and I'm not the most technically savvy guy, so my learning curve is darn near vertical as I'm writing this. Charlie pointed to some resources on EAA's website and having examined the recommended services it looks like GoToMeeting is promising and easy to use. I like easy. It's the service EAA uses and we can have up to 150 participants in a meeting. There's a free trial period available so maybe we can try it and see how it goes.

There is a reality that some will still feel uncomfortable going out and being in a group due to potential health risks. Having a virtual connection for meetings can allow them to participate too either on their PC, tablet, or even a smart phone.

Obviously, I'll have to discuss this with our other chapter officers and board members and form a plan forward. From what I've used at work these are simple to use as a participant. I'm about to find out how it goes as an organizer! In my experience an email or text message gets sent out with the meeting time and sign on information, you follow those instructions and you're in the meeting. We use a service at work on our phones that sends a notice our weekly supervisor meeting is starting. We select the join button and we're on the call and can turn the camera on or off as well as mute our phone, so background noise doesn't disrupt everyone else.

If we're able to attempt this with success, it'll be a new and handy tool to have as a chapter. We'd still be able to meet and share information if say the river floods again or Godzilla attacks Smartt Field or flaming locusts come. So, keep an eye on your email in the coming weeks. We'll send updates and/or instructions about this and how to join in.

On another subject, since we won't be going to Airventure, I had a couple ideas...

Each year in the past we've tried to get as many Chapter 32 members as we could of those attending to meet for a group photo, usually someplace like the Brown Arch. This year we can have a July meeting which would have been during Airventure and if everyone wears their Chapter/Airventure 2020 apparel, we could have a group photo on the flight line in front of the ARC, socially distancing of course. I know we have some talented artists in the

chapter. Could we maybe have a Chapter 32/Gateway Arch in the photo? We'd then send it to EAA to keep our tradition alive, albeit from a distance.

Personally, I'm going to make a donation to EAA. I'll estimate about how much I would have spent on admission and camping for the amount. I'm also going to get online and purchase some Airventure 2020 items, probably to wear in the July photo. If you don't know, there's already a rush on a lot of items in the EAA online store! People immediately started asking about it on EAA's Facebook page. I've included a link.

Try to stay engaged as much as possible with our love of aviation. Share what you've been working on with the group whenever you can. Invite new people to our June and July meetings. I just recently met a young pilot at work who flies Cessna CJ-3s. He's in his twenties, I guess. During conversation, it came up he's interested in EAA and airplane building workshops. I immediately invited him to join Chapter 32 and asked what plane he was thinking of building. He replied a Pietenpol!!! Yay! He even told me he'd purchased a Ford Model A engine! Old school still lives!!!

I'm going to wrap up with some links to some of the vast information available online at EAA.org. Sign in as a member and you can register for any of the upcoming webinars or view some from their extensive library. I've included links to this plus the monthly chapter video with Charlie Becker. He discusses some interesting changes coming to the chapter videos and talks about trying out a chapter virtual meeting. I also included the link to the online EAA Product Catalog so you can get some cool Airventure Oshkosh 2020 swag! Until we can meet again online or in person, stay vigilant and fly safe!

**C.A.V.U!!!**  
**Bill Doherty,**  
**Interim President**  
**EAA Spirit of St. Louis Chapter 32**

**EDITOR'S NOTE: You can trust these links...I've tried them.**

[May 2020 Chapter Video Magazine - News from HQ](#)

[Webinars](#)

[EAA Product Catalog](#)

## A2Z Aircraft

Do you need something from Aircraft Spruce? Would you like to support EAA32 and save some money at the same time? Of course you would!

Just go to <https://a2zaircraft.com/> to place your order for anything that Aircraft Spruce sells. You will get a discount and EAA32 will get a donation.

# RV-9 N938AG

**Dan Garrelts**

I was recently asked to provide a write-up of my build of a Van's RV-9 to share with EAA Chapter 32. Given most of my time at Smartt has been centered around the build and Phase 1 flying I haven't strayed out to meet many of you, so I also wanted to share some things about myself as well throughout this write-up in order to help with future conversations.

I grew up in central Illinois just south of Champaign/Urbana in the small town of Philo IL. Aviation had a strong hold in my family with both my Dad (Weldon Garrelts) and my Uncle (John Garrelts) providing plenty of opportunities to talk and experience airplanes and flying during my childhood. My Uncle lived just 45 miles away and had a private grass strip on his farm. During World War II he flew L-4 Grasshoppers in Europe for Patton and always had great stories of that time to share. My Dad held jobs with the University Of Illinois teaching in the A&P program, and ran the Maintenance shop on their fleet of training aircraft. He also got hooked up in Aircraft Accident Investigation, which provided plenty of practical learning opportunities. He also has his IA and came by often during the build to inspect the project, provide an extra set of eyes, as well as motivation to keep things moving forward.

While I was in grade school, my Uncle and Dad had a PA-12 that was kept on the farm and I remember all the rides I was always able to get but also remember the annuals, maintenance and one time recovering that airplane. Although I wasn't any help at that age, growing up around that plane and the others that would land at the strip made aviation part of life. They traded the PA-12 off and my Dad then had his eyes set on a PA-22 Tri-Pacer. At that time I was just starting High School so my involvement was more hands on with this blue and white airplane that some of you may have seen visit Smartt Field up until 2018. After the first year it was decided we would replace the covering with Ceconite 101 fabric, convert it to a Pacer, and give it some more horsepower. With the airplane in our garage I was able to get a lot of hands on work in the recovery process. We had a good friend do all the welding for the conversion while my Dad, Mother, Brother and I did all the rest. We all spent a long time sanding tubes to remove the old paint and primer, but the fun was getting the metal primed and putting it back together. I learned a lot about fabric covering during this time that unfortunately I have not used since.



**(My Dads (Weldon Garrelts) Piper Pacer  
PA-22/20-180 after getting gas)**

When I started college, I went ahead and got my A&P and I worked at the University of Illinois as an Aircraft Mechanic. Making less than the auto mechanics that worked on the main Campus, I looked and found a job at McDonnell Douglas after getting my Business Degree from Illinois. I never met the requirements to get an IA and this weighed into my future decisions for owning my own airplane and being able to control maintenance costs. I started looking at homebuilts. At that time the most popular designs that had caught my eye were the Rutan planes, Kitfox, Avid, Stoddard-Hamilton (GlaStar) and Vans RV series. I knew little about working with fiberglass, but having worked with fabric the Kitfox and Avid planes appealed to me. I had also worked limited sheet metal as a Mechanic at the University Of Illinois. I went back and forth in my mind and slimmed the list down between the GlaStar, and RV-7 & 9 airplanes. My lack of knowledge of fiberglass and the sheer numbers of flying RVs finally got me heading towards the RV planes. A trip to the factory in Oregon where I was able to talk them into getting a flight in both the RV-9A and RV-9 helped me make my final decision. I remember the sales team talking up the 9A but after my time flying the PA-22/20-180 Pacer, I found the RV-9 very tame by comparison. I signed on the line and the tail-kit was ordered before I left the factory.

Often the kits are categorized between the normal kit or slow-build and the quick-build. Slow-build is a relative term but in my case it spanned a total of 16½ years. Not the longest on record but certainly above the average range. I always explain to everyone who asks that the balance between Time, Money and Family didn't always line up with building my airplane. My wife Connie and I are blessed with four children (from oldest to youngest, Michael, Rachael, Sarah, & John) and there was time spent at baseball, soccer & dance along with the times



building in the garage. Connie always helped remind me of the importance of life balance and kept me in line on being there for the important things. Along the way, my mother (Alice Garrelts) got diagnosed and later lost her battle with lung cancer. All the time I spent away from the project I would never change for the world, but it certainly kept me from finishing at any sort of quick pace.

When Time, Money and Family lined up, I really enjoyed all the learning that went along with the project. The RV-9 plans and instructions provided by Van's were very well laid out for the structural build and changed to more guidance format for the electrical/engine installations. My riveting skills were moderate when I started, but I had full contact with the mechanics at McDonnell Douglas so I received a lot of first hand training from the experts. Sheet metal is one of those skills that is both Science and Art. There are tons of reference data/tables/publications on subject which if followed provides you the opportunity to produce defect free assemblies. HOWEVER, the secrets of those who work with it daily are priceless and from my experience, give you the chance to be produce assemblies you have no problem showing others.



**(Horizontal Stabs and Elevators  
assembled for the 1<sup>st</sup> time)**

I had the tail pretty much complete within a year and that included the fiberglass tips along with final paint. I learned a lot about documentation during this portion of the build. One of the habits I started at this time was documenting mistakes, and it provides a great resource now that I am performing all the maintenance. Any deep scratches in metal, mis-drilled holes, or short edge distance of holes, were emailed to Vans Aircraft with their response added to my build Instructions. Most were accepted as is or required only minor touch up. However there were others that required doublers or part replacement. It's reassuring now that I'm working on the plane, when I see something that doesn't match the blueprint, I can go to my records and see where a Van's engineer provided the recommended repair.



**(Right Hand Longeron bending. Notice  
the deadblow mallet on the workbench)**

One of those non-minor items that I will share with you still hangs in my garage to remind me of trying times and the ability to move forward. The upper longerons of the RV-9 are a piece of .125" thick 90 Degree extrusion with two 3/4 " legs. They required hand forming to bow around the passengers in the cockpit. After you go forward of the wing spar carry through attachment, the longeron makes a comparatively sharper bend down that also twists to tie into the forward bulkhead and engine mount. As you attempt to bend the extrusion in the direction you want, you also have to compensate for the other leg of the 90-degree angle as it will impact and move the part in an unintended direction. It was at this bend I was having trouble getting the longeron to match the Blueprint contour. It was on my final attempt to get the contour correct, that the wooden blocks holding the longeron in the vise slipped. This allowed the steel vise jaws make contact with the inside of the bend. The actual indentation was at the middle of the two legs inside the 90-degree angle. I knew it wasn't salvageable when I first measured it at just under .1" in depth. Vans confirmed that the next day but also surprised me on the replacement cost. The longeron itself was only \$70 but shipping of an 18' piece of material requires special shipping in excess of \$300. Money is always tight but it seems to

mock you as well when it is your mistake and now you have to spend more money to fix it.

**CONTINUED  
ON NEXT  
PAGE**



**(Fuselage structure close to being finished.  
Between the work bench and the wall you  
can see the wings wrapped in old bed  
sheets)**

# RV-9 N938AG (continued)

It was also the middle of January with temps at 12 Degree Fahrenheit outside when I loaded up my truck with an 18" piece of PVC sticking out the rear window and back into the bed. I wadded up some towels and tapped them in place to block the cold and headed to Wicks in Highland IL to pick up the replacement part. After placing the extrusion in the PVC pipe, I managed to make the trip back without freezing too much.

Most of the sheet metal work was completed in eight years. It was after the structure was complete my job demanded travel 5 days each week for almost 7 years, but I was able to get back home with family on the weekends. When I was able I began the wiring, fiberglass and engine installations that took the remaining time. The wiring was one of those things I understood the least and spent considerable time learning. There is a lot of worthwhile literature on the subject and I managed to learn a lot. I took advantage of some pre-fabed wiring harnesses for my EFIS, EMS, and autopilot. I also had a friend at an avionics facility wire the radios together on a bench before I installed them in the airplane. From there, I worked the remaining of electrical and to my surprise no problems came up when I began to apply power to the different circuits. The reference materials/tables/formulas provide the facts to determine wire sizes, and lengths to ensure a sound installation, which is easy enough to follow as long as you're willing to spend the time researching. Wiring was again one of those processes where when you went to putting it in your plane, if you wanted it to look orderly, you had better be prepared to continuously remove and reinstall existing wiring for each new circuit. This allows you to have wiring that is combed out and achieve breakouts that look orderly.



**(My Dad (Weldon Garrelts) helping me hang the engine)**

I chose the Lycoming IO-320 to install on the RV-9. Van's was quick to tell me that they only installed the Carb version on their aircraft so all hoses, cables and connections will vary. So I mocked up each to assure I didn't get stuck with one that didn't fit. It amazed me how long it takes to lay these out to the point you feel comfortable to order them. According to my build records, I spent over 3 weeks modeling this out and comparing it to other builds to make sure I had thought everything through. Cooling issues on VAN's aircraft is also well documented so I spent extra time on the baffles to make sure and provide enough cooling air for our hot and humid summers.

Up to this point I kept the project in my garage. Even though it only takes me about 20-25 min to travel from my house to Smartt Field, I wanted to keep the project at my home as long as practically possible. With work and family sometimes 15 min was about all the time I could work or look at something to keep moving forward and those brief times would not have happened had the project been at the airport. When my list of things to do began to run out, it came time to move to Smartt in Nov of 2017.

The wings and control surfaces went on quickly and soon I had all the required movements on the controls. Finishing the plumbing and wiring, took much



**(My son John helping move the plane to Smartt Field on Nov 4, 2017)**

longer than anticipated. Much of this effort is not covered thoroughly in the plans and getting the correct connectors, fittings and structural support kept me busy either fabricating something new or making a purchase from Wicks or Aircraft Spruce. Many people came by as I was getting things finished including several members of EAA32. Dave Doherty would stop by anytime he would see me working in the hangar and started introducing me to many others. The amount of information available from the members was tremendous and then the chapter's tooling resources all led to me joining quickly. I had already purchased EAA packet on certifying your homebuilt but being able to get first hand information from someone who had recently accomplished this process



was invaluable. This also led to introductions of Tech Counselors Gale Derosier, DAR Frank Baldwin and CFI Mike Bradsher from EAA 1387 all of which helped review the airplane one last time, review for the Special Airworthiness Certificate, and provided dual to cover insurance requests respectively. Gale reviewed the plane in early Dec of 2018 and Frank deemed it worthy of the Special Airworthiness Certificate in mid-Dec. Insurance was the last piece of the puzzle and managed to keep me busy until first flight on 3/16/2019.



**(All together and just completed weight and balance at Smartt field. Before the flood of 2019)**

Whoever says the project is finished or complete is not telling you the truth. Fixing the findings that showed up in Phase 1, adding ADS-B and issues that arise from aircraft ownership have kept me busy. After the first couple of flights it was apparent that the skid ball was off to the left and the right wing appeared heavy.

## **Editor's Corner**

### **Life Goes On, Even in Lockdown**

Here we are, in what feels like the third year of Coronavirus quarantine. From my point of view, at least, things aren't nearly as bad around here as they are in other parts of the country. There are no roving bands of social-distancing nazis, no drones telling us to go back inside, and hopefully nobody ratting out their neighbor for barbecuing. There was a rather self-important Barney Fife type security guard at the grocery store directing foot traffic, but most folks looked at him like a 7<sup>th</sup> grade hall monitor. I do miss going out to eat, and I fervently hope all the restaurants and their employees recover from this.

I'd like to take this opportunity to thank everybody who contributed something to this and other issues of the newsletter. Mr. Bill can always be counted on to give us a peek into the wonderful world of the airlines. Secretary Dave can't write up the minutes from nonexistent meetings,

After rigging checks and verifying proper offset of the vertical stabilizer, a trim tab wedge on the right side of the rudder was added to fix the issue. That said, the performance numbers found in Phase 1 have been on or just 1 to 2 MPH off the numbers published by Van's or from the EAA sponsored CAFÉ foundation (given my attempts of determining calibration error). I have also chased down VOR antenna problems, idle RPM/mixture settings, sheared drive on a vacuum pump and air bubbles in the brake lines. My first condition inspection showed my Ameriking ELT failing requiring replacement per the AD. I also used that time to install ADS-B out with a Garmin GDL-82. At some point in time I will also need to get the plane painted to give it the appearance of being more complete. The point is, even when you supposedly finished you continue to have things to fix or improve.

That's the story of how this airplane got to this point of flying. I hope I also provided you some information about my family as well as my experience of building the RV-9. I look forward to meeting more chapter members as well as everyone at Smartt field.

but he can (and does) treat us to clever drawings and the thoughts of an aviation-loving 10-year old trapped in a middle-aged body. Our new interim president Bill Doherty, stepped up nicely and is doing justice to the post that his brother Dave held for so long. (And his articles aren't quite as late!)

Dave McGougan, Bob Murray, and Dan Garrelts heard me whining for articles, took time out of their projects, and responded admirably. Please note that Dan's RV-9 flew right before it had to vacate the airport. How great for him that the flood didn't happen a month earlier!

That's all from my head for now. Hopefully, we can all get together soon!

**Jim Bower**  
**EAA Chapter 32 Newsletter Editor**

# More Thoughts From the COVID Bunker

Dave Deweese

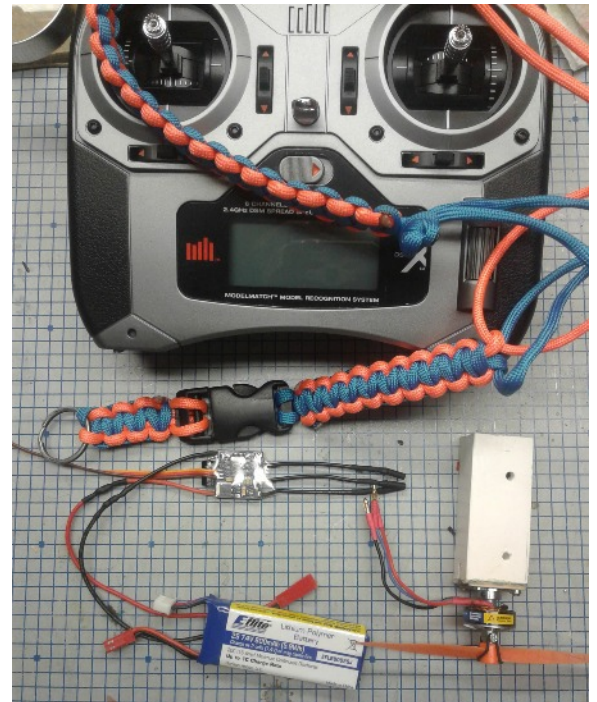
May greetings from your chapter secretary, who is adjusting to a new reality of working from home... Every. Single. Day. The Duchess of Furbottom (our cat) is pleased, but it's culture shock to a middle-aged guy who is used to commuting to an office. The upside is time saved driving, around an hour each day, which can be converted into other activities. One of these involves reviewing and sorting old pictures, including this one of a Christmas around 1972 or '73, when someone gave me this awesome space helmet. If memory serves it tended to fog up, but would make a great mask to wear to the store during pandemics.



Recognize this bird? You all know how I like to draw and sketch; coloring in my doodles with watercolors is a new trick for this old dog. The propeller needs some colored tips, but outside of that I'm almost done.



Another new challenge is around electrical skills: the gadget you see here is a radio-control sized electronic speed controller, and it turns out the builder gets to add their own connectors to the motor and battery. With time on my hands I decided to do it right with soldering and shrink tubing.





As with many crafts it wasn't as intimidating as I first thought and now feel better when imagining working on a human-scale aircraft control panel. In the time it took to order a required component I accomplished the rather more crafty project of tying a paracord lanyard for my transmitter.

The EAA Virtual Flight Academy, a set of online lessons for Microsoft Flight Simulator, is teaching me how inefficient I've been in horsing digital Cessnas through virtual skies. A nice feminine-sounding robot instructor is giving me pointers on straight-and-level, climbs, descents, and currently turns: my joystick is now programmed for elevator trim, a handy gadget, and it's becoming apparent that the sight picture made by cowlings and horizon is as effective a tool as the instruments. Who'd have guessed?

Time to get back to the virtual office: I'm multi-tasking web developer and chapter secretary tasks. In a few more hours it's back to flying machine work, specifically charging a LiPo battery to (hopefully) bring a small flying Frankenstein to life. Do you think my younger aerospace-loving self in the prior photo would be proud that I'm devoting more time to airplane related tasks, or would he shake his head that it took a world-wide lockdown to get me there? We'll go with the former.

*Onwards and upwards,  
(Do335)Dave*

## Dave McGougan's Kitfox Project

The photos are of my newly painted wings. I finished up the 2nd wing yesterday. That means all major components of the airframe are painted. I still have some touch up work to accomplish then the next big job is the windshield installation which will require two people. I will then put the fuselage on its gear and start on the instrument panel. By the way if any of our members have old instruments they might sell I am interested, I had saved mine from my old plane then lost them in the flood.

Dave m

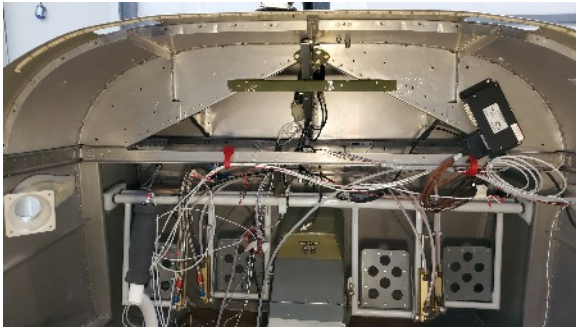


# Tearing Apart a Perfectly Good Airplane

Bob Murray

Last month, I updated you on the state of our RV-10 instrument panel EFIS (Electronic Flight Instrument System) and autopilot upgrade. At that point, a prototype bench build had most of the new avionics boxes powered up and configured.

We are now a month into the actual upgrade. This started with taking out the old instrument panel and opening every access in the airplane. Even with getting something done almost every day, there is still a big hole where the instruments used to be.



**BigHole**

A side note of interest on the instrument subpanel: If you look at that first picture, you can see the angled shape of the subpanel. For those not familiar with Van's aircraft, most have a solid bulkhead about 9 or 10 inches behind the instrument panel, between the panel and the firewall called the subpanel. Van's builders have to do some custom work here because many avionics and radios are more than 10 inches in depth with connectors and cables hanging on the back. Van's expects you to cut a hole where your radio stack or other deep instruments protrude through the subpanel and reinforce around it. If you ever want to move the radios, you now have another hole, with questionable structural strength remaining for the subpanel. Worse yet, there are three longitudinal structures in the RV-10 extending from the firewall all the way to the instrument panel. This puts some limits on where instruments can be mounted.

Mitch Smith, the builder of our RV-10, had a better idea. He is a structural engineer, worked for Piper in Florida, and is a Designated Engineering Representative (DER), which means he is approved by the FAA to make structural changes to certified aircraft. He didn't like the subpanel design so he changed it. He cut a wide triangular shape out of the bottom of the subpanel, folded the edges, and reinforced them with an extra angle and a lot of rivets. He also shortened the longitudinal structures, cutting them off aft of the subpanel, leaving the clean space you see immediately behind the instrument panel.

A side note of interest: Mitch worked at McDonnell Aircraft in the 60's. He remembers the day Mr. Mac came on the PA and announced that McDonnell and Douglas would be merging.

We are lucky to have an RV-10 with plenty of open space to mount things in and behind the panel. A somewhat ironic outcome is that we did not move the radio stack from where Mitch put it. He had it immediately right of the six pack instruments. Our 10-inch EFIS screen takes up about the same space as the six pack so it is natural to keep the GPS and radios in close proximity to the right of that. We even reused Mitch's radio mounting structure, which still bolts to the subpanel at exactly the same place where he mounted it. But we're happy to have plenty of space for things. Plus, it will be easier to route wiring through and behind the subpanel with its big cutout.

OK, back to the current status: I tend to think of an EFIS upgrade as mostly an electrical design and wiring effort. Of course, the design and prototyping of the avionics wiring did take a year on and off to complete. But when screwdrivers and drills start turning on the real thing, it immediately becomes a mechanical puzzle. The first month has been almost all mechanical installation.

The kits supplied with the Dynon autopilot servos were straightforward enough. Picture 2 shows the roll servo in the right wing. This is looking straight up at the access panel under the wing. Mounting the new heated pitot/AOA tube was pretty much done according to the mast kit supplied by Dynon, except installing it in a closed-up wing is not quite as easy as doing it during the initial build. Van's supplies an ADAHRS bracket that mounts easily enough in the tail. The ADAHRS (Air Data and Attitude Heading Reference System) has to be level with the airframe, not an easy thing to design in a fuselage with few straight lines. The \$20 piece of formed sheet aluminum that keeps the ADAHRS fixed at the

proper angle to the airframe was well worth it. But that's as far as the kits go on this project. For everything else, we're on our own.

The remainder of the month was taken up with engine instrumentation and mounting avionics boxes. The next picture shows the engine with CHT (Cylinder Head Temperature) and EGT (Exhaust Gas Temperature) probes newly installed in each

cylinder. A little harder to see is a new carburetor temperature probe. We were able to reuse the existing

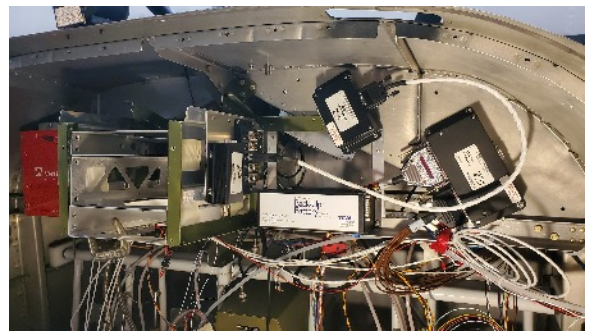
mounting for the oil temperature and pressure and the fuel pressure sensors. Actually, we're reusing the old oil temperature probe itself because the new one was a different size. We tested them both in a glass of hot water and they agreed with each



**Roll Servo**

other to within a degree. A manifold pressure sensor is yet to be mounted, as well as a new fuel flow sensor.

Most of the mechanical mounting of avionics boxes is complete. The next picture shows the boxes behind the instrument panel in their final position. This is a somewhat more complex 3-D puzzle than I would have guessed. The boxes need to be easy to remove for maintenance so we tried to avoid one box blocking access to the mounting screws of another, and was mostly successful at that. Electrical connectors sprouting a bundle of wires take more space than you would think. What looks like plenty of space for a small box becomes too cramped when the connector is plugged in. Short of a very accurate 3-D CAD drawing, it is hard to ensure clearance until you put it all together and start drilling mounting holes in your airplane. I think we ended up with only two or three small holes that were drilled but won't be used due to having to move a box from its original planned location. Its connector interfered with a GPS antenna coax cable in the original spot. In hindsight, we should have covered the subpanel in velcro and adjusted placement of the boxes until everything fit :-). Maybe on my next RV-10.



**Avionics Mounting**

That's it for this month. Will we be done next month? I hope so because our airplane really wants to get back into the air. Tune in next time to find out.



**Engine Sensors**



# How about That Heads up Display and “Where Have All the Airplanes Gone?”



mr. bill

**NOTAM:** I am required to tell you that you MUST hold this from 6 feet away from your eyes!

Thanks for the nice comments on the Boeing 737 training. Let me pass on some more info about that cool HUD-Heads Up Display. That little device is somewhat of a pain in the beginning because of its location between your head and the windshield of the airplane BUT it is such a neat crutch when you are flying a Category IIb Instrument Approach to 50 feet of altitude above the runway. (At 50 feet I must see the runway or it is a manual go around.) Below are a few of Ms. Googles videos to show you in real time about how it is all displayed. At 100 feet above ground level there is a Landing Flare Cue (the + symbol) coming up from the bottom of the HUD Display into the flight cursor. (That is the circle with the landing gear legs) to show the pilot flying how much to raise the nose of the airplane to the flare....to prevent a tailstrike!

This first example is landing in KLAX, Los Angeles, California. Airspeed is on the left, altitude on the right, and the Radio Altimeter numbers are below the flight cursor. Just keep the flight cursor over the “donut” and all is well.

[https://www.youtube.com/watch?v=jsG\\_rvyLnYQ](https://www.youtube.com/watch?v=jsG_rvyLnYQ)

So now let us try this in actual weather and fly the plane to 50 feet above the ground. Just remember with ALL instrument flying, that when you reach the Decision Altitude (DA), in this case, 50 feet of altitude above the runway, YOU NEED TO LOOK PAST THE WINDSHIELD and transition to the outside world and the Touchdown Zone Landing Lights. Then to the white centerline lights. Then to the green taxiway lights which will take you to the taxiways and the gate. Pretty cool. Here we go! Ready?

<https://www.youtube.com/watch?v=DcfUCnZlPtg&feature=share>

The scratching sound is the horizontal trim motor spinning to keep the airplane in trim. The autopilot will fly the plane but at 1,000 feet AGL-above ground level, it is autopilot off and the pilot is hand flying for the approach and for the go around if necessary. (We do not

keep the Autopilot Autoland feature updated due to the expense.) This was also decluttered mode. They are a few more symbols like Localizer and Glideslope needles but they are left off the display so you can FOCUS on the flight cursor and the “donut.” Also after landing on the lower right hand side you can see the runway remaining numbers. We have a runway display and also show the distance the plane is down the runway with a little carrot marker. Lotsa info on that indicator. So....

## WHERE ARE THEM PLANES?

Just when ya’ thought the task of hiding or storing airplanes like the B-737 MAX of which there are approximately 350 being stored in the great state of Washington at various airports, this Covid 19 Pandemic has taken that storage game to a new level. While I was in ground school training the “WORD” came out that the stored 737 MAX airplanes were being prepared for coming “on line” for service in the US of A this summer. Well..... with the Covid 19 situation these airplanes and even more airplanes around the world have been parked in some very “unbusy” places. Unbusy because in DFW (Dallas/Fort Worth) we are only using the East side of the airport. In London at Heathrow International Airport, the flight operation is only using one runway. And so the story goes. Check out this video of a private pilot flying over a place east of Los Angeles, CA called Victorville, CA.

<https://www.youtube.com/watch?v=zIbXai0l174>

This is the scene at several other airports like Pittsburgh, PA and Tulsa, OK. Very sad.

Today is April 30, 2020 and things are supposed to start to open up in the days, weeks, and the month ahead. Remember to do a thorough pre-flight with all your Spring flying. It is amazing how fast a Mama bird can build a nest in your cowlings or air ducts or air inlets and cause you to have a bad day.

Q? With this latest pandemic, the airline is losing how much money a day?

A: Estimated cash burn rate is approximately \$70 million per day.

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