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EAA Chapter 495 - Roseburg, Oregon

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Around the Patch:

by Joe Messinger
Newsletter Editor/Webmaster

It looks like we'll be meeting at the Church on the Rise, 3500 NE Diamond Lake Blvd, for the foreseeable future and this will be costing the chapter \$25 for each meeting. In order to help defray this cost the members at the last meeting, so don't go blaming this on the board, has elected to increase the suggested donation for dinners at our meetings from \$5.00 to \$7.00. Still not a bad deal. After all, have you been to Mickey D's lately? There's no comparison. Treasurer Mark Ralston said he'll have a bundle of government issued engravings of George Washington on hand to make change.

Since we were on the subject of food, at our next meeting will feature Mark's pizza. If you have had it before, you know it's a treat not to be missed, and if you haven't had it, it's a treat not to be missed.

The speakers at our next gathering will be a group of model airplane fliers that Chris Nicholls (son of Ken) has gathered together. They will be showing some of their models and talking about them. Folks, we're getting serious about this youth education program started by Paul Schafer and myself and this is just one of the first steps. We hope some of you will step up to the plate and help. If you have a kid of your own, a neighbor's kid, or grandkids who have shown an interest in aviation, this will be the perfect opportunity to get them started off on the right foot. I remember starting out flying control line and free flight models when I was younger (hold the rude comments) and it lead me to helping a neighbor build full size replicas of WWI antique airplanes for movies. Now I'm fortunate enough to be playing with the real thing.

Some other things many of you missed since you missed the meeting, and made me eat more tacos than I probably should have, was the announcement that Mark, who is a licensed A/P is putting in the paperwork with EAA National to get his certification as a chapter Tech Advisor. This means that we'll have two folks, when we count Dan Sprague, to look over your projects and make helpful suggestions. Of course during winter months, we'll only have one since Dan will escape to the warmer climes of Arizona for the winter. While the rest of us are hibernating, Dan is sunning and floating in a pool.

Mark did a very nice presentation on his Skybolt. He said he bought it about 10 years ago and there were several things he wished to change, upgrade, improve and alter so it would be more like he wanted it. So what's new? We thought that this kind of thing pretty much came with the territory. We saw photos of his work and he brought a couple of tools for show and tell that he had made in order to accomplish some of the desired tasks. Kind of reminded me of some medieval weapons of torture, but he said they were for airplane stuff. So if you're an engineer one of the first things you do before cutting, bending and welding metal is to do a drawing of what you're trying to accomplish. Very nice drawings, Mark. And you too can do the same thing. All you need is a CAD program. That's Computer Aided Design, just in case you were wondering. But these things are expensive, you say. Oh, there are CAD apps you can download for free, but most are lacking in one or more functions. The industry standard is AutoCAD, and the price runs in the neighborhood of \$1,500. And that's for a one year license. A bit dear for the casual user, me thinks. But again EAA in Oshkosh comes to the rescue. According to Mark as an EAA member you can get a copy of Solid Works, just for the asking. This is a pretty robust CAD application and is used by many professionals. The only catch is that when you print something, it will be marked, "Student Version," but who cares, you aren't going to sell it now are you? According to the Solid Works website the student version usually runs between \$60 and \$99 per copy. Not a budget buster, but you have to prove you're a student, so why not just let EAA give it to you for free?

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Rose GlaStar March 2022 Build Report

March was all about the ULPower 520iS engine installation. Step seven of the Chapter 10 *Final Assembly* consists of one page titled "Install Everything Forward of the Firewall". Fortunately, the ULPower people have a good installation manual (free download) and website discussion but there are still lots of steps needed to make it work on a specific aircraft.



The first thing that I did was make a temporary firewall, and plan out where all the firewall components and penetrations (holes) would go. These include two fuel pumps, two pre-filters, one post filter, two ignition modules, voltage regulator, battery, battery capacitor and master solenoid, cabin heat valve, fuel in and return lines, electrical/instrumentation and control cable penetrations. From past experience (two planes) I have found that after drilling the holes for something, you find out that it interferes with something else being installed later, or with engine mount components. My plan was to mount everything on the temporary firewall to make sure it fit. I spent about two days moving pieces around, configuring cooling air and fuel line routes, heater ducts, control cables, battery access, maintenance ease, etc. to get it right the first time.

While assembling the fuel pumps and filter lines, I discovered that the fittings are a mixture of AN and metric. Another challenge of installing a non-standard engine!

Because of the light engine, I have the battery located on the firewall. Rather than pay \$150+ for a battery box, I used spare aluminum parts to fabricate one. While fabricating, I got the lathe going and also completed the wing fold braces (saving another \$200) needed to support the folding wings option.



Battery box, 13 pieces, 50 rivets



Assembled Battery Box



Wing Fold (silver factory, grey mine)



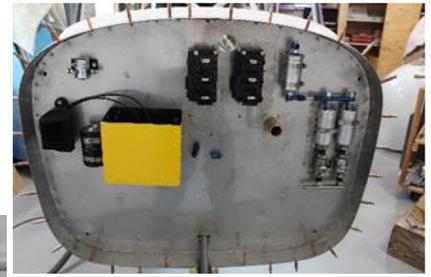
With the firewall planned, I removed the nose gear and temporarily installed the firewall. Lots of holes were drilled for the pieces. Then the firewall was removed and nut plates installed for all the bolts. I learned this strategy in the past after crawling under an instrument panel to hold a wrench on the nut on one side of the firewall and trying to turn the bolt on the other side by myself. Then the firewall and nose gear were reinstalled.

The next thing I knew, the engine was on the airplane and I can finally sit in it and make engine noises! A big step in the building process. Next, I started the job of hooking up all the components. Then a hiccup occurred. Remember all that firewall planning? I missed the manual fine print about spacing the two ignition modules a minimum of two inches apart and a factory internet post about keeping the voltage regulator at least four inches away from the modules. *(Continued next page)*



The next week was spent taking the engine off, moving the components around, using as many existing holes as possible, and drilling new ones until it was right and re-mounting the engine.

Along the way, I added an avionics shelf and firewall a stiffening brace behind the instrument panel.



Avionics Shelf



Interior firewall with cabin heat/defrost valve (left), avionics shelf bracket (top) and vertical center brace.

The first instrument panel project was fabricating a sub-panel for the various engine switches, fuses, relays and fault lights. The panel consists of two ignition switches, two fuel pump switches, a keyed starter and the Electronic Control Unit (ECU) switch, three fuses and two engine fault lights. Lots of labeled wires, connectors, busses and relays run from the panel to hopefully help make future engine noises.

The final task for the month was making up the ignition module to spark plug leads. Since the builder determines the placement of the module, ULPower supplies the leads as components for making custom length leads.



JUST FOR GRINS



We gotta get rid of those turbines, they're ruining aviation and our hearing...A turbine is too simple-minded, it has no mystery. The air travels through it in a straight line and doesn't pick up any of the pungent fragrance of engine oil or pilot sweat. Anybody can start a turbine. You just need to move a switch from "OFF" to "START" and then remember to move it back to "ON" after a while. My PC is harder to start. Cranking a round engine requires skill, finesse, and style. You have to seduce it into starting. It's like waking up a horny mistress. On some planes, the pilots aren't even allowed to do it...Turbines start by whining for a while, then give a lady-like poof and start whining a little louder. Round engines give a satisfying rattle-rattle, click-click, BANG, more rattles, another BANG, a big macho fart or two, more clicks, a lot more smoke, and finally a serious low pitched roar. We like that. It's a GUY thing...When you start a round engine, your mind is engaged and you can concentrate on the flight ahead. Starting a turbine is like flicking on a ceiling fan: Useful, but, hardly exciting. When you have started his round engine successfully your crew chief looks up at you like he'd let you kiss his girl too! Turbines don't break or catch fire often enough, leading to aircrew boredom, complacency, and inattention. A round engine at speed looks and sounds like it's going to blow any minute. This helps concentrate the mind! Turbines don't have enough control levers or gauges to keep a pilot's attention. There's nothing to fiddle with during long flights. Turbines smell like a Boy Scout camp full of Coleman Lamps. Round engines smell like God intended machines to smell.

This Month in Aviation History

- ◆ 6 April 1924 (USA) — The first successful flight around the world starts as four Douglas World Cruisers leave from Sand Point Washington, near Seattle. The four expedition aircraft, named Boston, Chicago, New Orleans and Seattle, departed with



only two of the four, Chicago and New Orleans, completing the circumnavigation as they each fly the 27,553 mile circuit. The trip lasted 175 days culminating with their return to Seattle on September 28. Actual flying time was 371 hours, 11 minutes and the successful pilots were Lt. Lowell H. Smith and Lt. Erik Nelson. Throughout the journey the crews prevailed against an endless series of forced landings, repairs, bad weather, and other mishaps that continually threatened the success of the flight. This was a monumental logistical accomplishment, and an important step toward world-wide air transport. The modified aircraft known as the Douglas World Cruiser (DWC), were powered by 420 hp Liberty L-12 engines. The total fuel capacity was increased to 644 gallons from the original 115 gal-

lons. Other changes from the original design involved increased cooling capacity, as well as adding two separate tanks for oil and water. The wing was modified to a 49 foot wingspan and a larger rudder was built. The dual cockpits were moved more closely together and a cutout in the upper wing was added to increase visibility.

- ◆ 8 April 1931 (USA) — Amelia Earhart climbs to a record altitude of 18,415 feet in a Pitcairn PCA-2 Autogiro at Willow Grove, near Philadelphia. The duration of the flight from the Pitcairn Air Field, her second of the day, was 1 hour, 49 minutes. A sealed barograph was carried aboard to record the altitude for an official record. Following the flight, the barograph was sent to the National Aeronautic Association headquarters in Washington, D.C., for certification. The PCA-2 had a maximum speed of 120 miles per hour and service ceiling of 15,000 feet with a range of 290 miles. The PCA-2 was the first autogiro certified in the United States. Operated by a single pilot, it could carry two passengers. The fuselage was constructed of welded steel tubing, covered with doped fabric and aluminum sheet.



- ◆ 16 April 1912 (England/France) — Harriet Quimby, the first American woman pilot, lands after a solo flight across the English Channel from Dover to Calais, France. In 1902 she had taken a job as a writer for the *Dramatic Review* in San Francisco and in 1903, she began writing for *Leslie's Weekly* in New York City. She attended the 1910 Belmont Park Aviation Meet and was so inspired by John Moisant's aerial performance that she asked him to teach her to fly. On August 1, 1911, Quimby received her *Federation Aeronautique Internationale* certificate and immediately joined the Moisant International Aviators, an exhibition team. She traveled with the Moisant group to Mexico and became the first woman to fly over Mexico City. Since her 70 horsepower Bleriot XI wasn't ready, Louis Bleriot loaned her a 50 hp Bleriot XI. In March 1912 she began making preparations for her English Channel flight. Her advisor, Gustav Hamel, unsure of a woman's ability to make such a flight, offered to disguise himself as Quimby and make the flight for her. She refused and decided to fly from Dover, England, to Hardelot, France (about 25 miles south of Calais). She reasoned that the Dover cliffs were dauntingly high so she secretly shipped the airplane to England. On April 16, 1912. She became an instant sensation and returned triumphantly to the U.S. By a strange twist of fate and bad luck, no worldwide fame followed Quimby's historic feat. Just two days earlier the "unsinkable" Titanic had gone down in the North Atlantic, with more than 1,500 lives lost and Quimby's feat was all but overshadowed.



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