



The ThunderWord

Thunderbird Field EAA Chapter 1217

April 2021

Scottsdale, Arizona

PRESIDENT'S CORNER

Greetings from my corner of the hangar. It looks like everyone is finally in agreement that we can start getting back to a normal life. As EAA Chapter members that means in person meetings and social events.

Earlier this month I flew with Chapter member Paul Good down to the Coolidge Fly-In Breakfast. It was a picture-perfect day with smooth air and calm winds. There was a great turnout of planes and people. Even the food was good! This was the last event until after the summer but come fall it will be on my list of fly out destinations. Chapter member Bill Lewallen had his latest acquisition, a Staudacher S-900 two seat aerobatic monoplane that is powered by a 450 hp Pratt and Whitney radial engine. It has the roar and speed of a GeeBee when he blasts off!

One of our big Chapter 1217 member participation events is our Mayday BBQ. This year we are asking everyone to come out and show their support of our Chapter. If you have a plane bring it over so everyone can have something to look at while eating.

It looks like most of the major aviation events are going to happen this year. Sun-n-Fun in Florida is happening as I write this in mid-April and Oshkosh AirVenture is a go. Stay healthy and keep a positive outlook. See you around the aerodrome!

Curtis

CHAPTER MEETINGS

START ON MAY 20

Finally, a plan has emerged from the haze of this pandemic. Your officers have a unanimous decision to get things rolling in May. Starting on May first we kickoff our 2021 EAA activities with our 22nd annual May Day-

May Day BBQ at Jack Pollacks hangar at Deer Valley, followed on May 20th with our first in person meeting in over a year.

So send up the smoke signals! After 23 years we are back to having monthly meetings!

MAYDAY MAYDAY

MAYDAY CHAPTER BBQ

Saturday, May 1, 1100-1400 will be the date & time for the annual Thunderbird Field EAA Chapter 1217 MAY DAY FLY-IN/DRIVE-IN. Jack Pollack will again host this year's event at his Deer Valley north side hangar 31-08. Things get underway around 11 am with planes arriving and setup. There are plenty of transient aircraft parking spots right in front of Jack's hangar. Be sure to bring wheel chocks and lawn chairs. At noon time we will be having an old fashioned hangar cookout.

This year the Chapter will spring for the burgers, fixin's and drinks, you need to bring something to share that doesn't need to be cooked, heated or butchered. Examples are salads, desserts, chips, and salsa & dip. We don't need a lot, as we don't want a lot wasted.

Everyone is welcome so bring your family and friends.

If you are driving, go to the north perimeter road and drive to the west entrance for the hangars. Signs will be posted, but call 602 710-4494 and we will come down and let you through the gate. It might be a good idea to bring lawn chairs to sit in. Vehicles are encouraged to park in the marked car lot spaces near the hangar ends after unloading at Jack's hangar. Please DO NOT park in the airplane wash rack or your prized possession risks an unwanted washing.

All arriving pilots are requested to NOT to use the words **Mayday** when talking on the radio.



Staudacher S-900 two seat Aerobatic Monoplane



Chapter member Bill Lewallen with his Staudacher S-900

3D PRINTING TIRES

In El Paso Texas a company called 3D Aeroventures is pioneering the emerging technology of 3D printing. Right now their product line is for radio control models but it is just a matter of time before it becomes available for experimental aircraft.

When I received an email that said color Fabb's varioShore TPU is a natural addition, I was baffled. Apparently, this 3D printable medium works particularly well for custom printed R/C tires. Whether you need a small, lightweight tire, or a large bush-style tire, varioShore TPU provides parts that are highly

Continued on page 3



3D Printed Tire

flexible and soft to the touch. The density of the material is able to be formulated to how soft or hard you want the finished part to be.

The G-code for the outer tire is optimized for varioShore TPU (soft rubber like stuff) and the central hub is printed separately out of standard PLA (hard composite material). The STL files are for a 3" diameter tire, but the files can be scaled up or down in the slicer to meet the size you need.

The company now has the ability to make 3D printed tires for the printable model line they offer. How long will it be before we will be printing tires for our homebuilt. I just paid \$1280⁰⁰ for new 8.00 x 4.00 tires for my Curtiss Jr so maybe the next set I can print up in my hangar!

ARUP REPLICA

Ken Cassens is the retired head of aircraft maintenance at the Old Rhinebeck Aerodrome. Over the years he has had a hand in re-creating several historic aircraft. In the main shop next to the Aerodrome's replica Spirit of St. Louis sat the bare steel tube frame for a small aircraft. On the bench were the beginnings of a wing with the spars laid out.

Cassens is building another airplane, the Arup S-2. The Arup was the brainchild of Dr. Cloyd Snyder, a podiatrist and flying enthusiast who hit upon the idea when he flipped a heel insert for a shoe toward his bench and the thing flew.

Inspired by this, he made some models and built a glider to test his concept. He hired an established engineer to draw up the craft and put together Arup Inc. to build and sell the craft. In 1930, he applied for a patent, which was granted in 1932.

Four variations were made, S-1 through S-4. The Arup had a surprising speed for its period, and from a small engine at that. The Arup's other asset is that it has a very slow stall speed. Something like 35 mph with a landing speed of 24 mph.

Despite the fact that the aircraft flew well and was very efficient, the company could not generate much interest in a new concept.

Some of the examples that were made ended up as flying billboards. Because there was so much wing, you could write advertising slogans on it.

Cassens is working from a very basic set of plans. But he has a great deal of experience recreating vintage aircraft. Cassens is always happy to talk about his new project. "I was the head guy, but I retired. Mike Mondello is the head guy now," said Cassens. "I'm sorta just helping him out, and doing stuff I want to. But I'm here just about every day. The Arup is my project, but The Old Rhinebeck Aerodrome will end up with it. I'm using up my stash of parts. I had this pipe dream. I've always wanted to build one." So Cassens talked with the Aerodrome board and asked if he could build it in their shop, and they gave him the go-ahead.

"The S-2's got real good performance. I wouldn't be building it if it didn't," said Cassens. "Unfortunately, there were no plans for it. All we got is a 3-D drawing, and it's pretty accurate. A guy named Allison did that. Basically, he was able to scale that drawing from photographs. He knew what the dimensions of the engine were, so he took everything based on the engine dimensions and scaled it to the airframe."

The Arup S-2 was built in South Bend, Ind. It was a concept airplane. The designer was

Continued on page 4



Jack Pollack is Nearing Completion on his Latest Project, a Bakeng Duce

actually a foot doctor. “He was interested in aviation. He built models and came up with this. He got an aeronautical engineer named Raul Hoffman to help him. The idea was: He envisioned these with hundred-foot wing spans and all the passengers would be in the wing. Seated in the wing with Plexiglas windows. It flew real well. The test pilot was

Glen Doolittle, a distant cousin of Jimmy Doolittle.

“They flew it all over the place at different air shows. But they couldn’t get funding. It was 1933 and they just couldn’t get money put together.

Continued on page 5



ARUP Aircraft Concept

Cassens is planning to put an 85-horse Continental on it. The A-40 used in the original S-2 was not too reliable and they're a flathead. Every five hours you had to oil those external valves. That (A-40) actually started the whole four-cylinder opposed engine design. Early, Continental built the A-40 and then they went to the 50s and 65s and right on up, and then Lycoming followed on the same basic four-cylinder-opposed design." The S-2 had a top speed of 100 mph on 37 horsepower so with 85 horsepower it should be faster.

"The frame was steel and the wing was all wood. They had wood spars, built-up trusses. The third and fourth one they made metal tubing spars. The wing has a span of 23 feet tip to tip." There were flaps at the trailing edge of the wing. Initially, there were ailerons. But on the test flight they didn't have enough roll rate, so what they did was they locked them off and made them adjustable for trimming and the rounded flaps off the end of the wing were the ailerons.

"One other unusual thing is you enter the airplane from underneath. There's a bi-fold door that forms the bottom of the wing and the

side of the fuselage. And you just walk into this section here. You sort of turn and inch your way into it."

You got to get a little gymnastic to get into it. In the side of the fuselage on each side there's a window and in the bottom of the wing there's a window. Because it sits on the ground like this and it comes in like that, too with a high angle of attack. It lands at 23 mph and takes off at 25. There is 211 square feet of wing."



Chapter member John Rippinger is working on a glider rating

AIRCRAFT STRUCTURE

AS A BATTERY

"Massless" carbon fiber battery doubles as a structural component. From electric planes that can only fly for so long to electric cars that need to pull over for a recharge every few hundred miles, heavy, bulky batteries are a huge, limiting factor in how far these types of vehicles can travel. Scientists at Chalmers University of Technology have been exploring an interesting alternative to these conventional energy storage solutions and are claiming a big breakthrough, demonstrating a new type of "massless" battery that could work as a power source and structural component of a vehicle at the same time. The research team at Chalmers University of Technology has spent years investigating the idea that batteries can double as structural components to save on weight in vehicle design. Carbon fiber is a key pillar of this research, owing to its excellent and well-known mechanical properties, along with its ability to act as an electrode material when engineered in the right way. The newly developed "massless" battery has an energy density of 24 Wh/kg, which the team notes is around 20 percent of the capacity of today's lithium-ion batteries

The battery consists of a negative electrode made from carbon fiber and a positive electrode made of a lithium iron phosphate-coated aluminum foil. These are separated by a fiberglass fabric that serves as a structural electrolyte matrix, which both transports the lithium ions between the electrodes just like in a conventional battery, but also helps spread mechanical loads to different parts of the structure.

The researchers describe this as a "massless" energy storage device because, unlike a

conventional battery, it doesn't add any extra weight to the vehicle, at least in theory. That does involve some compromises, however. On the other hand, if this battery were integrated into an electric car in place of a typical lithium-ion one, that car would weigh a lot less and therefore require less energy to propel it across the ground. As for its mechanical properties, the team says the material has a stiffness of 25 GPa and can compete with other commonly used construction materials.

"Previous attempts to make structural batteries have resulted in cells with either good mechanical properties, or good electrical properties," says Leif Asp, leader of the project. "But here, using carbon fiber, we have succeeded in designing a structural battery with both competitive energy storage capacity and rigidity."

The researchers say this new design offers a tenfold performance improvement over previous attempts at a structural battery, but they are quickly turning their attention to even loftier ambitions. The next phase of their research involves replacing the aluminum in the positive electrode with carbon fiber to further boost energy and mechanical performance, while the fiberglass fabric will be replaced with a thinner version to promote faster charging.

Asp guesses that this battery could offer an energy density as high as 75 Wh/kg and stiffness of 75 GPa, making it as strong as aluminum but a lot lighter. From there, the possibilities for electric vehicles and even consumer electronics could get really exciting.

"The next generation structural battery has fantastic potential," he says. "If you look at

Continued on page 6



Virgin Galactic Newest Spaceplane

consumer technology, it could be quite possible within a few years to manufacture smartphones, laptops or electric bicycles that weigh half as much as today and are much more compact."

NEW UNIVERSITY AT FALCON FIELD

Falcon Field Airport in Mesa, Ariz., is home to California Aeronautical University's new campus, which will offer degree programs in aviation studies, aeronautics and business administration, along with various ratings and

certificates. "We hope to show students that becoming a professional pilot or other aviation professional is not only possible, but is a realistic long term career option," CAU President Matthew Johnston said

SCOTTSDALE AIRPORT CLOSING

Scottsdale Airport has plans to resurface the runway and will be closed starting July 1 for 45 days. If your flying might be impacted you should look to the airport website for exact closure dates.



Thunder Ads

ADS-B TRANSPONDER & MISC.

Appareo Stratus ESG 1090MHz ADS-B transponder, Stratus 2i 978 MHz UAT w/WiFi, RAM AV-74(-1) DME/Xsponder blade ant., rack mount, pre wired cable harness, GPS WAAS ant., GPS triax cable, \$3,000⁰⁰, Goodyear Flight Special II 500-5 6 ply tire, \$80, 4 Barry engines mounts 94510-41, \$400⁰⁰, Dynon D-10A EFIS w/ remote compass & temp probe, \$2,000⁰⁰, Charlie Spinelli, 206 678-5678, Spinellc@msn.com

CURTIS F11C-2 "GOSHAWK"

Built by John Pike. R-1340 (600 HP). Less than 120 hours TT since new. Becker com & txpdr, Garmin ADS-B, 20 gal smoke tank, 102 gal fuel, <https://CaptainBillyWalker.com> 480- 773-2823

AIRCRAFT TOOLS

I have some aircraft tools that I acquired through a friend. I would like to sell them. Dan Burdett 480-600-2865

SCHWEIZER 1-26C GLIDER

Complete restoration, new fabric and paint. New skid, new tire and canopy. Has cg hook and factor tip wheels. Trailer with new tires, lights and wheel bearings. This glider is 100 % legal and ready to tow to field and fly today. \$10,500.⁰⁰ Jerry Lane - 602-663-2432

MISC GOODIES

King KT-76 transponder, antenna and encoder \$500-, **Continental 0-200 case** with data tag and extras. \$500; RV-3 canopy brand new never cut \$200, **Douglas DC-4 pedestal** with throttles and controls. Perfect for your man cave \$100. Curtis Clark 602 710-4494

LONGEZ AND SONEX

Tom Partin has decided to stop flying and has two airplanes for sale at Thunder Ridge air park (AZ28), a 180hp LongEz and a 120hp Sonex. Contact Bertha Partin at bmpartin@gmail.com

THATCHER CX-4 PLANS & BUILDERS MANUAL

New, never used, donated to our Chapter. Curtis 602 710-4494

ALASKA BABY BUSHWHEEL

tailwheel assembly, Like new. 6x8.5 tire Used but in good shape, Jack Pollack 480 695-4441

COOL PLANES FOR SALE

Only flown by little old ladies to church on Sundays. <http://captainbillywalker.com/aircraft-for-sale/aircraft-for-sale>

RV-4 PARTIALLY BUILT KIT

\$13,500 Lycoming 0-290-D2, kit for \$3,000 or \$16,000 for both. Wanda Refrow 602-843-9862 w7lov@cox.net

LYCOMING 0-360 A1A

Engine built up for RV project never completed. Invested \$50,000. Price very firm at \$25,000. Martin Del Giorgio delgiorgiopels@gmail.com

GARMIN GDL82 ADS-B "Out" DATALINK

Designed to work with your existing transponder. Slightly used. \$1,200⁰⁰. Ken Roth 602-228-5000, RothDevCor@aol.com

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Eloy Airport Julie White 520-466-3442

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