EAA THE SPIRIT OF AVIATION

RUNWAY 35

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Inside this Issue

Next Event

June 13

9:00 am

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Selecting Your Fabric Covering By; Mark Julicher

Fabric Covering has been around for over 120 years. That is hard to imagine, but it is true. Even before the Wright Flyer, dozens of experimenters used fabric to cover wings. World War I airplanes were fabric covered. Zeppelins were fabric covered. Spirit of St Louis was fabric covered. The control surfaces on nearly all WWII planes were fabric covered. Fabric as a covering works well, and today many airplanes are still being covered in fabric.

Taylorcraft done in Air Tech
The plastic blades of the spray booth exhaust fan melted. Yes it is toxic

Granted, the covering process has changed somewhat. Virtually no one uses four ounce Grade A cotton anymore and is probably no longer produced in the U.S. Then there is Irish linen which is super expensive and used on heavy duty aircraft. These organic coverings work very well but are not known for longevity. Typically after five to ten years their strength is gone and they will no longer pass the tensile strength test.

Most fabric planes now use one of several processes based on Dacron. That means Ceconite, Poly-Fiber, Superflite, or for experimental aircraft, unbranded Dacron are the fabrics of choice. Dacron lasts many years, 25 years or more is not uncommon if the plane is hangared. The enemy of Dacron in ultraviolet light. Uncovered Dacron in full sunshine loses 50% of its strength in one year. Dacron must be protected from UV light with silver dope or additives in the more modern coatings.

Before you start covering your plane, obtain the latest covering procedure manual and read it. read it twice. Here then is the author's non-definitive, highly opinionated, and incomplete treatise on fabric coating systems.

What then are the processes that may be used to cover your plane?

Processes (known to the author and apologies to any that were missed)

- Ceconite fabric with **Randolph** coatings
- Poly-Fiber fabric with **Poly-Fiber** coatings
- Ceconite or Poly-Fiber fabric with **Air Tech** coatings
- Ceconite fabric with **Certified** coatings
- Ceconite fabric **Stewart Systems** coatings
- Superflite fabric with **Superflite** coatings

(Continued on page 4)

JUNE: Chapter Clean-up and Member Picnic

0900 – Clean-up

Picnic to follow

BRING:

Gloves, gardening tools, hats, face-coverings

Subject to change due to weather or COVID concerns – please watch e-mail and Facebook page for last minute updates!

PRESIDENTS COCKPIT **DARREN MEDLIN**

Welcome to your June EAA 35 Chapter newsletter. I hope you and yours are safe and well. We had a great May gathering, via Zoom, with a presentation from Scott Musselman of Texas Aircraft. Chuck Fisher recorded a weekday factory interview with Scott that showed us all the work areas and workers putting together this neat Special Light Sport Aircraft called the Colt. Taking advantage of the online tools, Scott joined us from his hotel room in Arizona, where he had stopped enroute after visiting with a California flight school to show off the plane. Scott answered questions about the presentation, the plane, and the company's future for almost 30 minutes.

The following Friday your chapter VMC club, led by Rafael Cortes, held a guided discussion about pilots' options in a scenario that involved a chemical smell in the cockpit and then loss of electrical power during flight. These scenarios are all based on real world experiences from VMC/IMC club members and are a great opportunity to "pre-fly" situations that can be hard to train for.

June may see our first face-to-face gathering since the virus restrictions as we hold a combined chapter picnic and work party. See Chuck's article on what to bring and keep your finger's crossed for great weather and safe conditions for this meeting. More info regarding masks, distancing, and other special protective measures to keep us healthy as we grill, clean and eat will be sent so check your email.

Our 8 May business meeting addressed our Ray Foundation Scholar selection plan, the October B17 visit planning and a change to Tuesday at 7pm prior to the monthly gathering for future business meetings so more committee chairs can participate. The board is working on a long-term flight plan for the chapter and has homework to capture our short- and long-term tasks for the plan. Look forward to hearing more on that. Officers, Directors, Committee chairs, and other interested members mark your calendars for Tuesday, 9 June, 7 pm for the next meeting. Info to join by video and phone will come out separately.

If you made Airventure reservations for this year you've either requested a refund or rolled your tickets and/or lodging over to Airventure 2021. Either way make sure to mark your calendar for July 26st to August 1st 2021 for next year's event.

You make our chapter fun so share you ideas and I look forward to seeing everyone at our gathering on June 13th. That date is also when , in 1983, that the first human made object departed our solar system. Look up space probe Pioneer 10 for more info. See you soon!

June Gathering, By Chuck Fisher VP

It is summer and we are hoping a healthy one! To that end, the plan for June will be a safe, responsible, outdoor get-together!

We are planning a morning/half or more day work-party to clean and improve the clubhouse grounds, take care of some maintenance needs, and maybe even build some more seating for future events. In the end, we want to be prepared for a re-emergence fly-in in July!

We will follow that with our annual chapter member's picnic.

So, pay attention to the times! We will start the work-day at 0900. We will have the picnic when we are done....The more of you that come to work, the earlier we can eat!

This year we will concentrate on outside projects and only a few necessary indoor projects, so everyone can maintain a safe distance they are personally comfortable with. We will try to have any parts, pieces and supplies we need already in place.

We will need you to bring personal gardening and lawn care implements, gloves, hats....and masks.

We will NOT need food donations for this event! We will provide guidance for how we can safely package and serve donated food items in future newsletters, but for now we will plan to serve only pre-packaged or fresh prepared-on-site items.

Our plan is to do as much as we can outdoors so we can maintain ventilation and personal spaces. Your job will be to respect other members and resist the temptation to get too close especially if you don't have your mask.

Of course, IF the virus situation worsens, weather intervenes or there is new city or county guidance that makes this sort of gathering unwise, we will plan an alternate to divert to... which will be another Zoom gathering on a topic to be announced once I think of it. SO, be sure to check your e-mail and our Facebook page for updates.

We hope to see you all in June!

CHAPTER BULLETIN BOARD

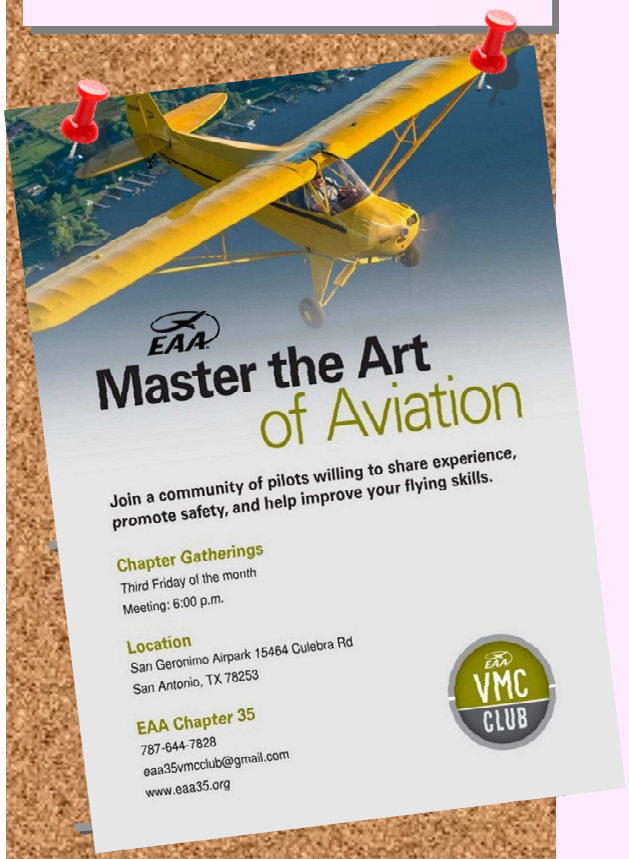
After 14 years as EAA Chapter 35 Membership Coordinator it's time to share the fun. I am ready to share with others.

The Membership Coordinator is a great chapter position. If you like to meet people, keep track of the members, help recruit new members, this is the job for you!

Contact EAA Chapter 35 President Darren Medlin,

president@eaachapter35.org to apply.

I will be available to help with the transition. It's been great working with everyone over the years and I'll be happy to help in any way I can.



June Menu and Notes

Clubhouse work-morning followed by member picnic!

We will have hamburgers, hot dogs, chips, beans and drinks

Needed:

2 charcoal grills (please contact vicepresident@eaa.org to volunteer)

4 or more servers

All food will be provided on-site or pre-packaged. We will NOT need food contributions.

We will be eating OUTDOORS so bring your hats and sun-screen. Please do bring face-masks/bandanas as you might be inside other's comfort/safe zone even when outdoors.

For the picnic, we will need servers and I need a couple of folks to bring charcoal grills (we'll have charcoal). We will be doing things a little differently this year as we cannot do a serve-yourself buffet. The "food-handlers" wearing gloves and masks will prepare plates for you and we will use single serve drinks and single serve utensils. So, we will need more servers than usual to set up a serving line.

Continued … Choosing a Fabric Covering

(Continued from page 1)

- Ceconite fabric with Ditzler's coatings (Developed by Ken Blalock who later collaborated to develop Air Tech)
- Ceconite with **Star Gloss** (brand new urethane coatings system from Consolidated Aircraft Coatings)
- **OraTex** (not certified in USA, but STCs available)
- Razorback (defunct)

Aeronca Champ done in Ceconite with Randolph dope.
Much of this was sprayed in open air on calm, dry mornings.

- Blue River (improved and morphed into Stewart systems)

Certainly more that the author knows nothing about.

Of all thee processes, this author has used those marked with an arrowhead . Naturally there are pros and cons with each system.

Old School covering means dope and fabric. Originally that meant nitrate dope (cellulose dissolved in nitric acid). Somewhat later, butyrate dope was developed (cellulose dissolved in butyric acid.) Butyrate is less flammable and not as prone to causing explosions in your spray booth. Back in the 1930's and 1940's explosions in spray booths were all too common and many workers at various factories were killed.

Now, butyrate dope won't stick to Dacron, so nitrate dope must be applied first followed by coats of butyrate. Dope finishes look good, just be aware of the hazards—NO ignition sources near your spray area! Even the spark from a light switch can ignite dope fumes.

New School covering means urethane applied over Dacron. Urethane does not stick to Dacron very well either, so each coating system has its own primer used to both fill the weave and prepare the surface for urethane.

Newest School is Oratex. This is a fabric with built-in coating. It is glued on and shrunk with heat. If you ever used Monokote on a model airplane then you understand this process. Oratex is available to two different weights depending on its final application.

Let's double back and discourse on dope finishes.
A typical dope finish (i.e., Randolph or Certified Coatings) is at least 13 coats of liquid, perhaps more. Dope can be buffed to a high gloss. Because dope helps tauten the fabric the Dacron is not shrunk as aggressively as it could be. (Yes, even "non-tautening dope will tauten a little bit.)

Applying less heat shrinking is an advantage on light structures such
as Aeronca 7AC wings where the ribs are delicate and may deflect under fully tautened Dacron. Putting cross bracing tapes on the ribs reduces this problem somewhat. Now certain covering manuals say that tautening should not damage any structure, but personal experience says otherwise. For this reason, this author prefers dope and less aggressive shrinking on Aeronca wings.

Dope finishes can be rejuvenated. When a plane has been out in the elements and the finish is starting to look shabby, a coat of rejuvenator adds flexibility and life back into the coatings. Rejuvenator won't restore weak fabric, just the finish.

Dope Advantages:

- Vintage airplane look
- Shiny (can be flat too)
- Can be rejuvenated
- Easy to repair
- Protective spray equipment is charcoal respirator and skin covering
- Easy to apply.

Dope Disadvantages:

- Thirteen coats is a lot of spraying
- Nitrate first coats are flammable - downright explosive as a mist
- Nitrate and butyrate use different solvents so perhaps a little extra expense in logistics.
- Solvents are volatile and toxic.

Poly-Fiber with Poly-Tone topcoat is almost the same as a dope finish, the process is in many respects the same but somewhat easier. It only requires about eight coats of liquids. Poly-Fiber liquids are based on vinyl instead of cellulose and all Poly-Fiber liquids use the same solvents. Vinyl can be manipulated with heat whereas cellulose not so much. This means that fabric tapes and pinked edges can be adjusted and smoothed using a shrinking iron— a big advantage.

Poly-Fiber still relies on base coats to fill the weave followed by silver to protect from UV and finally color coats. Poly-Fiber liquids do not cause additional shrinking in the fabric, therefore the Dacron is shrunk to its maximum before applying liquids. The Dacron is fully thermoset at 350 degrees F. As an example, Taylorcraft ribs, are much stronger than Aeronca ribs and withstand maximum shrinking just fine.

(Continued on page 5)

Continued … Choosing a Fabric Cover

(Continued from page 4)

Poly-Fiber's Poly-Tone top coat is not as shiny as dope unless buffed out and perhaps waxed (carnauba wax only PLEASE). Poly-Fiber is a very forgiving process and easy to learn.

Poly-Fiber Advantages:

- Fewer coats than dope finish
- Can be rejuvenated
- Easy to repair - even easier than dope finish
- Protective spray equipment is charcoal respirator and skin covering
- One solvent needed although chose hot or cool weather formula.

Poly-Fiber Disadvantages:

- Not quite as shiny as dope
- Still flammable but not quite so explosive during application
- Solvents are volatile and toxic.

Dopes and Poly-Fiber use acetone, MEK, and toluene in varying amounts as reducers. It is not too good to breathe this stuff, but a charcoal respirator and some safety goggles offer good protection.

Citabria 7KCAB going together with Certified Coatings dope. Very heavy bodied dope that goes on nicely when thinned correctly

Now let's talk about urethane finishes.

Randolph and Poly-Fiber and Certified Coatings all have urethane top coats available. Once the plane is complete through silver coats, a urethane top coat is an option with these processes. Air Tech, Stewarts Systems Superflite and Star Gloss have only urethane top coats.

Highly modified Super Cub done in Stewart Systems. Get the manual! Watch the videos! Follow the directions to the letter.

Urethane is shiny, oh so shiny, and possibly heavy (author's opinion and experience, your mileage may vary.) It is hard to beat the beauty of a newly painted plane done in urethane. Urethane finishes as would be applied to a metal airplane are hard and glossy and beautiful. However, to use urethane on fabric it must remain flexible. Some urethanes are not suitable for fabric and the manufacturer will tell you so. Some urethanes have flex additives and will work on fabric for many years. That said, after some period of time the urethane finish may crack and chip and "ring worm."

The author has finished three fabric planes using urethane designed for fabric. In two cases the urethane began to fail in 10 years. In the third case it is newly done and too soon to know. You may see planes with urethane applied to fabric in the '80s - still flying but not looking so good in many cases. But hey, 40 years longevity is not so bad either. With urethane you should expect to see hairline cracking along longerons and wing tip bows in a few years. Not terribly noticeable, still airworthy, but not able to be rejuvenated either.

Of all the contemporary urethane top coats, only, Stewart Systems does not contain volatile organic compounds and is therefore useable in locales where restrictions apply to VOCs. Ranthane, Aerothane, Air Tech, Superflite, and Star Gloss and to some extent Stewart Systems require GOOD skin, breathing and eye protection.

Not that anyone should spray anything without lung protection, but just be advised that when your skin begins to tingle and go numb and your eyes start to burn you ought to be thinking that a spray suit and hood would be a good idea. A charcoal respirator is not sufficient with any urethane products except Stewart Systems. Forced-air paint hood and clean air source will protect eyes and lungs from chemicals that can go right through charcoal respirators.

Contrary to many opinions, urethane can be repaired if the right techniques are used. Maybe not as repairable as dope or Poly-Fiber, but do't let the possibility of a repair on a puncture scare you off if you prefer a urethane.

At the time of this writing, Star Gloss manuals are just being delivered. It will be interesting to see what advantages these new chemicals have over older urethane systems. The author is waiting for a copy of the manual by snail mail.

Blue River was a waterborne covering system that had varying degrees of success. Love it or hate it, the process was sold and improved and eventually became the current Stewart Systems. So no more Blue River. But the much improved Stewart Systems seems to work well and lasts a long time. By the way, online videos of the Stewart Systems process are excellent! By the way, Stewart Systems is manufactured in central Ohio. Now waterborne goods from central Ohio could freeze during shipping, so Stewart Systems is drop shipped with an insulated heat pack. Very clever!

(Continued on page 9)

A GLIMPSE INTO SAN ANTONIO HISTORY

The Ruggles Disorientator by: **Chuck Fisher MD**

Wings was a silent movie filmed in San Antonio in 1927. It won the very first of what would thence be called the academy awards, and remains an epic aviation movie even nearly a century later. For a good article about the filming of wings in San Antonio. In the movie there are scenes from around San Antonio, and one that caught my eye in the early part of the moving is a scene of cadets using a Ruggles Disorientator in front of the former Brooks Field hangars and its operations building (long since demolished) here in San Antonio. Few modern aviators would recognize the device or the reason it was used a century ago.

Figure 1 The heroic stars of WINGS (1927) - publicity photo

So, here is a bit of historical trivia from the early days of aviation.

Prior to WWI the US had almost no military aviation capability. The US military aviation department consisted of a single ill-equipped group of aircraft that were used as observers to chase Pancho Villa along the Mexico-US border, but as writers in ***Aviation Weekly*** put it, the aviators devoted more time to locating other downed aviators than they did looking for Pancho Villa. Neither pilots nor aircraft were prepared for any sort of military operation. Pilots were often assigned because they had become unfit for soldier duties, so a sedentary, seated job was seen as a way they could still be utilized. Superimposed on this sad state of affairs, the United States was drawn toward and eventually into World War I; and the French, British and Germans had already begun rapidly developing aerial warfare, aircraft and pilots. However, their experience using similar selection criteria, had been that pilots often had a career expectancy of only a few flight hours. This was clearly undesirable.

Figure 2 Ruggles Disorientators in front of the operations building at Brooks Field - screen capture from WINGS 1927

The Army Surgeon, General (Doctor) Gorgas and his son in law Thomas Lyster MD saw a looming war threat and knew the Army would need thousands of pilots in short order. However, the US lacked any means to select pilots, and no one knew what characteristics would be most important to being a successful pilot. The physicians knew they had to do something to select pilots most likely to survive and be effective or face the spectre of thousands of needless deaths.

So, completely without Army direction, they began to assemble physicians who seemed most likely have any familiarity with the stresses of flight. Among those was an Otologist (ear specialist) named Isaac Jones MD. He had studied mechanisms of balance and had worked out a theory of how the semicircular canals and the utricle worked to detect head movement and motion. He had actually flown with Eddie Stinson in San Antonio on at least one occasion, making him remarkable among physicians, and like many physicians of the day, was an Army Reserve officer. He presented a lecture for the physicians in the Washington DC area that Thomas Lyster MD attended regarding the mechanisms of orientation. Dr. Lyster did not forget that lecture, and when General Gorgas gave him the task to find a way to select pilots from among candidates, Dr. Lyster called on his professional colleague to help.

Dr. Lyster assembled a small team of physicians, mostly ENT, Ophthalmology and Cardiology specialists to develop a set of criteria they felt were most important to the success and safety of an aviator – although at that time few physicians had ever even been close to an aircraft, and even fewer had actually been in the air. Yet, within weeks they developed a set of physical standards including good eyesight, normal color vision, standards for heart rate, blood pressure, height, weight, strength and reflexes that, incredibly, are remarkably similar to the standards we use a century later. Among those standards, based on the work of Dr. Jones, was testing to ascertain if a candidate had normal inner ear function sufficient to maintain balance and orientation. During that period of time several diseases such as mumps and measles could damage the ear and vestibular mechanism.

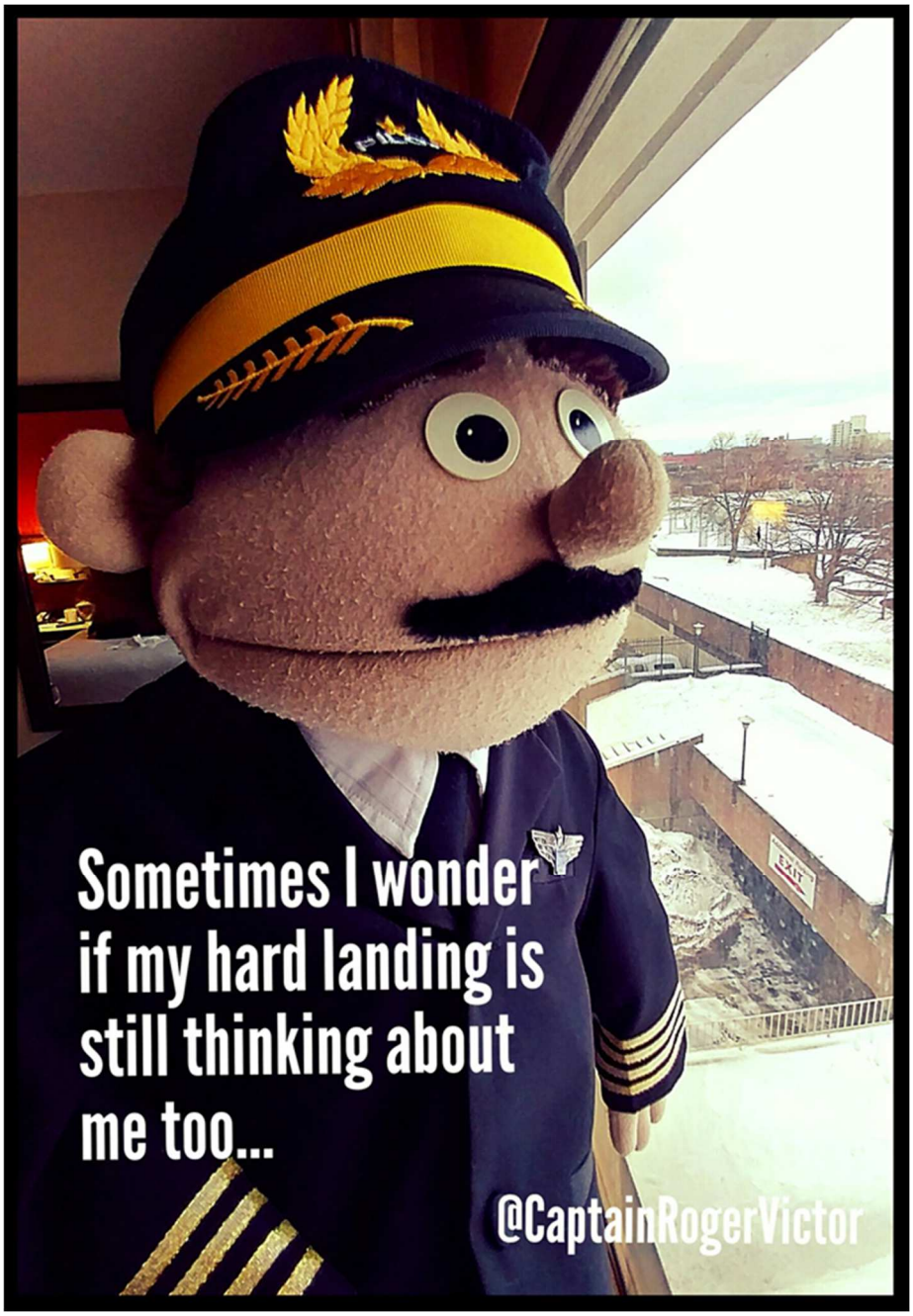
The theory was that pilots with a defective sense of orientation would become confused in clouds or while flying and crash. Thus, based largely on the experimental work of Isaac Jones MD, a series of tests were devised in which candidates were spun in a Barony chair and their re-

(Continued on page 10)

Improve Your Landings

By Paul Wurster, ATP, CFII:

I hope you have gotten out and enjoyed some of this beautiful weather and sub-three dollar AV Gas. However, if you have not turned a wheel over the winter, it is time to knock off some of the rust. I want you to work on getting your landing mojo back. Here is one thing to work on that I find has the biggest bang for the buck for improving your landings.



If you think back to your worst landings (and I know you do), they probably have one thing in common. No, not a loud expletive and quick excuse about a surprise gust of wind. Many of us critique the things that happened in the last few seconds before the bounce, skip, slam, or hard landing, but the root cause of our shame usually started a little earlier in the pattern or on the approach. The airlines and jet operators have long since figured out that a stable approach is the key to a safe landing. I want you to practice flying a stabilized approach to landing.

You can easily set up a stable approach by making sure you are flying a constant vertical velocity and approach speed. Your POH probably has an approach or landing speed clearly stated or you use 1.3 times your stall speed. That same POH will not list your VVI. Here is how you figure out what it should be. You can determine your desired VVI by multiplying your groundspeed on final by five. (ie. 60 knots x 5 = 300)* If your approach speed is 60 knots, then you fly approximately 300'/min VVI on the approach when there is no wind to achieve a 3 degree glideslope. If you are flying 90 knots, you would be looking for 450'/min VVI. If you can go and find a power setting and configurations that reliably hits these numbers, you will be able to set it on final and make small corrections to dial it in. Now, practice this set up and see if you can maintain this descent rate.

The next step is to apply this setup while on final. If you can practice on a longer approach, you can really get your parameters dialed in. If you have the ability, dial up an ILS and do a touch and go at Kelly or San Antonio. They are not busy right now, and you can even do this while flying VFR. The ILS will bring you in on a 3 degree glide slope which is what you want on any final. Apply the parameters from the paragraph above and you should have a nice stable final approach which should not require constant or large changes to pitch and power. This takes you down "the chute" and puts you into the right position to execute a beautiful roundout to landing. When you get back to a VFR pattern, you will have a shorter final segment, but you still must get into the 3 degree chute prior to landing. If you cannot, strongly consider going around.

Let me know how this works out for you and if it helped improve your landings. If you need some help knocking off the rust let me know. That perfect landing is just waiting for you.

* Multiplying your GS by 10 and then divide it in half is an easier way to get your desired VVI. If you see 75 knots GS on your tablet, put a 0 on the end and then divide by 2. 750 divided by 2 is 375'/min.

EAA 35 Safety Brief by Ron O'Dea

Tips to protect your plane from bad fuel

APRIL 19, 2020 BY BEN VISSER 18 COMMENTS

I recently had a note from a gentleman from California who flies out of a local airport. In the last few months his aircraft has developed several fuel leaks. When he checked around, he discovered that other pilots at the same airport are also experiencing fuel leaks.

Additionally, one of the pilots noticed a higher than normal EGT for his normal fuel flow at cruise. When his engine was inspected, it appeared that several cylinders had run hot and experienced knock or pre-ignition.

On top of all that, the fuel just smelled wrong, according to the pilot. Rather than the regular smell of 100LL, this fuel smelled like "wet socks," he reported.

What is wrong with the fuel?

It all starts with the aviation fuel system at the airport.

Aviation fuel systems have several differences from auto-gas fuel systems.

With avgas, the tank is supposed to be installed slightly off level (less than a degree) so that any free water in the tank will run to the low end and can be sumped off. Many of the tanks also have a pocket at that end so that the water is more easily located.

Avgas tanks also are supposed to be installed with floating suction, so that the fuel pulled out of the tank when you are fueling your airplane will be drawn from the top and not pick up any of the contaminants that settle to the bottom of the tank.

Another major difference between aviation and auto fuel tanks is filtration. In an aviation fuel system, there should be a filter separator that removes any free water and any particulates from the fuel.

The problems begin gradually. Over the years, the aviation fuel tanks will settle, which means the water is not drawn to the lowest point of the tank.

Instead, it often collects in a dead space at the bottom of the tank.

Over time, the water at the bottom of the tank attracts — and retains — all kinds of things that are bad for your airplane, such as surfactants, ethanol, microbial growth, rust, dirt, and many other harmful things.

Over the years, the junk and contaminates continue to accumulate because they are more attracted to the water than the fuel. As it becomes more contaminated, the fuel begins to smell bad.

This becomes a big problem when new fuel is added to the tank, stirring up the whole mess. If adequate time is not allowed to let the bad stuff settle back to the bottom of the tank, it can be drawn into the fuel inlet and then into your airplane.

Another potential problem is when the floating suction on the inlet doesn't float due to a compromise of the float system over time. This allows the float to sink and the crud on the bottom to be drawn into the fuel inlet.

Once this bad fuel is drawn into the inlet, it enters the fuel filter separator and can disarm the water separator part of the system. Then the free water can weaken the particulate filter and allow the contaminates to enter the aircraft tanks.

Here contaminates like ethanol will attack fuel system rubber components, causing leaks, while the microbial growth can attack metal in the fuel system. Meanwhile, particulates can plug passages in your carburetor or injection system. This can lead to bad fuel distribution and an overheated or detonating cylinder.

Where do these contaminates come from? The water comes from leaks in seals and fuel condensation. Other contaminates come from poor housekeeping and the distribution system.

While many fuel distributors have dedicated trucks to deliver 100LL, not all of them do. Additionally, the fuel distribution system at most distributors have common piping and control valve systems somewhere in their plants.

The bottom line is that water and other contaminants are going to get into the fuel distribution system, so they must be managed properly.

(Continued on page 9)

Continued … Choosing a Fabric Cover & Safety Brief

(Continued from page 5)

Razorback was a system whereby light weight fiberglass was adhered to old cotton fabric that would no longer pass a punch test. Razorback is heavy. Razorback is no longer available.

Urethane Advantages:

- Shiny tough finish.
- Fewer spray coats than dope or Poly-Fiber

Urethane Disadvantages:

- May crack over time. (varying experiences with different products)
- Toxic to spray. Advantage to Stewarts Systems, but it will still burn your eyes so you need protective gear.
- May be heavy (author's opinion only, the marketers say otherwise.
- Repairable but not as easy as dope.

The new kid on the block is Oratex. Oratex is almost exactly like covering a model airplane with Monokote. Glue it on, shrink it, and it is done. Color and ultraviolet protection are built in.
Oratex is certified in Canada and Europe. There are STCs for Oratex on many planes in the USA. Beyond that, this author can't tell you much. It appears to go on very fast. There are no chemicals to spray, and Oratex claims it is light weight. There is lots of information on their website and they have booths at major fly-ins. I think this new stuff is worth a look.

A few last thoughts on dope processes:

As a contrarian sort of person, and because certain literature said that Certified Coatings was very reasonably priced, The author decided to do a cost comparison by adding the prices for the recommended amount of liquids, i.e., dope, reducer, etc, to cover just the fuselage and tail feathers of an Aeronca 7AC. Three processes from bare fabric through fill coats, silver coats and a top coat of Insignia White were compared - white being about the least expensive color in any given process.

Using dealer's price for Randolph dope, Certified Coatings, and Poly-Fiber the numbers shake out like this:
Randolph dope: $932.77
Certified Coatings: $915.94
Poly-Fiber/Poly-Tone: $769.04

It would be a simple matter to extend this comparison to the other covering processes… maybe some other day.

One last note regarding Certified Coatings dope. The dope itself is good stuff. No problem, but the standard color pallet for Certified Coatings is limited. If you want something other than their standard colors it will take extra time and extra cost. Lastly, the lead time to obtain Certified Coatings is as much as five weeks, so bear that in mind when you start your project.

Expect a future article or articles detailing the author's tricks of covering trade and some common goofs and how to correct them.

(Continued from page 8)

Quality Assurance

Every avgas dispensing system needs to have a comprehensive quality assurance program. For example, FBO or airport personnel need to check the floating suction EVERY DAY to ensure it is still floating. They also must sump the water draws until clean dry fuel is noted.

In addition, the filter separator needs to be sumped and the differential pressure across it measured and recorded while fuel is being pumped.

I have found many systems where the differential pressure was recorded as zero for a long time, only to find that the filters had been ruptured and were not doing anything.
What can you do to protect your aircraft?

So, what should a pilot do to protect their aircraft? First, get to know your fuel supplier really well. Review its quality practices. I have seen some EAA chapters do this for their area.

Once you know where you get your fuel is spot on, frequent these suppliers as often as possible.

I know this can be a problem on cross country flights, but use common sense and ask questions. Most FBOs are proud of their systems and will gladly show you or discuss their operations.

Lastly, never — and I do mean never — refuel right after a fuel delivery. If you do pull up to an airport's fuel farm and discover it just had a fuel delivery, you'll have to play a waiting game. How long is up to a variety of factors, including the size of the tank, as well as the amount and type of contaminants.

If it is a relatively clean tank with a working floating suction, you're looking at about a two-hour wait. But all bets are off as to how long everything will take to settle if the tank is in any other condition.

Keep you brain in the game…be safe out there!

Continued: The Ruggles Orientator

By Chuck Fisher

(Continued from page 6)

sponses timed and measured. Candidates who did not respond "normally" were screened out. Spatial Orientation had, for the first time, been connected with aviation safety. Dr. Jones, was then tasked to travel around the nation and set up physical exam stations nationwide. He would contact the local medical society and set up a city-wide meeting in which he would recruit volunteer staff, then he would spend 2 days training the staff on physical exam techniques.

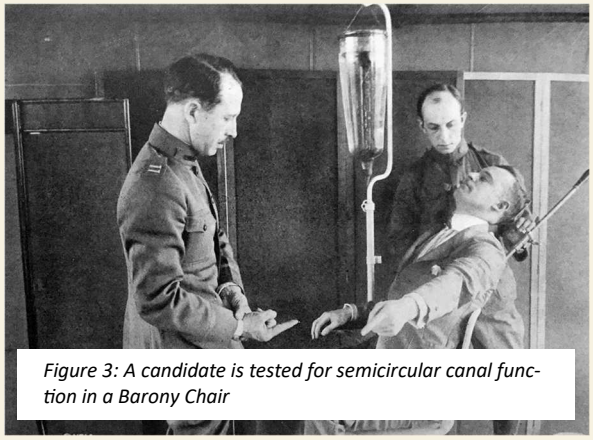


Figure 3: A candidate is tested for semicircular canal function in a Barony Chair

As a one-man team, he travelled coast to coast establishing more than 60 stations that evaluated more than 10,000 pilot candidates within weeks of the US entry into the war. Remember, this was a century ago when travel was by train, early motor car or horse, and there was definitely no online training option!

Through and after WWI there was considerable research into the physiology of aviation and what did, in fact, seem to make pilots more effective and many of the standards developed in the early days of WWI went on to be codified in Paris as the first set of international aviation standards, with Isaac Jones MD as a signatory.

Figure 4 In this screenshot from WINGS...the doctor will see you now.

So what of the spinning whirling device in ***Wings***? It is called a Ruggles Disorientator. It as a three axis fully gimbled chair in which the pilot could be whirled or spun in any axis and that responded to his stick control inputs. Although similar to today's flight simulators, this device was designed to allow pilots to "recover" from unusual attitudes quickly, and to "exercise" their inner ears to recover quickly.

A century ago, the only flight instruments likely to be found in a cockpit were an altimeter and compass and sometimes a slip indicator, so for orientation the pilot was reliant on his senses. Thus, pilots were taught to recover their attitude by "the seat of their pants" using devices like the Ruggles.

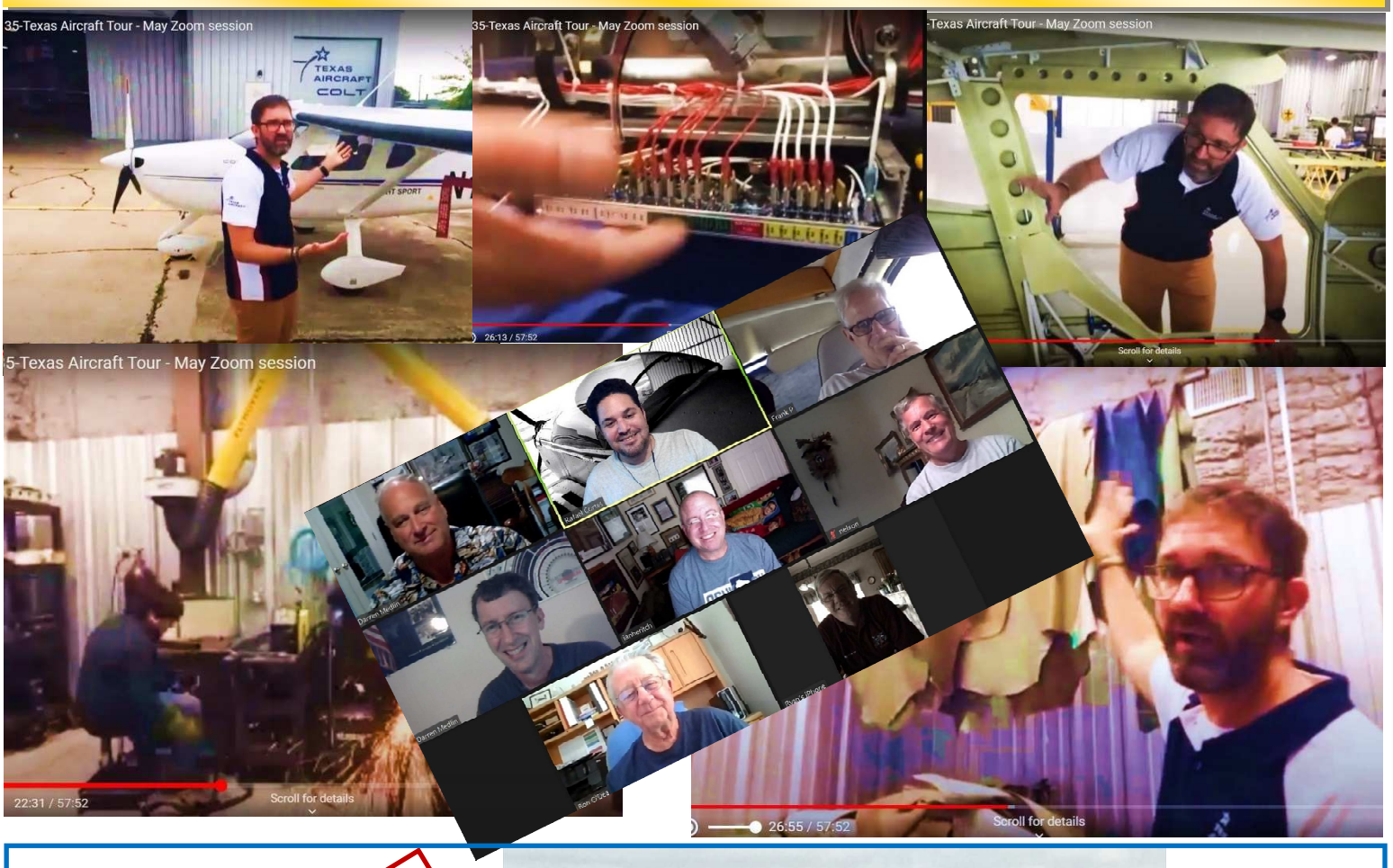
Within a few years, though, aviation medicine physicians and physiologist would develop flight instruments and pioneers like Jimmy Doolittle went on to demonstrate that instruments were more reliable and safer than trusting the human balance apparatus, and training shifted 180 degrees to discourage "seat of the pants" orientation. This pioneering research and the initial development of "blind flight" techniques, and eventually simulators (like the link simulator) were in large part developed at Brooks Field, in those same San Antonio hangars as in the film, by William 'Ocker MD, Carl Crane and others.

Figure 5 A Ruggles Disorientator in front of one of the hangars at Brooks

The link trainer used almost the same gimbled motion device controlled by a stick as the Ruggles' had, but now the purpose was to train pilots to use their instruments *instead* of their ears to recover.

Much of what we know of the human body in air and space was learned, researched and published here in San Antonio at Brooks Fields, so I think the brief images of the disorientator at Brooks a century ago are significant in our history, and a reminder of how much we learned of aviation and the human in only a few short years. The pioneering work of Dr. Isaac Jones led to much of what we still teach today as the mechanism of human orientation. Yet, because of his linkage to and emphasis on orientation testing and re-training; now considered archaic, much of his importance has been lost to history. ***Wings*** serves as a great window by which to see hour aviation heritage. And that....is your aviation trivia for this month!

—SEE MORE AT https://www.facebook.com/eaa35/ AND ON E-VERSION PAGE 22



CONGRATULATIONS!

Congratulations Jason Cammack on a successful maiden flight (and now several more) of his beautiful RV-7A. He shared his construction experience with us only a couple months ago. She's a beauty!

MAY MYSTERY PLANE REVEALED

DOUG APSEY

Congratulations to Charlie Brame who correctly identified our May mystery airplane as the Boeing Model 247.

The Boeing Model 247 was considered the first modern commercial airliner incorporating many new features for an aircraft of that era. This included all metal semi-monocoque construction, a cantilevered wing and retractable landing gear. Other features that made it stand out from the other commercial carrier aircraft of that time included an autopilot and de-icing boots on the wing and tail section. Boeing also added air conditioning and soundproofing to the cabin to increase passenger comfort and incorporated a galley and toilet in the aft fuselage. The early Model 247's had a forward swept windscreen that was intended to eliminate glare from the lighted instrument panel but it was soon discovered that ground lights reflected off the windscreen during night landings so it was changed to an aft swept windscreen when the Model 247D was introduced.

Museum of Flight's Model 247 (Pinterest)

The prototype Model 247 first flew on 8 February 1933 and delivery began in May of that year. The 247 was powered by twin 9 cylinder Pratt and Whitney R-1340 Wasp engines that produced 500 hp each. The 247 was the first commercial twin engine airliner capable of climbing and maintaining an altitude of 11,500 feet at gross weight on one engine. It carried 273 gallons of fuel giving it a range of 745 miles. The Model 247 was faster than any large commercial carrier built in the early 1930's with a cruise speed of 189 mph. This was faster than the military's premier fighter aircraft at that time, the Boeing P-12. Although it required as many as seven stops to fly from Los Angeles to New York, it could make the trip in about eight hours less than the Ford Tri-motor and Curtiss Condor that many airline companies were using at that time. Originally designed to carry fourteen passengers and a crew of three (pilot, co-pilot and flight attendant), the final production version carried only ten passengers in two rows of five seats separated by a center aisle. This turned out to be a major disadvantage of the design since carrying that few passengers did not make it a viable commercial carrier for the major airlines by the mid-1930's. Air carriers preferred the Douglas DC-2 and later the DC-3, both of which carried more passengers.

Museum of Flight's Model 247 (Pinterest)

A total of seventy-five Boeing Model 247's were built. During WWII, twenty-seven of the commercial Model 247's were brought into service by the U.S. military as transport and training aircraft. These carried the military designation C-73. Several Model 247's were still flying in the late 1960's as cargo haulers and personal business aircraft. Today there are four examples remaining and all are in museums, one in Canada, one in the UK and two in the US. Only one of these is considered airworthy and it is currently owned by the Museum of Flight in Washington.

One Model 247 operated by United Air Lines has the dubious honor of being the first proven case of sabotage of a commercial airliner. On October 10th, 1933, the aircraft was en route to Chicago from Cleveland when a bomb exploded on board as it flew over Chesterton, Indiana. All seven on board perished.

Sources for this article include:

https://en.wikipedia.org/wiki/Boeing_247

http://www.aviation-history.com/boeing/247.html

https://www.boeing.com/history/products/model-247-c-73.page

NAME THE PLANE

DOUG APSEY

We have not had an experimental mystery airplane in awhile so I thought it was time for one. Here is your June mystery airplane. Who will be the first to email me at dapsey@satx.rr.com with the following information about this month's mystery airplane? Hint: The designer initially built a two seat version of this airplane that was inspired by a commercially built airplane.

1. What is its name?
2. Who designed and built the first one.
3. What year did it first fly?
4. Approximately how many have been built?
5. What is the name of the two seat version that this designer initially built?

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"Midnight Matinees" at 11:00pm. Advance tickets required.

CLASSIFIED ADVERTISMENTS

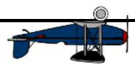
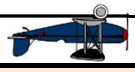
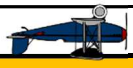
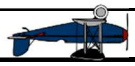
For Sale: Stratus GPS/ADS=B in receiver. This is a stratus 1, works fine and interfaces with Foreflight and most other software. Includes suction cup mount and dashboard pad $200 OBO. I don't need them, so make an offer. Chuck Fisher cfisher555@aol.com

Mike Smith had an unfortunate injury last September. He is building an RV-10. He has completed the tail kit. As a result of his injury he is not going to complete the project and the tail kit is for sale. Link: https://www.barnstormers.com/classified-1568594-Vans-RV10-Tail-Kit.html?catid=23352

To post a classified—contact the editor at eaa35news@gmail.com

- *You must be an EAA Chapter 35 member.*
- *Ads are FREE and will run for 3 Months from the last date you re-verify that the item is still for sale.*
- *PLEASE Notify me when your item sells!!*
- ***You must contact the editor by e-mail or phone to extend your ad beyond the expiration date***

CHAPTER CALENDAR — CONTACT EAA35VP@GMAIL.COM - *PROGRAMS ARE TENTATIVE AND SUBJECT TO CHANGE!*

JUNE	***13***	**11:30 ANNUAL CHAPTER 35 MEMBERS PICNIC**
	19	**6:00 pm VMC Club**
	20	Optional Activity (Fly-Out/Rally) TBA 
JULY 	***11***	**9:00 FLY-IN BREAKFAST (Chef, Prep Cooks, Servers always Needed)**
		Board of Directors Meeting to follow
	17	??? TBA
AUGUST	***8***	**11:30 LUNCH; Program: Casey Fox – Reincarnating a Warbird (T-6)**
	14	**6:00 pm VMC Club; 7:30 pm Movie**
	15	Optional Activity (Fly-Out/Rally) TBA 
SEPTEMBER	***12***	**11:30 LUNCH; Program TBA**
	18	**6:00 pm VMC Club; 7:30 pm Movie**
	19	Optional Activity (Fly-Out/Rally) TBA 
OCTOBER 	***8-11***	**B-17 Aluminum Overcast Media Day 8th, Ride/Ours 9-11. Volunteers needed!!!**
		Board of Directors Meeting to follow
	16	**6:00 pm VMC Club; 7:30 pm Movie**
	17	Optional Activity (Fly-Out/Rally) TBA 
NOVEMBER	***14***	**11:30 Annual Membership Meeting and Election of Officers**
	20	**6:00 pm VMC Club; 7:30 pm Movie**
DECEMBER	***12***	***CHRISTMAS PARTY*** **11:00 Social Hour; 12:00 Lunch** **Gift Exchange to follow** (*~$15 target for gifts but that's up to you! See newsletter for more details)*
	18	**6:00 pm VMC Club; 7:30 pm Movie**

UPCOMING EVENTS

Aviation Calendar of Events websites

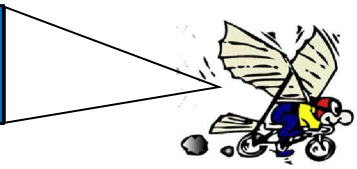
Aero Vents http://AeroVents.com
EAA http://www.eaa.org/calendar
Fly-ins http://www.flyins.com
Fun Places http://funplacestofly.com
Social Flight http://socialflight.com
Council of Air Shows https://www.airshows.aero/Page/ASCalendar
Milavia http://milavia.net

EAA Facebook Page: https://www.facebook.com/pg/eaa35

FREE ONLINE CLASS: and Get a free introduction flight in a Pipistrel Aircraft: To register and begin learning about Pipistrel aircraft and flying in general, please register for your online course at https://www.pipistrel-online.com/
Click "Create new account", follow the registration instructions and select the online course you are interested in by using the Enrolment key: FlyPipistrel

Our local distributor Dave White will honor the free flight is from Boerne Stage (5C1) His Phone # is 830-388-0120

EAA Chapter 35 Leadership



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(210) 875-9971	*president@eaa35.org*	*210-878-5561*	*vicepresident@eaa35.org*
Secretary:	Paul Wurster	**Treasurer:**	Dee Brame
503-933-8264	*secretary@eaa35.org*	*210-493-5512*	*DeeB@satx.rr.com*

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Past Presidents		**At Large**	
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Kris Kelly, Director		Brian Goode	
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Andrea McGilvray, Director		Jane Kellogg	
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Nick Leonard		*Lew Mason*	
		210-688-9072	*lewnan@sbcglobal.net*

Country Store

By RICHARD VINAS

We have plenty of the WashWaxAll products to help beautify and clean your airplane while you are staying within the social distancing guidelines! Call me at (210) 912-1699 if you need a home delivery of any products, shirts, or any merchandise from the Country Store (no tipping the driver, please!). With a good chance that I will see you all in June, we may have some golf/polo shirts with the Chapter 35 logo for inspection and for sale. Many of the vendors that were closed have reopened and are glad to have a chance to conduct some business. I am again open for suggestions, especially for merchandise for the big B-17 flight at Stinson in October. Finally, as always, we have lots of keychains, mugs, koozies, and stickers for those who are running out of gifts for friends. Maybe we can get together again soon!

Rick Vinas

These "Scrubbers" are great for de-bugging the leading edges of your wings.

TEXAS FLAG POLO SHIRTS	Sold Out - Can be ordered	$39.00
TEXAS FLAG FISHING SHIRT	One Medium- Men's	$46.00
YELLOW POLO SHIRTS	One Small	$31.00
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YELLOW FISHING SHIRT	ONE Small Men's	$40.00
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	ONE LARGE	
TEXAS FLAG APRONS	3 left	$26.00
Additional Items available		
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CHAPTER 35 DUFFLE BAGS	Only 2 left	$31.00
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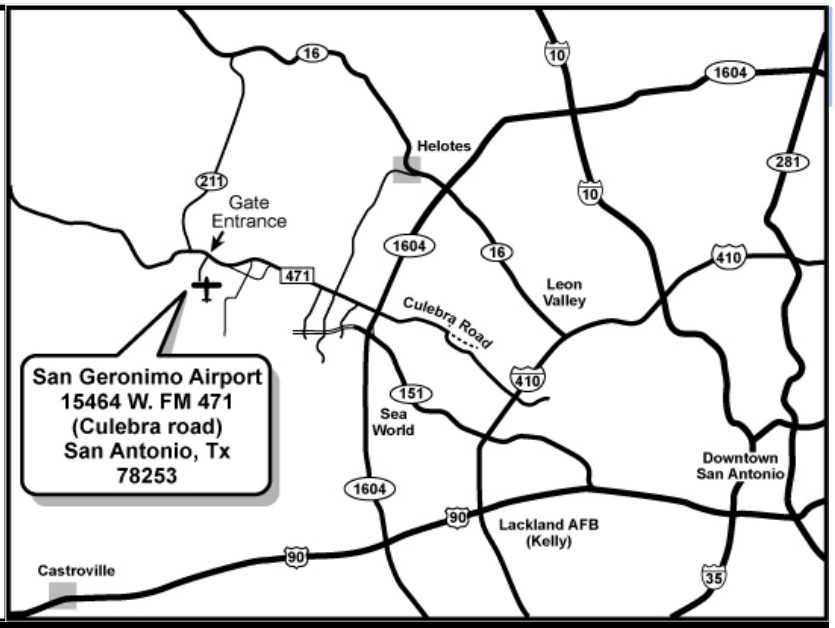
REMOVE BEFORE FLIGHT KEY TAGS	Plenty	$5.00
KOOZIES	Plenty	$4.00
BUMBER STICKERS, DECALS AND PATCHES	Lots of them	$1.00 - $3.00
ALUMINUM WHEEL CHOCKS	3 Double sets	$40.00
WASH WAX PRODUCTS	Limited supply	$8.00 & up

Chapter 35 meets Each Second Saturday of the Month



EAA Chapter 35 is part of the worldwide network of EAA chapters. EAA embodies the spirit of aviation through the world's most engaged community of aviation enthusiasts. EAA's 170,000 plus members enjoy the fun and camaraderie of sharing their passion for flying, building and restoring recreational aircraft. Our clubhouse and building facilities are located at San Geronimo Airpark (8T8) located off FM 471 (Culebra Rd) West of San Antonio.

For 60 years Chapter 35 has represented aviators of creativity who share a passion for flying. Come join us!

Click Here for Link to 8T8 on AirNav.com

Ron O'Dea, Membership Chairman
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All purpose Degreaser/ wax that you can safely use for those tough, greasy, oily cleaning jobs such as, aircraft engine and exhaust areas, landing gear, car wheels and tires, boat transom and water line. Removes dirt and black streaks without scratching.
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The quickest and easiest way to clean the dirtiest aircraft bellies, engine areas, and landing gear. Safely removes grease, oil, hydraulic fluid, and exhaust soot without scratching the surface.
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Spray On - Wipe Dry

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Waterless Wash Wax Mop - Faster, Easier, Safer. NEW
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All you need to clean, restore and protect leather and vinyl in one kit.

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All purpose citrus solvent. Removes tar, oil, hydraulic fluid, adhesives, and gum. A safe, effective, alternative to toxic chemicals that is safe to use on paint, plastic, glass, bare metal, carpet, and seats.

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Safely and gently cleans leather and vinyl. Removes dirt, grime, body oils, and lotions.

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