



FLYING BEYOND IMAGINATION

April 2018

Volume 60 Issue 4

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James F. Humphries, Jr Colonel USAF (ret.)

This is my own favorite personal flying story. It happened while I was a student test pilot at the USAF **Aerospace Research Pilot School** at Edwards Air Force Base, California, in 1966. The fancy school name was in response to a new addition to the curriculum to include basic astronaut training for U.S. students completing the test pilot phase of what was formerly the USAF Experimental Flight Test Pilot



Jim and NF-104

School. The change made sense because NASA was choosing its astronauts from operational test pilots who were graduates of either the Air Force or Navy test pilot schools, and in most cases had graduate engineering education.

Test pilots were thought to have the "Right Stuff" to pilot or operate new and experimental space craft. That proved to be the case. As the services began to inaugurate military space programs of their own, it was natural to find a way to train their own astronauts. The Air Force Manned Orbiting Laboratory is a good example. It would be a military "spy-in-the-sky" program, not associated with NASA. With a new mission thrust upon it, the Air Force responded with the new curriculum for aerospace research pilots - the test pilots of the space age.

In 1965, after graduating from the University of

Michigan with graduate degrees in aeronautical and astronautical engineering, specializing in the guidance and control of space vehicles, I applied for test pilot training. About the same time, I also applied for the Manned Orbiting Laboratory program as an astronaut candidate. I was accepted for the school, and also became one of twenty-five finalists for the MOL program. Both selections sent me to Edwards AFB for test pilot and basic astronaut training.

When the test pilot phase was completed, I entered the aerospace portion for training in space flight. The most exciting flying was a training mission patterned after the exotic zoom profiles that the experimental X-15 rocket planes were flying through the atmosphere and into "space." The School was quick to follow with training test pilot students in the Mach 2, F-104 jet fighter, which led to a zoom flight that included phases of the X-15 missions. As my class of eleven pilots approached this phase of training, we checked out in the F-104. It was popularly called the "**missile with a man in it**," and pushed the envelope of all of our class pilots from Mach 1, the speed of sound, all the way to Mach 2.



F-104, plane of choice for "zoom flights"

(Continued on page 4)

Next Event

April 14

Breakfast Fly-in

0900-1200

Chapter 35

Clubhouse

Runway 35 is published monthly as a free service for our members and our flying community by

EAA chapter 35.

Publisher:

Editor: Chuck Fisher

ea35news@gmail.com

Fly-in Breakfast



See the massive Mike Logan Memorial Grinning Griddle
Saturday 14 April @ 0900hrs

PRESIDENTS COCKPIT

STEVE JONES



Young Eagles Rally. Join us Saturday, April 28th 9:30 AM, at San Geronimo Air Park for our first Young Eagles Rally of 2018. Phil Vaneau will provide the details. Volunteer pilots and ground support people needed to make this a memorable experience for our next generation of aviation enthusiasts, pilots, mechanics and astronauts.

Master Pilot Award. On March 10th, the Federal Aviation Administration, family, honored guests and members of EAA Chapter 35 commemorated a milestone, recognizing Jim Humphries' first fifty years of safe, rewarding flying; a significant portion of that in the service of his country. Charlie Hamilton of HQ FAA presented Jim with the Wright Brothers Master Pilot Certificate following a stellar presentation highlighting Jim's contributions to our aviation and space programs.

March Meal. *Seventy-four* members and guests gathered to stoke the fires before setting out on our Fifth Annual Hangar Tour. This has traditionally been soup-n-salad and out the door for the tour, with little thought given to the meal. This time was different. Seven volunteers stepped up and presented some of the best soups we've ever experienced. By the end of the meal, it was clear there was as much pride and love put into the soups as we enjoy with our Chili Cookoff. Another six volunteers brought their 'A' game to our desert table. Folks, this was amazing! Thank you, all who contributed your time, talent and recipes to make this a memorable meal.

April Pancake Breakfast Fly-In. Join us Saturday, April 14th at 9:00 AM for fluffy flapjacks. We'll be rolling out our secret weapon, the massive Memorial Mike Logan Grinnin' Griddle to make sure no one leaves hungry. It takes both electricity and propane to run this crew-served monster spinning pancake-producing machine. You have to see it!

Movie Night. Sixteen members gathered Friday March 16th to take in a scintillating tale of triumph over tragedy as John Wayne and the crew of the Corsair, a war-surplus C-47, braved the elements to survive while compatriots gathered from across two nations to mount a search and rescue mission, in "Island in the Sky." A truly amazing story, and great flying! If you're a fan of the Gooney Bird, this movie is for you.

Making a Difference. On March 22nd, Phil and Susan Vaneau represented EAA Chapter 35 at the San Antonio Aviation Hall of Fame Dinner, presenting our Young Eagles program and our Educational Outreach program to movers and shakers within the San Antonio Aviation community. Your board convened electronically to approve Air Academy Candidate Hunter Beaton. Hunter will be attending the first session of Air Academy in July! Meanwhile on Capitol Hill, our representatives shelved the idea of privatizing Air Traffic Control. This has huge implications for general aviation in the United States. How did that happen? Follow me on a journey through the next few paragraphs as we explore.

Soapbox Time! EAA Chapter 35 has been around for 61 years, fulfilling a need for our chapter members to meet, socialize, share knowledge, talent, and tools to build and fly airplanes. It's a passion

we all share. Chapter 35 also exists as a 501(c)(3) organization to benefit our surrounding community. We share our passion with our neighbors as well as young, aspiring men and women who may be searching for a path to their career in aviation. We promote safe flying. We reach out to our local neighborhoods to explain our presence and identify the benefits of a healthy general aviation community. We support our local school districts. We fly Young Eagles. We experiment.

Why EAA? Chapter 35 is awesome, but there are limits to our awesomeness. As a 501(c)(3) non-profit organization there are several things we cannot do: We can't endorse a political candidate who shares our vision. We can't lobby congress to support good legislation, or to point out when a bill is bad. As a chapter with limited resources, we can't preserve aviation history and culture. We can't manage world-class educational opportunities like Air Academy or sponsor the world's largest aviation convention year after year -- at least, not on our own. EAA can.

What has EAA done for us lately? This is a key question. EAA teamed with AOPA to fight ATC Privatization, and won. Stop and think about that for a minute. That could have gone badly for us. EAA lobbied for Pilots Bill of Rights II and partnered with AOPA to advocate airman medical reform. We now have Sport Pilot and BasicMed. EAA championed a sane approach to equipping general aviation aircraft with tools for safe flight. As a result, FAA allows non-TSO'd equipment like clocks and Angle of Attack indicators in certificated aircraft. EAA lobbied again to refine the requirements for ADS-B equipment. Now experimental and certificated aircraft can fly with compliant GPS sources costing \$400, where before they were \$3000 and up. EAA members with certified aircraft can now equip their planes with Dynon EFISs and TruTrack autopilots for a fraction of the cost of TSO'd equivalents.

Are You Involved? Most EAA Chapter 35 members support the organization that supports us with initiatives such as our educational outreach and Young Eagles programs, and advocacy on issues such as ATC Privatization and BasicMed, just to name a few. If you are already a member of EAA, I thank you. If you're not, please consider it. Your membership benefits continue with a subscription to *Sport Aviation*, access to member discount programs and resources that are sure to make your passion for aviation secure, safe and rewarding. You'll join a vibrant world-wide group of aviation enthusiasts whose voices are heard before legislative bodies throughout the world. Pretty cool, and only \$40.00. If your family is 'all in', it's just \$50.00 per year for the whole family! By the way, the member discount programs work! As a member of EAA, I save more than \$50.00 per year on aircraft insurance and supplies.

Get Involved. Your chapter, over 120-strong, needs you. Do you have a skill or experience you want to share? Do you see something that just needs a little of your time to make it right? Jon King did, and his work was featured in last month's EAA Leader Video outreach. Get involved!

Until we meet again, fly safe and have fun doing it.



CHAPTER BULLETIN BOARD

FLY OVER & HANG OUT



Third Annual Hallettsville Fly-In & Pig Roast
April 21, 2018

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www.wherelddogsfly.org

or call Jim at (361)772-6434

Visit our Facebook Page or the [Socialflight](#) app
under Texas Barnstorming Museum

Chapter 35 Pancake Breakfast Fly In



Main Course:
Fluffy Flapjacks
formed on the
massive Memorial
Mike Logan Grin-
nin' Griddle!

Side Dish: Pancakes. Oh, sausage, too.

To Drink: Orange Juice, Coffee, and water

Desserts: Pancakes. (my, they're versatile!)

Shout Out: Thank you to all our volunteers and preparers who supported last month's meal. Who knew soup could be so fun?

Soups

Roxanne and Danny Beavers – Chicken Tortilla Soup
Darren Medlin – Veggie Black Bean Soup
Doug Apsey – Italian Wedding Soup
Georgia McCarley – Chicken Gumbo Soup
Nancy Fox – Olive Garden Secret Recipe Soup
Nancy Mason – Taco Soup
Freda Jones – Beef Vegetable Soup

Desserts

Carmenza Hamilton – Columbian Tres Leche Cake
June Goode – Peach and Cherry Cobbler
Dee Brame – Apple Pie
Georgie Brown – Brownies
Lynn Morgan – Frosted Cookies with Pecans
Peggy Fisher – Cup Cakes

Tour

Peggy Fisher – Meatballs
Maarten Versteeg – Chips and Queso
Jim and Mary Ann Schlattman – Water Stop
Matt Van de Walle – Buttered Popcorn

Servers

Roxanne Beavers
Peggy Fisher
Freda Jones



HUMPHRIES CONTINUED

(Continued from page 1)

After being checked out and becoming proficient in the Starfighter, we were anxious for a turn at zoom flights. This was the point when the things one could do with an airplane suddenly went beyond experience into the unimaginable. We were going to exchange the kinetic energy of Mach 2 flight (some 1,300 miles per hour at high altitude) for the potential energy of over 85,000 feet of altitude. These were "zoom flights," and mine was on the schedule that bright morning. This is how it went.

I arrived on the flight line about 0530, and entered the temporary trailer to get into a full-pressure suit, better known as a "space suit." It was bright orange, a cumbersome



Suited up and ready for my "zoom flight"

affair that included special boots and gloves and a spherical helmet, all of which were interconnected to form a flying suit that could be pressurized to keep the pilot alive and safe from the ground all the way into space. It was not designed to be comfortable, especially when it inflated to provide a pressurized atmosphere of one-hundred percent oxygen within. It was necessary to breathe pure oxygen for an hour before flight to remove nitrogen from the blood. That was called "prebreathing." Nitrogen, comprising 78 percent of the air we breathe begins to come out of solution in the blood at high altitude where ambient pressure is very low. These bubbles of nitrogen find their way into the joints of fingers and the major joints in the body, and are quite painful.

Divers coming up from the depths too quickly experience the same phenomenon, the bends. It is preventable, and pre-breathing

100 percent oxygen, plus the added pressure in the suit, are a workable precaution. When the pre-breathing period was over, it was time to head for the airplane. I climbed the ladder into the F-104, and began to strap-in with considerable help from the ground crew, as the airplane had been modified to accommodate the pressure suit, and the connecting hose from the portable unit was reconnected to the airplane's internal lifesupport system. I ran through the checklist, cracked the throttle, and hit the start switch.

With the engine running at idle, I turned on the avionics switch and contacted the tower for taxi instructions. I was directed to Runway 04, 15,000 feet of concrete with an extension onto the Rogers Dry Lakebed. The flight would be monitored by the Flight Test Engineering radar tracking unit, call sign, Sport. They would track my takeoff and climb-out in the Edwards Restricted Area, and later, give me the command to begin the zoom maneuver as I approached the lake bed at twice the speed of sound.

I took off in full afterburner with an F-104 chase plane on my wing, and climbed toward the east at Mach point nine, just below the sound barrier. As we neared the Colorado River which delineated California from Nevada, I depressurized the cockpit, and felt the pressure suit inflate. I was for the moment, the Michelin Man, in a fully-inflated, near-rigid space suit. But everything was working perfectly. I had reached 45,000 feet, and it was time to turn back to the west and accelerate to Mach 2. I pushed the nose over to start a gradual descent with the lake bed in sight in the distance. The airplane slipped quickly through the sound barrier at Mach 1. The engine began to make its strange, but accustomed, groans and squeals of its own as the speed increased, with the airplane still in full burner. As it reached Mach 1.3, the bypass flaps opened automatically, and the engine rpm was allowed to increase to 103 percent for a little more thrust. The airplane was soon pushing Mach 2, an amazing 1,300 miles per hour, which means tearing through the air at twenty-two miles-a-minute. I leveled off momentarily at 35,000 feet, watching the compressor inlet temperature and Mach meter climb steadily together. I began a gentle

climb to find colder ambient air. The compressor inlet's limiting temperature of 100 degrees Centigrade was creeping up to its red line as the Mach meter crept toward Mach 2, twice the speed of sound. They came together at almost the exact moment that Sport called. "Clear to pull!" This was the moment I had been pressing for. It was time to zoom!

I brought the stick back smoothly and the airplane



F-104, approaching Mach 2, just before zoom.

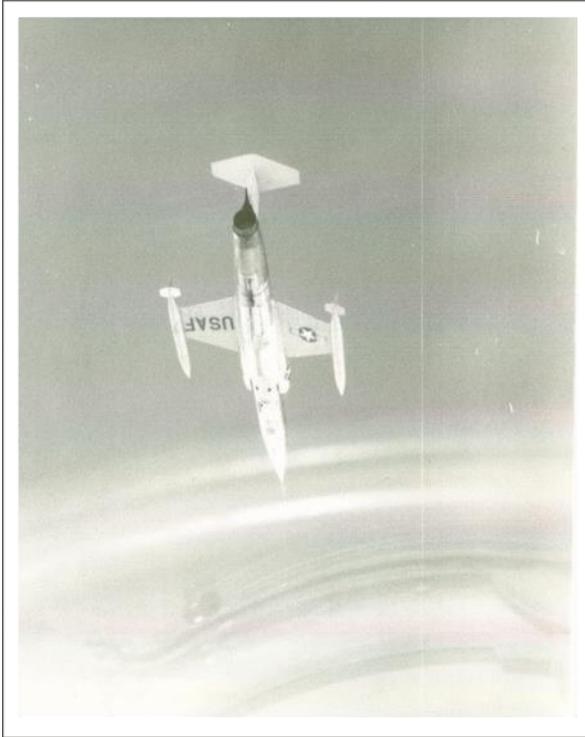
turned skyward, stopping at exactly fifty-five degrees nose-up

(Continued on page 5)

HUMPHRIES CONTINUED

(Continued from page 4)

pitch attitude as displayed on the attitude indicator. From here on up, I would be flying almost exclusively on instruments. And what a sight! The altimeter was winding up at a blur, as the 104 mounted thousands of feet in seconds. With wings level, and the pitch attitude pegged at 55 degrees, we were going up so fast it was unbelievable. I was sticking to the pre-planned profile all the way. At sixty-three thousand feet, I pulled the throttle back, out of after-burner, to keep the engine from over-tempering in the thin air. On we zoomed! At 75,000 feet, the mission card called



F-104, from below, just after arcing on top of zoom.

for engine shut down. Still supersonic, I brought the throttle to idle/cutoff, and felt the sudden deceleration as the engine stopped pushing. Now the airplane was climbing on momentum alone, like an artillery shell approaching its apogee. Going over the top, carefully keeping the angle of attack below the stall was critical. As I began a gentle pushover, the airplane arced-over at 87,000 feet, still supersonic, and at zero g! I had never been so high before. I had never experienced being in an inflated pressure suit. I was aware that without the pressure in that suit, my blood would boil, and I would be dead in seconds. But those were not the thoughts in my mind at the moment.

This was a time to shout in celebration of a once-in-a-lifetime experience.

Savoring the moment, I stole a quick glance outside, and saw a sight I'd never seen before. The sky above me was black. Not pitch-black dark like a shroud, for the sun was shining brightly. But no stars were visible in the glare. Far ahead, the horizon was visibly curved with a white band of haze above. And way out ahead lay the Pacific Ocean with a couple of great cities along the coast. For years, when I

told this story, I claimed that I was seeing, in a single eye-full, San Diego to the south, and San Francisco to the north. I read recently that those two cities were 605 miles apart, so maybe I exaggerated a little! Then in a moment of reality, I realized that I was flamed out seventeen miles straight up! Still supersonic and weightless! Then it was back on the gauges, and down the back side of the great parabola of the zoom profile, still above Mach 1, with my nose pointed at the dry lake bed below. At 55,000 feet, I hit the start switch, and to my relief and delight, that wonderful J-79 engine lit up and began to accelerate. I was in powered flight again, with an X-15-type overhead traffic pattern coming up.

My chase plane spotted me and headed my way as I set-up for the landing approach. I flew over the dry lake bed that morning at ninety degrees to the runway heading for an X-15 approach. I brought the throttle to idle 25,000 feet above the lake bed runway outlined on the dried clay below. I extended the speed brakes and configured the airplane for high drag, simulating that of a flamed-out X-15, and held an airspeed of 300 knots, while making a single 270 turn from high key to final. Before me lay the long lake bed runway, as I let the airplane slow to 265 knots, and dropped the gear. One, two, three green lights came on as I flared to land. Gear was down and locked. I touched down and felt the softness of the dust beneath the wheels. The dust that clung to the landing gear would let my crew chief know for sure that I had landed on the dry lake. Next was to deploy the drag chute to slow for braking. It worked as advertised, and I jettisoned it as the plane slowed to taxi speed. The airplane rolled straight ahead onto the north end of the concrete runway, and I tied back to the chocks and a waiting ground crew. I sat there for a minute before shutdown, savoring what I had just done. It was truly beyond my imagination.

I opened the canopy and shut down the engine. The fuel gauge was close to zero. In a moment, the ground crew were up the ladder to congratulate me, and remind me to put the seat pins back in. The suit had returned to its un-pressurized size and shape. The technicians disconnected the life support hoses, opened my visor and let me breathe the fresh desert air again. After I had unstrapped, they helped me stand up in the seat in that awkward suit, and carefully step over the canopy rail onto the ladder. With my weight on that first leg to touch the ladder, the tension of the flight manifested itself in a noticeable firing of the calf muscle. The same thing happened with the next step, and all the way down. Boy, was I wound-up! The flight had been an adrenalin rush from start to finish. I knew I was soaked in sweat as I walked back to the trailer to get out of the pressure suit. Back in the School building, I logged twenty-two minutes for the entire flight to the Colorado River and back, including the zoom to 87,000 feet! "All in a day's work" doesn't do it justice. Still today, I have almost-total recall of every moment of that extraordinary flight more than fifty years ago. Makes a good flying story, I think!



SAFETY CORNER

RON O'DEA



Minding Weight, Maintaining Balance Improper or Underperformed Calculations Can Be Fatal

Weight and Balance—What should pilots do?

Between 2008 and 2016, the probable causes of 136 general aviation (GA) accidents were related to pilots improperly conducting preflight performance calculations for weight and balance or not conducting them at all. One-third of these accidents resulted in pilot and/or passenger deaths.

If pilots do not perform preflight calculations to verify that their aircraft are within allowable weight and center of gravity (CG) limits, the aircraft could be operated in exceedance of their certificated takeoff gross weight and/or outside CG limits.

Overloading aircraft or operating outside of the CG limits can severely degrade an aircraft's performance characteristics and ultimately lead to an aerodynamic stall and/or loss of aircraft control, typically during takeoff or landing.

Not accounting for atmospheric conditions—such as wind, high temperature, and high-density altitude—on an aircraft's performance can exacerbate the effects of operating outside of weight and CG limits. Even if an aircraft is under or near its maximum gross takeoff limit, atmospheric conditions can degrade the aircraft's performance enough to prevent it from attaining or maintaining a climb.

A flight instructor and student pilot was conducting an instructional flight in an Aeronca 11AC airplane when it impacted trees at the departure end of the runway, resulting in minor injuries to the student. The flight instructor reported that, during the takeoff climb from a grass runway, the "climb rate became stagnant." He added that he instructed the student to "lower the nose slightly," but the airplane still could not establish a "normal climb rate." After taking over the flight controls, the flight instructor turned the airplane toward a small gap in the tree line ahead, and the airplane subsequently impacted the trees. According to the flight instructor, the airplane departed "loaded at gross weight." The student reported that the flight instructor did not discuss the airplane's weight and balance with him before the flight. Post accident weight and balance calculations revealed that the airplane was 139 lbs over its maximum gross weight, and the calculated density altitude was about 2,648 ft. The airplane's overweight condition, in combination with the takeoff in high-density altitude conditions from a turf runway, decreased the airplane's takeoff performance and resulted in the accident. (GAA17CA347)

What can pilots do?

Know your aircraft's limitations and the factors that can affect its performance.

Conduct weight and balance calculations in accordance with the applicable aircraft flight manuals (AFM) to ensure that your aircraft is loaded within its weight and CG limits. The limitations section of each AFM or Pilot's Operating Handbook contains details about the maximum weight and CG limits for takeoff and landing.

Be prepared and conduct takeoff and landing distance calculations as part of your preflight planning. Remember to account for fuel burn during flight, which will result in a CG shift and decrease in weight.

Be aware of the atmospheric conditions that exist at the time throughout your flight and account for these factors in all your performance calculations.

Remember that operating the aircraft above its maximum gross weight can result in a longer takeoff run due to the airplane's slower acceleration and the need for a higher takeoff speed; shallower climb angles and reduced climb rates; reduced cruising speed; shorter range; higher stall speeds; and longer landing rolls.

Be aware that operating an aircraft outside of its CG limits can degrade its handling qualities, resulting in reduced stability and/or reduced control authority, which increases the risk of a loss of control. Be vigilant on every flight.

Determine the CG even if your aircraft is under its maximum gross weight. Even if an aircraft is within its allowable gross weight, it may be loaded outside of its CG limits.

Do not "guesstimate" passenger and cargo weights. The margins of error are small, and even slightly underestimating these weights could kill or seriously injure you, a friend or colleague, or a family member.

When using automated weight and balance application calculators, ensure that the basic empty weight and moment match the specific values for your aircraft. Sample weight and balance data should never be used as a substitute for actual numbers in the AFM.

If any major modifications to your aircraft change its weight or CG, such as the installation of onboard equipment, **ensure** that this information is in the updated weight and balance forms contained in the AFM.

Remember that aircraft performance can only be determined after the gross weight is computed. Professional flight crews do these computations routinely. You should strive for professionalism as well when you are planning your flights.

REMEMBER — Before Every Flight, Ensure That Your Aircraft Can Operate Safely

<https://www.nts.gov/safety/safety-alerts/Documents/SA-072.pdf>



CHAPTER NEWS & FROM MEMBERS

JIM HUMPHRIES GETS WRIGHT BROTHERS MASTER PILOT AWARD

James Humphries, Jr Receives Wright Bros. Master Pilot Award

On 10 Mar 2018, James (Jim) Humphries, Jr, Colonel, USAF (ret) EAA #30169, surrounded by friends, family, honored guests and members of EAA Chapter 35, was presented the Wright Brothers Master Pilot Award by the FAA. Presenting the award on behalf of the FAA was Charlie Hamilton, himself a distinguished pilot. The Wright Brothers Master Pilot award is presented to pilots who have been flying for a minimum of 50 years without having their license revoked or suspended.



Marsha and Jim Humphries w/ Charlie Hamilton

tude of 87,000 feet and a speed of Mach 2.0, with a total elapsed flight time of 22 min. He is a member of the United Flying Octogenarians (UFO), holds private pilot and glider pilot ratings and currently owns a Stolp Starduster Too.



From Left: Jared Humphries, John and Vicki Humphries, Marsha, Jim, Jeanine and Tim Humphries, and Tom Humphries.

Jim has been flying, both military and civilian for more than 50 years and told of his most memorable flight in his military career. It was a "Zoom Flight" in a F-104 Starfighter out of Edwards AFB to an alti-



YOUNG EAGLES

Young Eagles Rally at San Geronimo Airpark

On Saturday, 28 April 18, EAA Chapter 35 will host a Young Eagles Rally at San Geronimo Airpark from 0900 to 1300. We need volunteers for this event, including pilots, static displays, ground instructors, escorts, operations/safety



PHIL VANEAU

people, and admin help (registration, photos, etc.) Please contact Phil Vaneau at pvaneau@gmail.com or 210-887-3135 to volunteer. We need all the help we can get. **As a friendly reminder....**All Young Eagle PILOTS need to complete Youth Protection Training and submit a Background Check. It only takes about 20 minutes. Just sign into your EAA account, select "My Account," then "Go to Training." This needs to be accomplished about 2 weeks prior to flying a Young Eagle. Thank you all for your continued support of this project.



NEW MEMBERS

Pat and Craig Ditsch from Hondo, who built and fly a Lancair IV-P. Craig is a commercial pilot with CFI and instrument ratings. Pat is also a commercial pilot with instrument, multi-engine, glider, and seaplane ratings and is a CFII. They may be reached at their respective emails: craigditsch@gmail.com and patditsch2gmail.com.

Ben and Clarita Parra from Cibolo who fly an Avid Flyer and are restoring an Earthstar Odyssey. They have built several aircraft including

an X-Air, Avid Bandit, and Titan 1. You may reach them at clara-morpar@gmail.com



CHAPTER BUILDER'S

RICHARD POENISCH

Thoughts on Building

All of us in the EAA are experimenters. That being said, we all experiment with different things, some by building aircraft, others by building equipment for our own or others aircraft. That includes engines, electronics, furnishings, or just assembling a kit for any or all of the aforementioned. All of this is great fun and a fascinating challenge for us, the builders as we are constantly having to solve problems we encounter in our builds. Most of us are blessed with spouses that, even though they may not enjoy our "endeavor" as much as we do, support us in a myriad of ways, both financially and emotionally. Even though they may not put a hand to a tool, they are just as much builders as we are. **WE** are their building adventure. They are building on a relationship that started long before we ever decided to pull the trigger and build our dream machine.

Without this support, most of us would never complete our building adventure, as is attested by all of the many machines stored in garages, barns, and hangars across the country. Sometimes their support is more a swift kick in the seat of the pants than a grand buildup of our abilities, but sometimes that is what we need. They are there to keep us on track and moving, as they would like to see us complete our projects because they believe in us and our ability to find a way

around, over, or through any obstacle in our path. Again, sometimes this is a good swift kick in the pants, but usually that is what we need to get us **back** on track. It is SO-O-O easy to get side-tracked into a circular problem! We should take time to thank these people, husbands or wives, sons or daughters, for their dedication to making our dreams succeed in spite of ourselves. Most pilots are male, and next month includes Mother's Day, so take a good look at who is in your life helping you and don't forget to let them know that you appreciate them and ALL that they do to help build **THEIR** dream machine also, even if is not a machine, but a relationship that may span many years. Don't forget, that includes doing what you may not especially enjoy but they do. Turn about is fair play, as they put up with us and our "obsessions" much more that we do theirs.

Good luck, God Bless, and Keep Building!

P.S. A good way to show it is to send in your progress, pics and articles, on your project so we can print it in the newsletter.



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MARCH MEETING- SEE MORE AT <https://www.facebook.com/ea35/>

DARREN MEDLIN

Thanks For A Wonderful Tour!

This is a big thankyou note to all of you who opened up your hangars for our annual open house in March. In case you missed it Bryan Nelson gave the group a great overview of woodworking and his upcoming Pietenpol project inside our Chapter hangar, then Allen Moore, Paco's son, showed off two of his Dad's classic gyro's. Next was a visit to part of the Fisher Warbird Collection with Peggy Fisher serving meatballs and little smokies and giving a great presentation on the Navion and photos from Oshkosh. Right next door James and Mary Ann Schlattman hosted a cold water station and answered questions about their sleek Sport Cruiser and light sport aviation. Just across the taxiway Dave Baker "the Artist" hosted a wonderful collection of his paintings and Lew Mason added water-color pieces to the display inside the, now available for rent, Anderson hangar, courtesy of Cheryl Vollmer. Thanks to Chuck and Peggy Fisher's batcave cut-through we ogled the Navion again as we cut through the hangars and over the taxiway to

visit Maarten Versteeg and Monica Early for an update on the Zenair 640. Flash, the friendly wonder dog (my addition) greeted us and the chips and queso flowed (or crunched) as Maarten explained his "wooden engine" attached to the project. Just down the taxiway Casey Fox showed off his beautiful Hatz Biplane. We learned the history of the design, the group that built it and special flying qualities of this elegant craft. Rounding the corner we entered Matt Van De Walle's hangar where Fred McMahon updated the group on the impending FAA airworthiness inspection on his RV-8. After that Matt Van De Walle educated us on details of his Stinson and where all the technical data is found for that historic design. Between handfuls of popcorn we quizzed him on the hardware used on the plane. Then it was back to the club house for dessert. The many stops showed us a wide range of flying machines, builders, maintainers, artists and friends and family, both two legged and four. These kinds of experiences are only possible because of your gracious hospitality in opening up your hangars for our visits. Thank you all very much and I can't wait for next year.



MARCH MEETING- SEE MORE AT <https://www.facebook.com/ea35/>

PHOTOS BY DAVID BAKER AND RICHARD POENISCH



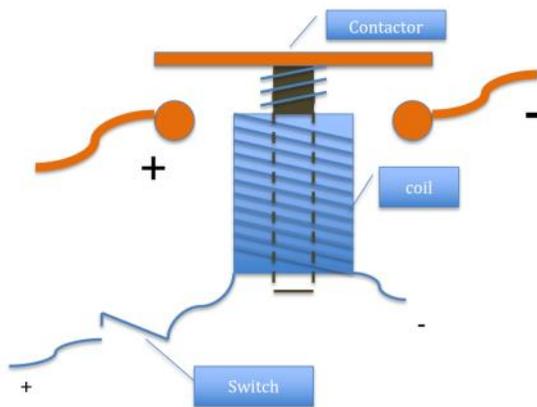
THE BUILDER'S CORNER

Flyback Diode?

Mark Julicher

If your aircraft has an electrical system, then undoubtedly it has a master solenoid. As discussed in previous articles, a solenoid is an electromagnet combined with a switch. The solenoid is set up such that a small amount of power can control a large amount of power. In figure 1, a small amount of power is depicted by the small + and - signs and the larger amount of power is depicted by the larger + and -.

Figure 1: Schematic of a Solenoid



Imagine then, that the switch in figure 1 is your master switch and the coil and contactor assembly is the master solenoid. You can see that the contactor is normally held open by a spring, but when a small amount of power is applied from the switch, the electromagnet is energized and closes the contactor.

The starter solenoid, the external power solenoid and perhaps several other solenoids all operate in similar fashion. Once again, the objective is to use small power to control large power. If this were not the case then your instrument panel would be populated with large switches and huge wires.



Photo 1: Master Solenoid

The take away from photo 1 is that you can see the large contacts on the left and right and also

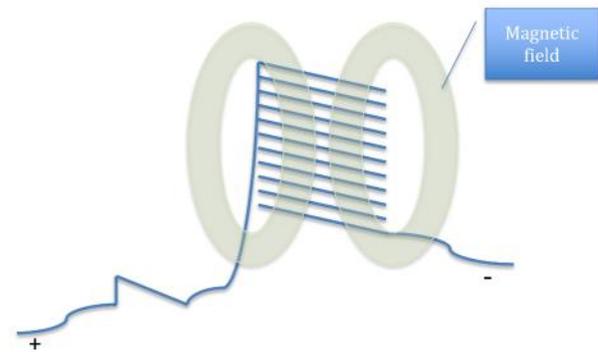
the smaller contact where the master switch should be connected. In this instance, the solenoid case is ground for the coil.

When you close the master switch, the coil is energized and the contactor closes. But what happens when you open the master switch? Well, the coil de-energizes and the contactor opens, but also a big spark jumps across the switch causing little burns and pits and eventually destroying the switch. It should be obvious by now that this article is to explain why the spark happens and how to prevent it.

So why the spark?

Figure 2: An energized coil

When the coil is energized a magnetic field is formed along the axis of the coil. It is an electromagnet. All inductors (coils) exhibit this behavior. As long as current is flowing, the magnetic field is there. When current stops flowing the magnetic field collapses and returns its energy back to the coil very suddenly. Of course there are all sorts of math to quantify this energy and all sorts of laws named after deceased physicists to describe the phenomenon. What you need to know is that there is a large amount of energy looking for somewhere to go and that somewhere is going to be an arc across your switch unless you do something to



prevent it.

Ah! So after much beating around the bush we come to the crux of the matter. Some method is needed to direct this energy to a safe place and not burn up the switch. The preferred method is to install a fly back diode.

A diode is a one-way check valve for electricity. Photo 2 shows a

(Continued on page 13)

THE BUILDER'S CORNER (CONTINUED)

(Continued from page 12)

diode typically used for aircraft solenoids.

In a diode, current flows in the direction the arrow points, or in other words from right to left in both the photo and the schematic diagram.



Photo 2: Diode, part number 1N5401

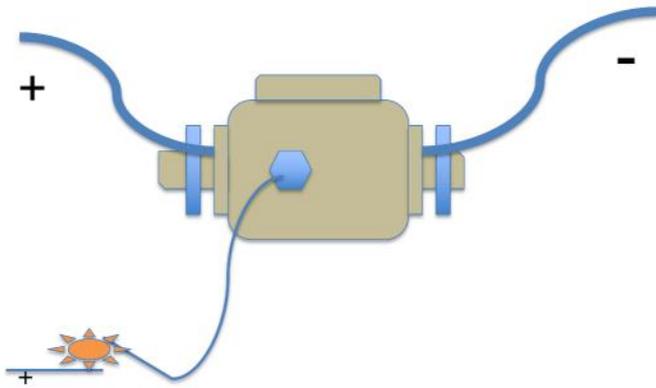
Armed with this information, let's apply it to our switch arcing problem.



Figure 3: Schematic symbol for a diode.

Figure 4: Opening the master switch without diode protection.

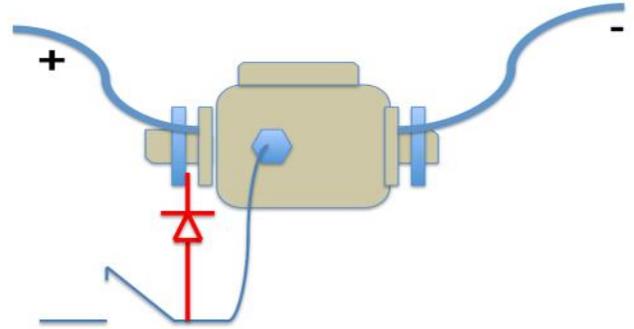
In figure 4, the aircraft battery is supplying power to the large contact on the left and the large contact on the right is connected to the electrical buss. As the master switch is opened the electrical energy from the collapsing magnetic field causes a voltage spike and a spark across the switch. In figure 5, as the master switch is opened the electrical energy



from the collapsing magnetic field has a path through the diode back into the positive lead from the battery and is dissipated. The battery absorbs a voltage spike and the switch does not arc.

Notice that since the diode allows only one-way flow, the battery is not applying power to the small contactor. Electricity can only flow from the small contact

Figure 5: Opening the master switch with diode protection



We find many planes that just never had a diode or sometimes we find burned remnants of a worn out diode. Once or twice a year we discover a burned out switch that could have been prevented with a fly back diode. Go check your plane! A diode is cheap but a master switch is expensive. If you need a diode, drop by Hangar 64... we have a stash of new diodes.



Photo 3: Diode properly oriented on a solenoid.



MARCH MYSTERY PLANE REVEALED

Doug Apsey

Charlie Brame sent me the answer soon after the newsletter arrived in his inbox. So once again, congratulations to Charlie for identifying our mystery airplane as the Seversky P-35. The P-35 was designed by Alexander Seversky and Alexander Karveli

(who also designed the P-47 Thunderbolt) and built by the Seversky Aircraft Company. It first flew on August 15th, 1935 and delivery to the US Army Air Corp began in May of 1937. A total of 196 were built including those that were exported to other Air Forces.

The P-35 was the first all metal, retractable landing gear, enclosed cockpit aircraft used by the USAAC. It was selected by the USAAC during a fly-off between the Curtiss Model 75, the Vaught V-141, and the Consolidated PB-2A. The USAAC ordered 77 P-35's of which 76 were delivered by the end of the contract in August of 1938. The 77th airframe was modified by Seversky and became the prototype for the XP-41 which was never put into production. In 1939, Seversky Aircraft Company became Republic Aviation Company.

The P-35 was powered by an 850 hp Pratt and Whitney R-1830-9 Twin Wasp radial engine that gave the airplane a top speed of about 290 mph, well short of the 300 mph goal Seversky was hoping to get out of the design. Normal cruise speed was 260 mph and the rate of climb was 1920 ft/min. Empty weight was 4575 lbs and maximum takeoff weight was 6723 lbs. Range was 950 miles. Armament initially consisted of one M1919 Browning 30 caliber machine guns and one Browning AN/M2 50 caliber machine guns for the P-35 while a later version, the P-35A, carried two of each. It could also carry up to 350 lbs of bombs.

In June of 1939, the Swedish Air Force placed an order for 15 P-35's followed by a second order for 45 aircraft in October of 1939 and finally a third order for 60 aircraft in January of 1940. These were designated the EP-106 by Seversky and the J-9 by the Swedish Air Force. These were powered by the 1050 hp Pratt and Whitney R-1830-45 engine. The last order was not delivered to Sweden due to an embargo against shipping weapons to other countries so the 60 EP-106's built for Sweden ended up with the USAAC and were designated P-35A's. The majority of these were sent to the Philippines and eventually transferred to the Philippine Air Force. A two seat fighter bomber version of the P-35 designated the 2PA was also produced. Sweden also had ordered 52 of the two seat version but received only 2 before the embargo halted the shipment. The remaining 50 were used by the USAAC as advanced trainers and re-designated as the AT-12 Guardsman. Two of the two seat 2PA's were sold to Russia in 1937 along with the rights to build the aircraft but it appears none were ever manufactured there. Seversky also secretly sold twenty 2PA's to Japan and it became the only US built aircraft to be used by the Japanese against the US in WWII.

The P-35 saw action in the Pacific but was totally inade-



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quate in performance and armament against the superior Japanese aircraft. The P-35 was considered obsolete even before the US entered WWII and by early 1942, the majority of the P-35's had been replaced or destroyed. The Swedish Air Force continued to fly their J-9's until September of 1952.

Although the P-35 was never considered much of a fighter aircraft and was obsolete by the time it was really put into service during WWII, the design led to the development of the Republic XP-41 and XP-43 which were the forerunners of the P-47, one of the most successful fighters of WWII.

Four examples of the P-35 remain in museums today. One at the National Museum of the United States Air Force in Dayton, Ohio, one is owned by Kermit Weeks and on display at his Fantasy of Flight Museum in Polk City, Florida, one (an AT-12) at the Planes of Fame Air Museum in Chino, California and one at the Swedish Air Force Museum located at Malmen Airbase.



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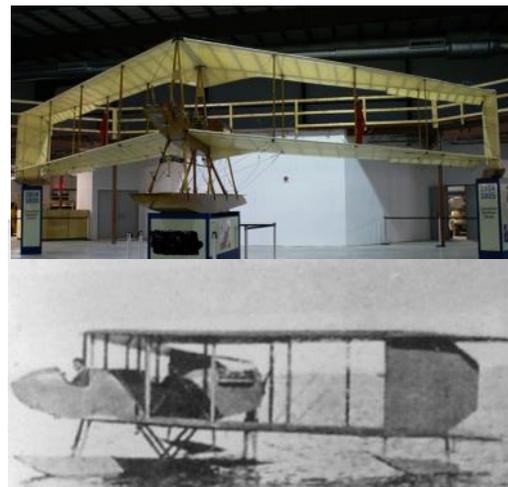


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NAME THE PLANE

Our newsletter editor thought I was being too easy on you so he suggested this unique aircraft as your April Mystery Airplane. You'll have to look way back into the early days of aviation to find this one. Who will be the first to email me at dapsey@satx.rr.com with the following information about this month's mystery airplane?

1. Who designed and built it?
2. What is its designation/name? i.e. C-172 Skyhawk, PA-24 Comanche, etc.?
3. What year did it first fly?
4. How many were built?





Country Store

BRIAN GOODE

NEW ITEMS IN THE STORE

We have found a Duffle Bag that will do double duty. You can use it as an airline carry-on bag that will fit in the overhead compartment, or as a carry-on bag that will fit in your aircraft's luggage compartment..

It also has a feature that will let you



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the big bag.

We ordered some and they were all sold at the March meeting, so we will have some more at the April meeting. We have them priced way below the mail order bags at \$30.00, which includes tax, title and transportation.

SHIRT NEWS

We received some new Shirt orders at the January and February meetings for sizes not in inventory. They are now available

at the country Store.



We presented a new item at the March meeting, it is the white Fishing Shirt with the **Texas State Flag** on the back. It was a great success as we took orders for 18 of them. They are only available in men's sizes, so the ladies can order a size smaller than a regular lady's size that fits them now. If you normally buy a lady's medium, the you should order a small size.

BTW, they are also available with long sleeves, with a little button-down strap to hold them rolled up,

if you choose to roll 'em.

The new TEXAS shirt appears to be just another white shirt from the front.



All prices include State Sales Tax

For merchandise please call Brian @ 727-709-1159, or email: ladybgoode@msn.com

All of the proceeds from the sale of EAA Chapter 35 Country Store merchandise goes towards supporting the activities of the Chapter, so buy some stuff. Today.

COFFEE MUGS	CH. 35 logo	\$7.00
Fishing Shirts	Short sleeves	Men's & Lady's
	Long Sleeves	\$39.00
		\$43.00
TEXAS shirts are the same prices as above		
POLO shirts with Ch. 35 Logo	SM – XL	\$30.00
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Baseball Caps	Ch 35 Logo	\$10.00
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Chapter 35 Bumper Stickers		\$1.00
Wheel Chocks – Aluminum	Two sets	\$40.00
"Wash Wax All" Products	Under retail	



CHAPTER CALENDAR — CONTACT EAA35VP@GMAIL.COM - PROGRAMS ARE TENTATIVE AND SUBJECT

APRIL 	14	FLY-IN BREAKFAST EVENT <u>Chef, Prep Cooks, Servers Needed</u> BOD Meeting	EAA Chapter 35 Clubhouse 9:00 - 12:00 am 12:30 am
APRIL 	28	EAA CHAPTER 35 YOUNG EAGLES RALLY	EAA Chapter 35 Clubhouse Registration 0930-1200
MAY	12	SPRING CLEANING! Yard/Chapter Building Work Party	EAA Chapter 35 Clubhouse 10:00 am – 12:00 pm Lunch Served at Noon
JUNE	9	ANNUAL CHAPTER 35 PICNIC <u>Chef, Prep Cooks, Servers Needed</u>	EAA Chapter 35 Clubhouse 11:30 am to?
JULY 	14	FLY-IN BREAKFAST EVENT <u>Chef, Prep Cooks, Servers Needed</u> BOD Meeting	EAA Chapter 35 Clubhouse 9:00-12:00 am 12:30 am
AUGUST	11	LUNCH MEETING	EAA Chapter 35 Clubhouse Lunch 11:30 am Meeting/Program 12:30 pm
SEPTEMBER	8	LUNCH MEETING	EAA Chapter 35 Clubhouse Lunch 11:30 am Meeting/Program 12:30 pm
OCTOBER 	13	FLY-IN BREAKFAST EVENT <u>Chef, Prep Cooks, Servers Needed</u> BOD Meeting	EAA Chapter 35 Clubhouse 9:00 - 12:00 am 12:30 am
NOVEMBER 	10	ANNUAL CHILI COOKOFF EAA Chapter 35 Fly-mart Annual Membership Meeting and Election of Officers Lunch and Chili Judging	EAA Chapter 35 Clubhouse 10:00 – 11:30 am 11:30 am Immediately following the meeting
DECEMBER 	8	CHRISTMAS PARTY Christmas gathering 11-12 Lunch catered Gift Exchange ~\$15 target for gifts but that's up to you!	EAA Chapter 35 Clubhouse Social Hour 11:00 pm Lunch Served Noon-1:00 pm Gift Exchange 1:30 to 3:00 pm

Upcoming Local/Texas Events and Airshows

Aviation Calendar of Events websites

Aero Vents	http://AeroVents.com	21-22 Apr	American Heroes Airshow Camp Mabry, Austin, TX
EAA	http://www.eaa.org/calendar		
Fly-ins	http://www.flyins.com		
Fun Places	http://funplacestofly.com	28-29 Apr	T-6 Texan Roundup Gillespie Co. Airport, Fredricksburg, TX
Social Flight	http://socialflight.com		
Council of Air Shows	https://www.airshows.aero/Page/ASCalendar		
07-08 Apr	The Heart of Texas Airshow TSTC Waco Airport, Waco, TX	04-06 May	Central Texas Airshow Draughton-Miller AFB, Temple, TX
14-15 Apr	CAF Houston Wing Open House West Houston Airport, Houston, TX	12-13 May	Laughlin AFB Open House and Airshow Laughlin AFB, Del Rio, TX

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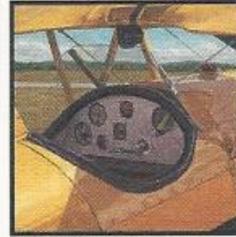


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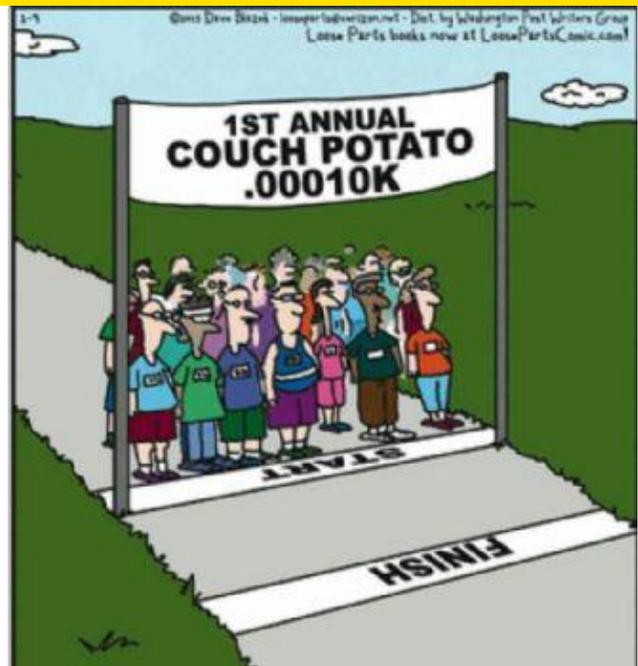
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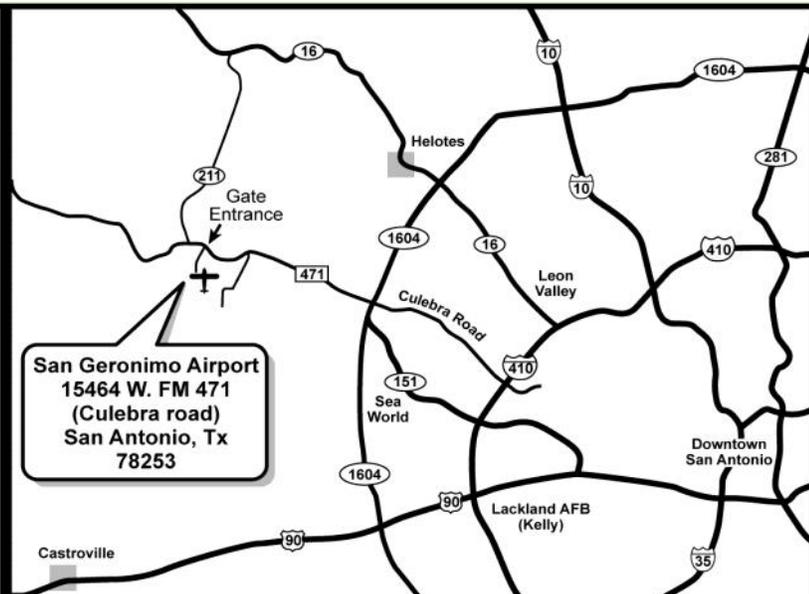
Chapter 35 meets
Each Second Saturday of the Month

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0900-1200

April Fly-in Breakfast

Chapter 35 Clubhouse



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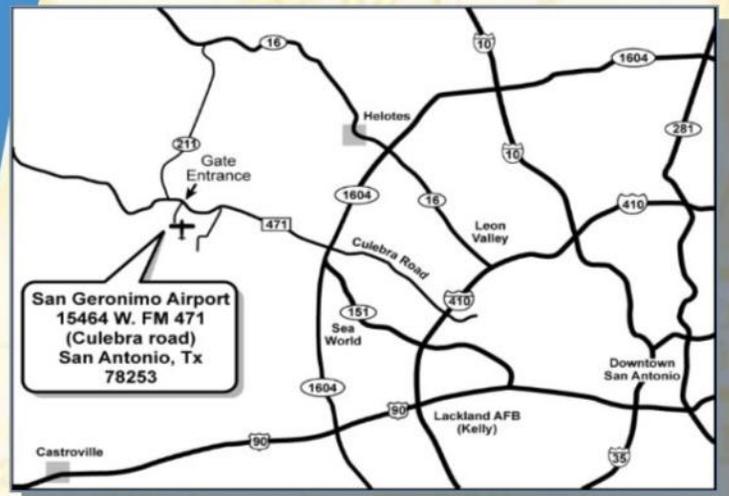
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