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November 13th

- Program: Nelson Amen, Solar / Alternate Energy for Your Hangar
- Chili Cookoff @ 5:30





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CORROSION TALK

By RB "Doc" Hecker

EAA Technical Counselor #5453

Metal Corrosion

10

One of the most important inspections we can do on our aircraft is to look for signs of metal corrosion. Metal corrosion contamination in our aircraft may take place internally or on surface structures. Corrosive deterioration of the original metal may change surface smoothness, weaken the underlying structure, or damage or loosen adjacent parts. The main source of corrosion in aircraft is related to water or salt containing water vapor in the atmosphere that combines with oxygen in an electrolytic process. Obviously, aircraft operated in or around fresh or salt water environments (e.g. seaplanes) are at high risk for corrosion. Not so well appreciated is that aircraft operated within proximity to a seacoast are also at risk for salt water vapor contamination. Chemical agents can also initiate corrosion by directly attacking the metal if improperly applied or removed, as in the case of oil, grease or exhaust residues, caustic chemical cleaners, battery acids, or left-over flux agents after structural welding or brazing. Frequent aircraft cleaning allows for removal of corrosion prone agents, and has the secondary benefit of allowing visual inspection of the metal structures to identify potential problems.

There are two general classifications of corrosion that include the specific forms that will be discussed here. These classifications are: Chemical attack and electrochemical attack. In all types of corrosion, the underlying metal is physically converted to a metallic compound such as an oxide, hydroxide or sulfate. Aluminum and magnesium alloys present with surface pitting and etching, usually with a grey or white powdery deposit. Copper

and copper alloys leave a greenish or bluish deposit, while with steel or iron containing metals, reddish (ferrous oxide) or black (ferric oxide) deposits are noted. The process of corrosion always causes two simultaneous changes that are chemically known as oxidation-reduction reactions. Electrolytically, the oxidized attacked metal undergoes anodic change, and the corrosive agent is chemically reduced while undergoing cathodic change.

Some attempt is made by the manufacturer to provide some corrosion resistance to metal structures. These forms include cadmium plating of steel fasteners, where the cadmium coating is sacrificial, and pure aluminum cladding of aluminum alloy (Alclad) which is employed to minimize corrosion capability. Also, chemical alodining of aluminum alloys and chemical magnedining of magnesium alloys, along with treatment of steel components by etching and priming followed by quality paint or other protective coatings are typically used on primary and secondary structures to preserve and to protect metal surfaces.

Types of Corrosion

There are many forms of corrosion that are dependent on various factors such as the metal involved, the metal's size and shape, its specific function, the atmospheric condition it resides in, and which corrosion-producing agents are present. Interestingly, thicker metal sections are more corrosion prone than thinner sections due to the change in physical characteristics after machining. The following are the more common forms of corrosion found in aircraft structures:

Surface corrosion

Surface corrosion typically appears as general roughening of the surface with

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CORROSION TALK (CONTINUED)

(Continued from Page 1)

area of corrosion is beneath the surface coating, the first clue may be the lifting of surface plating or paint in small blisters (this is not paint failure!) due to the underlying pressure of the accumulating corrosion deposits. Due to the multi-linear, spider web type pattern of surface deformity, this is sometimes known as filiform corrosion. Magnesium and aluminum structures noted to have paint deformities should be immediately inspected for underlying corrosion.

Dissimilar Metal Corrosion

In the presence of an electrolyte, dissimilar metals in contact with each other may initiate an electrochemical (galvanic) action that causes severe pitting and destruction. Typically this galvanic reaction is hidden from surface view and is found by disassembly and inspection. A dissimilar metal chart typically found in aircraft mechanic handbooks should be consulted to guide you regarding conflicting metal contact. Direct attachment of aluminum to steel surfaces will begin dissimilar metal corrosion unless protective measures are undertaken to adequately prepare the mating surfaces. These measures can include electroplating, metal spraying, chemical treatments, or special wrappings.

Intergranular Corrosion

Intergranular corrosion is an insidious problem caused by an attack along metal grain boundaries, and is commonly a result of lack of uniformity of the metal grain in the alloy structure. Aluminum alloys and some stainless steels are prone to this form of corrosion. Very severe intergranular corrosion may cause the surface metal to exfoliate due to pressure of corrosion products within the grain boundaries that leads to delaminating of the surface metal or causing the metal to flake off.

Stress corrosion

Stress corrosion occurs due to the combined effects of sustained tensile stresses in a corrosive environment. Although stress cracking occurs in any metal system, it is especially found in aluminum, copper, stainless steels and high-strength (> 240,000 psi) alloy steels. This corrosion may be either transgranular or intergranular in nature, and usually follows cold working stress points. Areas of concern include aluminum alloy bell-cranks with pressed-in bushings, landing gear shock struts with coarse (pipe) thread grease fittings, shrink fittings and overstressed B-nut fittings. Inspection of the radius of bends in cold worked metals should be included in your corrosion check.

Fretting Corrosion

Fretting corrosion may be particularly damaging when two surfaces normally mated together begin to undergo motion relative to each other. The mated surfaces accumulate fine debris which causes further abrasion. The debris particles typically cannot escape the abrasive environment, and in the presence of water vapor, the destructive process is accelerated. Deep grooving resembling brinell marks can be identified, or pressure indentations may be noted. The so-called "smoking rivet" indicates rivet loosening with the "smoke" consisting of a metal debris trail. This smoke trail signals inadequate metal-to-metal fixation with potential underlying corrosion that should be investigated within a short (25 hour or less service time) maintenance period. Smoking rivets should always be replaced

Corrosion Limits

Corrosion, no matter how slight, is physical damage to metal. As in other damage, corrosion damage is classified under four standard types: (1) Negligible damage, (2) damage that is repairable by patching, (3) damage repaired by insertion of new materials, and (4) damage that requires part replacement. The term "negligible" does not imply that no action is necessary – the corroded surface needs to be cleaned, treated and coated (e.g., painted) as appropriate. Negligible damage is defined as a change of a metal surface that is scarred, or has had the protective coating eaten away and the metal has noticeably begun to etch.

Inspection

Cleaning an aircraft, and keeping it clean, is very important as the main way to detect evidence of metal corrosion is by doing a visual inspection. Any change in the usual color of a metal, or a change in a coating or paint finish, signals that a problem with metal corrosion may be occurring. Depending on the aircraft, there may be recurring problems noted with a particular make and model that lead you to do more frequent inspections. Examples of these types are sea planes, which by their nature are around moisture containing environments, conventional gear aircraft in which moisture collects in the tail section, and Cessna 200 series aircraft with foam core elevators and trim tabs. Hard to reach structures may require mirror inspection or the use of the newly available flexible fiber scopes. Mechanical methods such as a "coin tap" to detect a change in the "ringing" of the metal (dull report or thud), or the use of a sharp device (awl) can be helpful in detecting a change of integrity of a metal's soundness. Non-destructive testing measures such as dye penetration methods can be employed if hidden corrosion or metal damage is suspected. (Continued on Page 6)

PRESIDENT'S COCKPIT

By Dave Baker

Can you believe how fast this "flight" has gone this year? Here it is already November and we are starting our decent to the end of this year. I have really been blessed to have the people who hold the offices of your Chapter be so supportive towards the success of the monthly meetings and the other events we have had this year. There will be more on this next month.

Did you hear how great the Young Eagles rally was on October 16th? Brad and his "crew" flew 59 kids in just about 60 minutes. Brad had nine pilots and planes show up and five of these were 4 seaters, so you can see how we were able to get all of the kids flown (and most of the sponsors as well!) in a short period of time. Every kid I saw had smiles on their faces after their flights and some were wanting a second flight too!! Great day for our Chapter. The pilot were: Brad Doppelt, Ron Paduh, Ron O'Dea, Jim Feighny, Danny Beavers, Brian Goode, Ira Wagner, Steve Moliterno, Doug Jenkins and Doug Aspey. Ground support memeber were: Jodi Doppelt, Dennis Scheidt, Ed Seurer, Steve & Freda Jones, Roxanne Beavers, Jamie Pacheco and yours truly. The children (and adults) were treated to snacks and drinks supplied and served by Gail Scheidt. A BIG THANK YOU to all of you who made thia a special day for so many young folks.

Now, all of you procrastinators!! We are getting down to the wire for our Christmas Party which will be held at the clubhouse on Saturday, December 11th starting at 5:30pm and food served at 6:00pm. The meal will be Ribeye Steaks, green beans, scalloped potatoes, salad, tea, coffe and water. We must give the caterer a head count by the november meeting date (Nov. 13th) so if you have not made your reservation, PLEASE do so by then. Call me (210-410-9235) or Gail Scheidt (210-688-3210) and let us know

how many you are bringing so we can add it to our count. As of now (Oct. 25th) we have 40 people confirmed and we only have room for about 70 at the most, so get your name(s) in now PLEASE. Also, we will start accepting payments from those who have already signed up at the November meeting (\$25.00 per person). Also, as you all remember we have our "White Elephant" gift exchange at the Christmas party and I want to remind you that the gifts should be of a value of \$10 or less and can be just about anything (keep it clean !!) as we have a lot of fun during this event and it is an excellent way to end the evening and Year!!

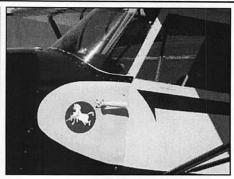
OK folks, we will be transitioning to our final approach on this flight this year pretty soon so sit back, relax and enjoy the scenery and the ride!!!





CHAMP RESTORATION PICS















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MORTALITY IN ARMY AVIATION - 1914

In this multi-part series, Ron Paduh presents a unique view into the then-new endeavor of heavier-than-air flight. From the earliest days comes a sobering analysis of flight accidents, their causes, and their unfortunate results. This historical perspective reveals that while much more is known today about weather, materials, aerodynamics, and human factors, we continue to make the same mistakes.

This is article 6 of 12, to be published each month covering the first 11 fatal aircraft accidents in the Army 1908 – 1914. Each month will be a different accident and the last month will be a general discussion of all 11 accidents. This information comes from a copy of an original letter from the Signal Corps to the Chief of Staff.

Accident No. 6:

Extract from Proceedings of Board of Officers held at San Diego, Cal., May 10, 1913:

No person actually witnessed the accident. From the testimony and evidence obtainable the Board reached the following decision:

Lieut. Park left the aviation field at North Island approximately 5:20 o'clock A.M., May 9, 1913, with the intention of flying to Ascot Park near Los Angeles. His object in an early start was to avoid strong winds which might arise later in the day. At 8:30 in the morning a telephone message was received stating that Lieutenant Park had been killed at Olive, California.

The members of the board and medical officer, Captain W.A. Reasoner, at once proceeded to the scene of the accident in an automobile arriving there about 1:00 o'clock P.M.

The wreck of the machine and the remains of Lieutenant Park had been removed to Santa Ana, Cal., by direction of the County Coroner, the wreckage being taken to the National Guard Armory, and the body to the undertakers. The wrecked machine was examined by the Board and the body identified by the President of the Board before proceeding to an examination of the scene of the accident.

Lieut. Park had landed on a knoll, the area of the top of which, was such that it gave him about a run of three hundred feet before he came to the slope which was about twenty degrees. At the bottom of the slope is a ridge or embankment. Beyond the ridge is the small valley or ravine, which is covered with trees. On the opposite side is another equally steep slope to the top of another small hill, beyond which is a flat open valley of about four or five square miles in area. The high barley so retarded the speed of the machine that it did not rise before reaching the descending slope.

It ran down this slope until it reached the ridge, and striking this undoubtedly bounded into the air. About fifty feet beyond the ridge is a tree or sapling. The machine struck the tree about five feet from the ground at the left end of the engine section. The force of the blow tore away the entire left side of the machine.

It swung around to the right of the tree, landed at a distance of about one hundred feet on the right rear wheel. This broke the right panels and caused the machine to turn completely over to the left, as the entire left side of the machine was gone. From the position of the radiator, it had evidently fallen on Lieut. Park's head and due to the weight of the engine behind, had crushed it into the ground. The machine had apparently never left the ground until it reached the small ridge above mentioned and then only for a distance of about fifty feet.

Nothing but a perfect landing in the small difficult area could have avoided an accident in alighting.

The Board is of the opinion that the accident was due entirely to poor judgment of Lieut. Park in attempting to rise from such a place.

The Knoll was of such a small area and surrounded by such obstacles that it would have been impossible for any machine to have arisen from it. The accident was in no way due to the fault of the machine which was in perfect running condition.

The following features connected with the accident remain inexplicable to the Board:

- 1. Why Lieut. Park did not choose any of the large flat fields in the vicinity in which to land.
- 2. Why, after landing, he attempted to leave in the direction he did when a glance around him would have shown him its very apparent danger.
- 3. Why he disregarded instructions received prior to his start to communicate personally with the Commanding Officer in case he landed before reaching his destination.

The two senior members of the board are of the opinion that had the accident occurred to a standard hydro-aeroplane, both pilot and passenger might have been thrown clear of the wreckage and escaped serious injury.

CORROSION TALK (CONTINUED)

(Continued from Page 2)

These advanced inspection methods are best left to use under the supervision of a qualified airframe mechanic.

Removal

Corrosion removal is necessary to preserve the metal structure. The removal of corrosion requires that the surface covering over the area of corrosion must also be removed. Cleaning of the affected area to expose all of the area of suspected damage is necessary as extensive corrosion on any panel surface may necessitate treating the entire panel. The following five steps are essential during the removal process: (1) Cleaning and stripping of the corroded area, (2) removing as much of the corrosion products as practicable, (3) neutralizing any residual materials remaining in pits and crevices, (4) restoring protective surface films, and (5) applying the temporary or permanent coatings or paint finishes.

Treatment

The treatment of corroded surfaces is based upon the type of metal that is being attacked. An aircraft mechanic's manual should be consulted prior to treatment of ferrous metals, anodized surfaces, magnesium and titanium alloys, stressed steel components, and aircraft structures and surfaces with specialized coatings (e.g. Parco lubrizing). For the treatment of unpainted aluminum surfaces, a typical aluminum corrosion treatment sequence is as follows:

Cleaning:

Remove oil and surface dirt with a mild cleaner using a stiff fiber brush prior to abrasive cleaning. Do not use steel or ferrous containing bristles when cleaning aluminum surfaces as these bristles will leave dissimilar metal residue on the cleaned aluminum surface.

Polishing:

Hand metal polish with a fine abrasive or quality metal polish. If a surface is particularly difficult to clean, a metal cleaner and brightening compound for aluminum can be used to accelerate the process in order to obtain a clean, bright finish.

Corrosion Inhibition Treatment:

Treat any area with surface corrosion with an inhibitive material such as alodine or one of the commercially available products. The treated area should be wiped down with a clean cloth.

Over coating / Waxing:

Treated unpainted aluminum areas should be finish pro-

tected with a coating of a quality water-proof wax.

Additional Notes for Aluminum Surfaces that will Ultimately be Painted:

Aluminum surfaces that are to be subsequently painted can be exposed to a more severe cleaning procedure that includes the application of a solutions of phosphoric acid (etching) and chromic acid (alodining) prior to the restoration of paint coatings.

Corrosion inhibitors

Trademarked products such as LPS-3, ACF-50 and Corrosion-X are marketed as corrosion inhibitors for all refined metals. These products penetrate joints, rivets, seams, and hinges and chemically neutralize the corrosion prone environment by immediately removing moisture. All of these agents are touted to have the capability to remove saltwater, but they will not loosen any rivets or secured joints. These compounds are safe on metals, plastics, paints, and seals, and can be used to treat your metal surfaces in all types of environments. All of these products are clean and free of toxic and greasy residues. Additionally, only one treatment will neutralize (not remove) ongoing corrosion and continue to protecting your affected structures for up to two years.

Typical Examples of Aluminum Corrosion on a Control Surface Exposed to Salt Air follow.

Figures Demonstrating Visible Corrosion

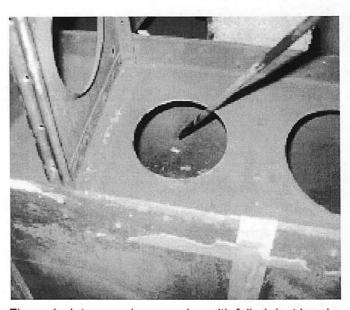


Figure 1 - Intergranular corrosion with failed rivet head beneath paper masking tape. This rivet head was easily removed with a finger nail!

CHILI COOKOFF COMING UP

By Jim Feighny

Heads Up Chili Cooks.

November is our annual chili cook off and this year we will add some extra incentives for all you Food Network fans. So get started on your favorite recipes and have some fun with this event.

Categories of Chili:

Traditional: Meat, seasoning and gravy. No beans, pasta, chips or other fillers of any kind.

Fusion: Meats, seasoning, gravy and beans, pastas, add-ons allowed.

Vegetarian: If you have to ask...

How much to make?

Leave them wanting more: About the amount in a standard crock pot, sauce pan, etc. We will poll for the number of participants as we get close to the date, and will have a back up plan for about 50 guests.

Judging:

A select panel of Judges, headed up by a Genuine Texan (Mr. 7 Generations, Joe K) will determine the Grand Champion.

A vote of the meeting attendees will determine the Peoples Choice Champion.

Criteria: Traditional Category is as follows: Think ACRTA when testing your recipe.

- 1. AROMA Chili should smell appetizing.
- CONSISTENCY Chili should be a smooth combination of meat and gravy.
- RED COLOR Chili should look appetizing.
- 4. TASTE Chili should taste good.
- 5. AFTERTASTE Chili should leave a pleasant taste after swallowing.

Prizes:

Grand Champion: 10 Gal 100LL (Complements of Hondo Airport Manager Tim Fousse).

Peoples Choice: Ride to T-82 in Stinson 108-3.

CORROSION TALK (CONCLUSION)

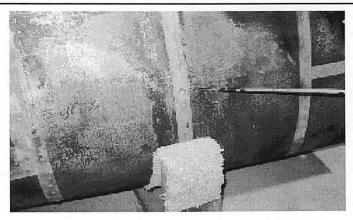


Figure 2 - Surface corrosion with pitting

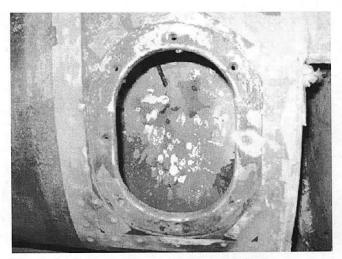


Figure 3 - Surface corrosion with exfoliation.

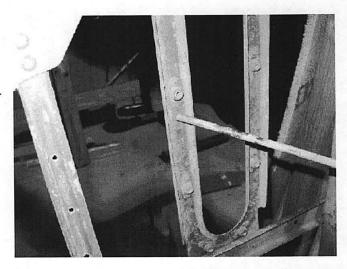


Figure 4 - Surface corrosion around pushrod control cutout. Note deteriorated fiber locknut plates and improper drilling of rib flanges for fabric support by pop-rivets instead of rib stitching.

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CHAPTER CALENDAR					
June 12	Annual Picnic / Fly-in	San Geronimo	11:00am to 2:00pm		
	Hamburgers / Hotdogs				
June 19	Young Eagles Flying	San Geronimo	9:00am		
	Pilots and volunteers needed				
July 10	Program: Lew Mason "Thoughts on a	Dinner @ 5:30 Meeting @ 6:30			
17	Captain Bill's Aero Event				
24 –					
Aug 1	Air Adventure at OSH				
Aug 14	Program: Mike Jordan FAASTEAM Program Manager		Dinner @ 5:30 Meeting @ 6:30		
Sept 11	Program: Norris Warner Presents the Bush Caddy		Dinner @ 5:30 Meeting @ 6:30		
	Captain Bill's Aero Event				
18	Young Eagles Flying		9:00 AM		
	Pilots & Volunteers Needed				
Oct 9	Program: J Braun, "L-19 Down on Gla		Dinner @ 5:30 Meeting @ 6:30		
Nov 13	Program: Nelson Amen, Solar End		esign and Installation Chili @ 5:30 Meeting @ 6:30		

EVENTS CALENDAR

Event Name	Location	Distance
Fayette Regional Air Center	LaGrange, TX	114 Miles
Lackland AFB Airshow	Lackland AFB, TX	18 Miles
Old Kingsbury Aerodrome	Kingsbury, TX	60 Miles
Larry Hagerman Memorial Fly-In	Taylor, TX	111 Miles
	Fayette Regional Air Center Lackland AFB Airshow Old Kingsbury Aerodrome	Fayette Regional Air Center LaGrange, TX Lackland AFB Airshow Lackland AFB, TX Old Kingsbury Aerodrome Kingsbury, TX

Aviation Calendar of Events web sites

Aero Vents http://AeroVents.com

EAA http://www.eaa.org/calendar

Fly-in calendar http://www.flyincalendar.com

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This newsletter is also available online and in color. Please visit the following URL:

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WANTED AND FOR SALE

Instructor Available. Chapter member Bob Cabe has recertified his CFI & CFII. Available to EAAers for BFR's. (210) 493-7223.

For Aircraft Hangar Rentals at San Geronimo Airpark, please call Dan Cerna (210) 688-9345, Dave Baker (210) 410-9235 or Dennis Scheidt (210) 688-3210

FOR SALE: Fun Flying RANS S18 Stinger II



Award Winner, Rotax 912UL, 80 hp, NEW, 54 hrs/tach, \$27,000 firm, Jim Havens, (210)680-7882 home, (210) 347-2455 CP

FOR RENT: EAA Chapter 35 Hangar Space. Rent a 10' x 20' space & get free use of hangar Equipment & tooling. Please call John Kuhfahl (210) 365-0120

FOR SALE: Thundergull 2000. Single seat,



20ft aluminum wing, composite fuselage, Rotax 503 oil injected with 360 hrs TTAF, 3 blade

Warp drive prop, ten gallon fuel tank, aluminum Hagar wheels. Basic instrumentation / EIS, ASI, ALT, COMPASS, ICOM radio, 150ft or less take off/ landing, cruise is 90 mph, stall full flaps 35mph, excellent visibility and handles like a fighter for only \$14,000. Contact John Behrendt at jbehrendt82@aol.com or call (210) 643-1417

FOR SALE:1998 RV 6A, 260 TTA&E (since rebuilt on engine), Lyc 0320 (150hp), Sensenich Fixed Prop, sliding canopy, Nav / Com w/ VOR,

2 GPS units, dual headsets,18 gal, 6gph @ 150mph. Flies regularly. Hangared at 8T8-\$ 45K. Dale Shaw (210) 826-4395



FOR SALE: Breezy 1/4 Fractional Ownership. Contact John Latour at 830 612.-2232

FOR SALE:1946 Aeronca Champ 7AC Conv



LIGHT SPORT! N82621 \$27,000. AF:7AC Conv TTAF: 4,438 Eng: Cont C85-12F, TTE 1,795 TSMOH 496 Prop: McCauley 1B90/CM7 144. TTP 332 TSPOH

126, 2-place intercom, Auto fuel STC, electric starter and battery) 12.5 fuel main tank, 5 gal aux fuel wing tank, Just completed extensive annual by Brad Doppelt. Contact Ron O'Dea (210) 488-5088







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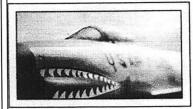
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Annual Inspections: No Sign Off

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Phone H: 210-673-2693 C:210-859-4369





CP: (210) 391-1072 Fax: (830) 980-8866 Email: tcflyingdoc@yahoo.com 29890 Bulverde Lane P.O. Box 279, Hangar 38 Bulverde, TX 78163



All surface non-stick cleaner
Leaves a non-stick protective coaling on every thing you clean
Aircraft, Auto, Marine, RV



Wash Wax All

Hgr 64E - San Geronomo Airpark (210)-710-6063

email: joe@killough.us



Runway 35

OFFICIAL NEWSLETTER OF EAA CHAPTER 35 - SAN ANTONIO, TEXAS

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Ron O'Dea, Membership Chairman 15464 FM 471 W., #14 San Antonio, TX 78253

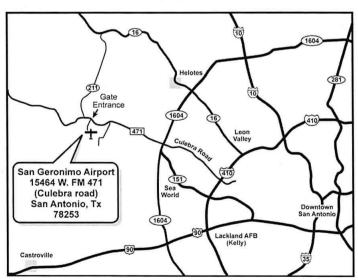
The Official Newsletter of EAA Chapter 35, San Antonio, TX

RUNWAY 35

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Please support those businesses that support YOUR local EAA chapter. Thanks!



When Do You Meet?

Second Saturday of the Month

November 13th

- Program: Nelson Amen, Solar / Alternate Energy for Your Hangar
- Chili Cookoff @ 5:30
- Meeting @ 6:30

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