experimental aircraft association

THE LEADING EDGE

NEWSLETTER OF MUROC EAA CHAPTER 1000

Voted to Top Ten Newsletters, 1997, 1998 McKillop Award Competition

President	*Gary Aldrich*	*661-609-0942*
Vice-President	*George Gennuso*	*661-265-0333*
Secretary	*Kent Troxel*	*661-947-2647*
Treasurer	*Doug Dodson*	*661-256-7276*
Newsletter Editor	*Russ Erb*	*661-256-3806*

http://www.eaa1000.av.org *September 2006*

Chapter 1000 meets monthly on the third Tuesday of the month in the USAF Test Pilot School Scobee Auditorium, Edwards AFB, CA at 1700 or 5:00 PM, whichever you prefer. Any changes of meeting venue will be announced in the newsletter. Offer void where prohibited. Your mileage may vary. Open to military and civilian alike.

This Month's Meeting:

Classic Aviation TV

Tuesday, 19 September 2006
1700 hrs (5:00 PM Civilian Time)
USAF Test Pilot School Auditorium
Edwards AFB, CA

(*cue ominous music...*) You're traveling through another dimension, a dimension not only of sight and sound but of mind. A journey into a wondrous land whose boundaries are that of imagination. That's the signpost up ahead – your next stop, the USAF Test Pilot School....

The scene fades and pans to **Russ Erb** pulling up to the **VC-180** in his '05 Mustang. The **Kommandant** and our special host, ***PPO* Mike Machat**, are exiting the plane and sliding into the Mustang. **Russ** guns it and they roar off to the east, slipping seamlessly onto the long straight highway leading to Edwards.

As we watch this unsuspecting threesome, something unusual begins to happen. No one in the car seems to be aware that anything is happening as they all gaze out the front windshield, each seemingly deep in thought as the cool fall air rustles through the car. At first glance it's the clothing that has changed. Our boys are now sporting fedora hats. Gradually, as we watch, the fedoras are followed by double breasted suits with pleated pants, a nice gabardine. Suspenders and a loud silk tie, **Machat's** tie has a well endowed nude lady painted on it. I can't see but I'm sure that they are sporting heavy wingtips too. The aggressive good looks of the Mustang have blurred and it seems to be taking on the look of a classic 1950's automobile. Hard to make out what kind, no, wait, yeah, the front is becoming very pointed. Oh yeah, the grill is unmistakable, it's a 1951 Studebaker, I believe it's the Starlight Convertible. Yup, based on the mellow exhaust note that's got to be the big six cylinder flathead sporting

the three on the tree with overdrive. If I didn't know that **Russ** was driving I'd swear that **Lee Erb** was at the wheel. Right behind **Russ** sits **Mike**, held close to his chest is a dark brown leather valise. There are a couple of strips of gaffers tape across the front and scrawled on the first strip of tape in grease pencil are the words "Advanced Preview, TV". The second strip of tape says "Steve Canyon, Whirly Birds". What on earth could **Mike** be holding in that valise?

It seems that in the short trip from the VC-180 to Edwards we have slipped back in time, all the way back to the fifty's, when television was in its infancy and the half hour serial shows were the rage. Step back in time with us this evening, watch and listen as **Mike Machat** shows us some rare footage of the TV shows we all watched as kids.

As you know from Mike's previous movie nights, his knowledge of the behind the scenes action and people involved adds another dimension to the shows. So sit back, relax and prepare for a unique evening. And as always, after the fun we'll all go over the BK lounge for some sumptuous eating and solving of the worlds problems. Don't forget your pens and napkins—let's see if we can write all of those solutions down this time.

- George "Knife" Gennuso
Vice Kommandant

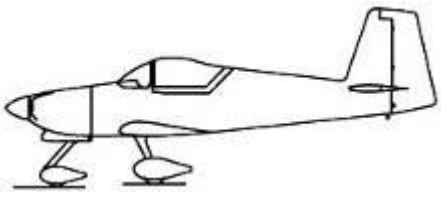
Attack of the Dreaded Yellow Tailed Gnat Snapper

Frosty Wyatt took to the skies, Tuesday 29 August 2006 at 0632 for the first flight of his RV 9A. Kent and I were there as ground crew and to witness the historic event. The flight lasted 1.6 hours and was problem free. His landing was very smooth, so smooth that he decided to go around and shoot 2 more landings before coming in and shutting down. His response to the flight was "It's a dreamboat". No one had the heart to tell him that it was an airplane not a boat.

- George "Knife" Gennuso
Vice Kommandant

Frosty is out early for that final pre-flight preflight

The Dreaded Yellow Tailed Gnat Snapper stands ready. Looks like it may have been snapping at the tail of the KC-97



To fly, insert pilot

Intrepid builder/test pilot ready to go

Engine runs, final checks...

In keeping with *Project Police Picture Pointing Protocol* (*PPPPP*), Vice Kommandant Gennuso points at the spinny thing that should be avoided

"Snapper five niner whiskey taxi to runway 24"

Dreaded Yellow Tailed Gnat Snapper airborne

The DYTGS test team celebrates in an appropriate fashion at Foxy's, then rushes off to work before boss finds out

Last Month's Meeting

EAA Chapter 1000
Clear Channel Stadium
City of Lancaster Sky Box
Lancaster CA
22 August 2006
Gary Aldrich, presiding

The monthly meeting was held at Clear Channel Jethawk Stadium in the City of Lancaster Skybox, which we had exclusive use of thanks to **Mrs. Kommandant Anne Aldrich**. Seventeen members and guests gathered to watch the home team dispatch the visiting Lake Elsinore Storm by a score of 6 to 5, with the Jethawks retaining their tenuous grip on first place.

We were once again plagued by errant foul balls assaulting the skybox, however the fire was ineffective. The last time we visited the ballpark, we sustained a hard line drive, saved only by the thick lexan windows.

The team mascot "Kaboom" visited the skybox, delighting the children amongst us. Personally, I found him to be an odd bird with little of interest to say, so we mugged him, took his wallet and threw him over the rail. There was general agreement that the level of "between innings" entertainment had fallen to a dismal state, and we lamented the absence of our old favorites, Sumo Wrestling and the Frozen T-Shirt contest.

Our thanks to Donna Drucker for the two huge bags of homemade C3's, which is always a treat.

As the Jethawks chalked up the win, the **Kommandant** declared that victory had been achieved over the forces of evil and darkness, or at least against Lake Elsinore. Since we had already stuffed ourselves with cookies and outrageously expensive ballpark concession food, everyone just went home rather than heading out for dinner per our usual custom. Still, we left the stadium secure in the knowledge that America's pastime is alive and well.

- Kent "Cobra" Troxel
Minister of Propaganda

Kommandant's Korner

Geez, September already! I used to complain about AuSepTober (the blurring of the late summer months due to all my activities). Now I have to invent a word that includes July and maybe June. Well, at least being busy beats the alternative…being bored. The **Fightin' Skywagon**, while not the prime contributor to this summer's packed schedule, was involved in many of the events. That was driven home a couple of days ago when I received the report of her latest "blood test" (oil analysis). The analyst at Blackstone Laboratories commented that with "46 hours in the last two months" the wear indicators had significantly decreased and the engine appears to be in the peak of health. While oil analysis is only one of several measurands of engine health, this report does seem to support the premise that regular use is good for the ol' six-banger.

Even with all that VC-180 time recently logged I got to experience the pleasure of "enhanced" security (level ORANGE) procedures on a couple of government-sponsored airline jaunts. These trips and their attendant TSA interactions can be especially irritating to those of us with the means to travel in our own aircraft. However, I noticed that most of the other traveling public has become somewhat numb to the increased time and scrutiny caused by our enemies' persistent threats. I used to see folks bristle somewhat, or at least exhibit an air of increased tension at the screening process, but during this last trip I saw lots of resigned looks, rolling eyes and sheep-like complacency when National Guardsmen were pawing through their carry-ons looking for some form of explosive toothpaste or lip gloss. I wouldn't have been a bit surprised if some rubber-gloved TSA trooper had announced that we would be boarding naked today. Nor would I have been shocked to see my fellow passengers calmly disrobing while chatting on their Bluetooth cell earpieces.

I guess the lesson to take away from this rambling is that we "private" flyers have to remain extra vigilant to ensure that our airports and airplanes don't fall victim to the same rigorous security procedures. All it would take is for some airplane owner to leave his plane or hangar unlocked and for some misguided individual to try and strike some blow for the "jihad". General aviation has weathered several assaults on our flying freedoms from panic-stricken or vote-seeking politicos in various parts of the country. If we don't keep our airports and planes secure ourselves, someone is going to do it for us…and I don't think you'll like it. Can you imagine reporting in person to a government official to justify your flight out to get a $100 burger? That's what is already required for private pilots in Spain. How about having your plane and hangar invaded by bomb-sniffing dogs? Scary prospects, no? If you don't have 1-866-GA-SECURE programmed into your cellphone, you should. This 24/7 hotline (courtesy of AOPA) is one of the best ways to insure that suspicious or illegal activities at our airports get reported to the proper authorities before some dreaded incident occurs.

That's enough preaching for this month. On a much cheerier note, I like to congratulate two ***Project Police*** Troopers on their recent accomplishments. **Forrest "Frosty" Wyatt** has nearly completed his journey through the homebuilding experience by accomplishing his first flight in his RV-9A. I suspect you'll find pictures of the event elsewhere in this month's 'Edge. On the other end of the journey, **"Stormy" Weathers** is anxiously awaiting delivery of his kit from Van's aircraft. I'm looking forward to hearing more details of these important events at the next meeting.

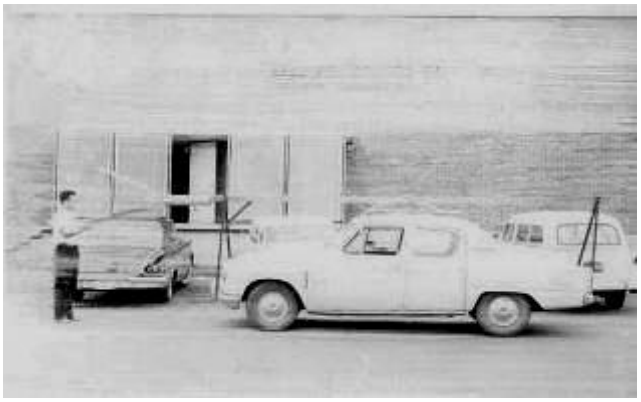
Fly Safe, Check 6, and remain vigilant at the airport!

- Gary Aldrich
Kommanding

Spacecraft Recovery Systems Tested on a 1953 Studebaker

Back in the early 1960's everyone had ideas on how to recover spacecraft. Bell Helicopter looked at using helicopter type rotors for deceleration and for landing spot selection.

Several "wind tunnel" and wind tunnel tests were performed.



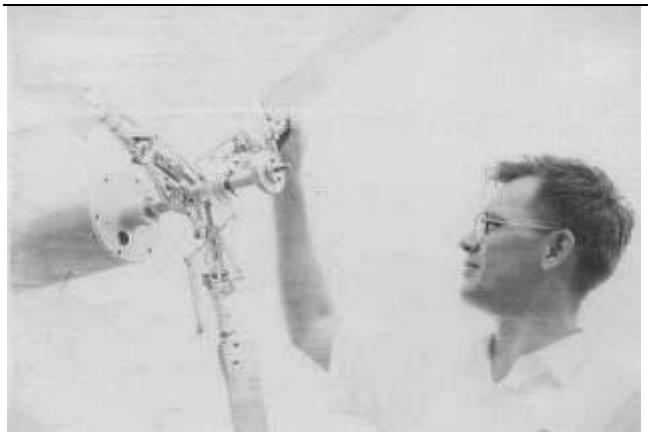
Early 1960's Spacecraft Recovery Rotor Test Vehicle (RTV) Note blades folded forward in the Apollo "stored" position. (Old Polaroid Photo)

The RTV was a 1953 4-door Studebaker Champion. When bought new, the 4-doors were selected to make it easier to carry college girls to church. Later it brought me to Texas to meet Russ's mother. (*The RTV is currently stored in Erb the Elder's garage*)

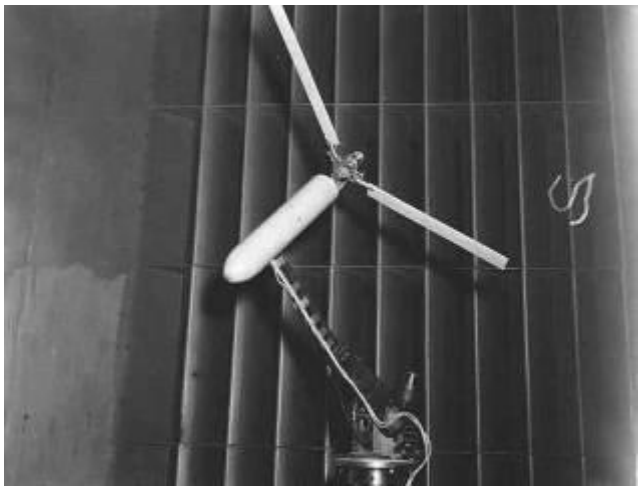
There were several aerodynamic questions regarding the rotor concept:

1. Will the rotor deploy (start rotating) from a folded trail position?

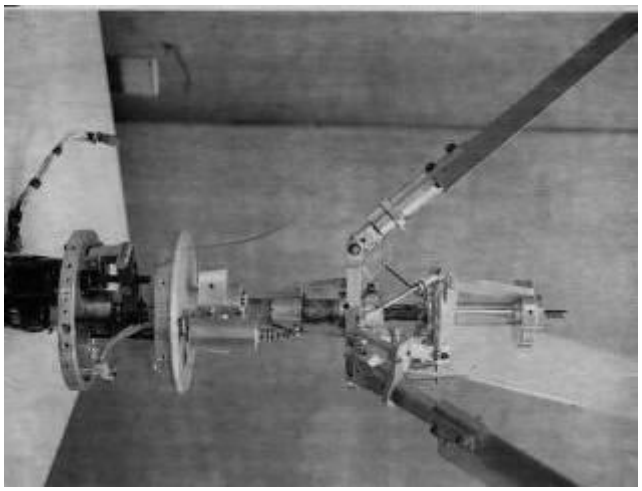
This was found successful even with a large Apollo capsule in front.



A young Erb the Elder "inspecting" the test rotor in the "deployed" configuration mounted on the Studebaker Test vehicle



High angle of the rotor without the capsule. Capsule did not have any noticeable effect.



Bare model rotor in the Apollo stored position. Collective control swashplate is above the rotor hub

2. Will rotor deploy at a large angle to the slipsteam?

The 5-foot model did well even with the Apollo capsule in front.

3. If the rotor blades are folded forward and stored along the sides of an Apollo capsule, will the rotor deploy successfully (start rotating without the blades blowing back and hitting each other)?

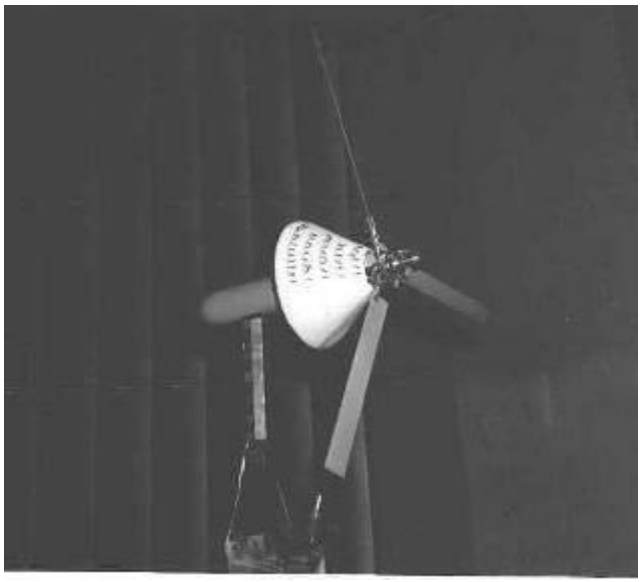
By adding an additional coning hinge, this proved successful.

4. Will the aerodynamic wake of the Apollo capsule adversely affect rotor stability and rotational speed control?

There was very little effect of the capsule wake on the rotor.

5. Can the rotor rotational speed be controlled in the high drag region?

To this we found the solution but I won't tell until I get paid for it.



Rotor model with Apollo model in the low speed section (plenum) of the Vought Low Speed Wind Tunnel. Note the angle to the wind.

Apollo capsule models used in the Vought Low Speed Wind Tunnel. Russ's big brother, Robert, is standing next to the 1961 Rambler Classic with the RTV in the background.

A young Erb the Elder showing a tip brake drag device for rotational speed control. OK for model tests but impractical for real life.

6. Can the rotor be prevented from tumbling throughout the operational envelope?

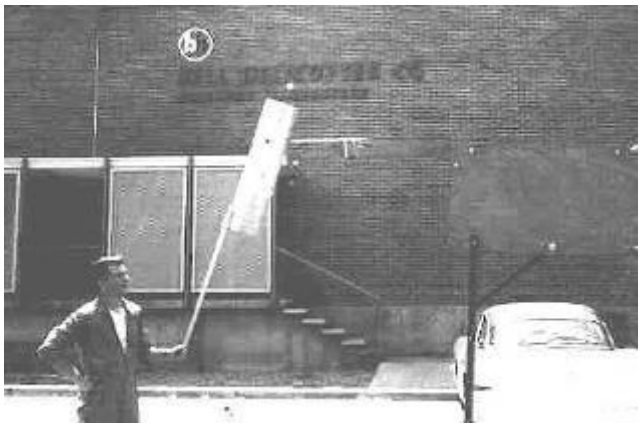
The NASA Langley model rotor in the vertical wind tunnel had tumbled in certain speed regions. We found the solution but I won't tell until I get paid for it.

A 3-bladed, 25-foot diameter rotor was successfully tested in the Ames 40 x 80 foot wind tunnel. I haven't found reproducible photos in my "files" yet.

Overall, the helicopter type rotor was not practical because the system weight fraction was estimated to be 15% where as the parachutes were 4%.

Booster Tank Recovery Concept

The "Maple Leaf" recovery system for the booster tanks was successful in the model form but was not practical. The rotation would have broken the tanks when they landed on (hit) the water.



"Maple Leaf" Recovery System for the booster rockets mounted on the Studebaker test frame. One of the co-op students is holding the model from rotating in the wind.

Mike Paine with the Booster Rocket "Maple Leaf" model. The black streak on the model was for visual counting of rotational speed.

Lee H. Erb, aka Erb the Elder
Det 5, Arlington, TX

Blind versus Driven Rivets

Speaking as an aeronautical engineer (structures) who spent two years on loan to Grumman/Lockheed/Canadair as a blind fastener specialist (the rivets were blind, not me), let me say a couple of things about blind rivets. Most of which I've said before, but some bear repeating.

A pulled-mandrel rivet of any kind is usually limited in its expansion because that expansion is driven entirely by the mandrel, where an AN rivet's degree of upset is actually determined by the hole. This is important because a drilled hole isn't round, it's slightly triangular with three flat spots. On a pull-mandrel rivet (except some very specific ones), the expansion is often not enough to flow into the "corners" of the hole. So the bearing/shear loads are carried by the smaller "flats" of the hole, rather than the entire circumference as with a driven rivet, which actually forms an interference fit with the properly prepared hole.

The result of the limited fit of the pulled rivet, especially in a less than perfect hole, is the localized loads cause local bearing failures in the holes which result in loose rivets due to vibration. A riveted joint depends on total rigidity within each hole. If a rivet can move at all, it's no longer carrying its share of the load so the others have to take up the slacker's load.

Also, only some pulled mandrel rivets are of a "locked spindle" design, meaning, once pulled, a locking ring in the top of the rivet is forced into the mandrel and it can't fall out. This is important because the strength of pulled rivets is usually determined with the mandrel in place. If it falls out, you don't have a rivet, you have an eyelet.

Cherry Bulblocs and Huck MLS rivets and a few others are locked spindle rivets specifically designed to give maximum expansion in thin sheets and as such, greatly outperform the original, and relatively inexpensive,

Cherry MS rivet. A draw back to locked spindle rivets is that they require a double action puller: while the mandrel is being pulled and broken, an inner sleeve pushes down on the locking ring and locks the spindle in place. Another draw back is that they are expensive.

There are a number of pure pull rivets approved for aircraft use, notably the Avex and Avdels. They depend on punched, perfect holes. Otherwise they are only one notch up from a USM pop-rivet.

The shear and bearing strengths of all of these rivets are different than driven AN rivets, so in a lot of applications, it's not a hole for hole replacement. You need more of the pulled rivets than of the driven ones (although, not always). In the case of the BH wings, it's just easier to prevail upon your local RV guy for an afternoon of help.

- budd davisson
(*harvested from the Bearhawk mail list*)

Assorted Oddities

From the San Diego Aerospace Museum:

The placard reads "Reidel Starter Engine

The Jumo 004B jet engine that powered the Me-262 fighter used this two cylinder gasoline engine for starting while on the ground. It was housed in the nose cone where the pull ring was easily accessed by ground crew.

It took about one minute to accelerate the Jumo 004B to 2,000 rpm. The Reidel starter produced 10 hp and weighed 35 lbs."

At Legoland—The Fightin' Skywagon?

Project Police Aircraft Spotters Quiz

As the **Kommandant** was thwarted in his mission to collect photos of oddball aircraft at the **National Museum of the USAF** (nee Air Force Museum) during a recent government sponsored trip to Wright-Patt, **Evil Editor Zurg** has decided to try something a little different this time.

In the style of ***PPO* Mike Machat**, who asked you to identify aircraft by looking at close-ups of mere parts, we bring you this photo:

As always, your job is to simply identify the aircraft shown above and send that information to erbman@pobox.com or to the editor's address seen on the last page of this newsletter. Include any other information you know. Links to web sites with more info are a plus. Next month we'll tell you who (if anyone) was correct.

Web Site Update

As of 9 September 2006, the hit counter stood at **110116**, for a hit rate of about 25 hits/day for the last month.

Just a reminder that the EAA Chapter 1000 Web Site is hosted courtesy of Quantum Networking Solutions, Inc. You can find out more about Qnet at http://www.qnet.com or at 661-538-2028.

Chapter 1000 Calendar

Sep 19: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Oct 3: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

Oct 10: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Oct 17: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Oct 26-29: Copperstate Regional Fly-In. Casa Grande AZ (KCGZ)

Nov 7: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

Nov 14: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Nov 21: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Dec 5: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

Dec 12: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Dec 19: EAA Chapter 1000 Annual Festivus Celebration, 6:00 p.m., Kommandant's Kwarters. Quartz Hill CA. (661) 609-0942

Jan 2: EAA Chapter 49 Monthly Meeting, 7:30 p.m., General William J. Fox Field, Lancaster, CA. (661) 948-0646

Jan 9: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., High Cay, 4431 Knox Ave, Rosamond CA. (661) 609-0942

Jan 16: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Feb 20: EAA Chapter 1000 Monthly Meeting, 5:00 p.m., Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

To join Chapter 1000, send your name, address, EAA number, and $20 dues to: EAA Chapter 1000, Doug Dodson, 4431 Knox Ave, Rosamond CA 93560-6428. Membership in National EAA ($40, 1-800-843-3612) is required.

Contact our officers by e-mail:
President/Flight Advisor Gary Aldrich: gary.aldrich@pobox.com
Vice President George Gennuso: pulsar1@sbcglobal.net
Secretary Kent Troxel: kenttroxel@sbcglobal.net
Treasurer Doug Dodson: dodsond@qnet.com
Technical Counselors: Gary Sobek GASobek@Comcast.net
Ron Wilcox avi.ator@verizon.net Bill Irvine wgirvine@yahoo.com

EAA Chapter 1000 Technical Assistants

Composite Construction		
Doug Dodson	dodsond@qnet.com	661-256-7276
George Gennuso	pulsar1@sbcglobal.net	661-265-0333
Brian Martinez	brianmmartinez@cs.com	661-943-5379
Bob Waldmiller	waldmilr@qnet.com	661-256-0932
Wood Construction		
Bob Waldmiller	waldmilr@qnet.com	661-256-0932
Aluminum Sheet Metal Construction		
Bill Irvine	wgirvine@yahoo.com	661-948-9310
Miles Bowen	cessna170bdriver@yahoo.com	661-822-0806
Russ Erb	erbman@pobox.com	661-256-3806
Welding/Welded Steel Tube Construction		
Russ Erb	erbman@pobox.com	661-256-3806
Engine Installation		
Bob Waldmiller	waldmilr@qnet.com	661-256-0932
Doug Dodson	dodsond@qnet.com	661-256-7276
Electrical Systems		
Miles Bowen	cessna170bdriver@yahoo.com	661-822-0806
Instrumentation and avionics requirements for VFR/IFR		
Gary Aldrich	gary.aldrich@pobox.com	661-609-0942

Inputs for the newsletter or any comments can be sent to Russ Erb, 661-256-3806, by e-mail to erbman@pobox.com

*From the **Project Police** legal section: As you probably suspected, contents of The Leading Edge are the viewpoints of the authors. No claim is made and no liability is assumed, expressed or implied as to the technical accuracy or safety of the material presented. The viewpoints expressed are not necessarily those of Chapter 1000 or the Experimental Aircraft Association. **Project Police** reports are printed as they are received, with no attempt made to determine if they contain the minimum daily allowance of truth. So there!*

THE LEADING EDGE
MUROC EAA CHAPTER 1000 NEWSLETTER
C/O Russ Erb
3435 Desert Cloud Ave
Rosamond CA 93560-7692
http://www.eaa1000.av.org

ADDRESS CORRECTION REQUESTED

THIS MONTH'S HIGHLIGHTS:
REGULAR MEETING AT TPS 19 SEP
FROSTY WYATT FIRST FLIGHT
STUDEBAKER ROTOR TEST VEHICLE
BLIND VERSUS DRIVEN RIVETS

EAA™
The Leader In Recreational Aviation