

The Citeco

Official Publication of the Experimental Aircraft Association
EAA Chapter #393 POBox 272725 Concord, CA 94527-2725

OCTOBER 1997

CHAPTER MEETING

Meetings normally begin at 7:30 PM on the 4TH Wednesday of the month in the terminal building at the end of John Glenn Drive. The next regular meeting will be on Wednesday, October 22.

The speaker for October will be a surprise.

CHAPTER MEETING MINUTES

September 24, 1997. Vice President Bruce Hobbs opened the meeting at 7:30.

Lisle Knight reported that 22 Young Eagles were given rides at CCR on Sept. 13. Duane Allen ran the show, since Lisle was out of town. We also had a friend of Duane's from Chapter 62 who flew up in his LongEze to participate. Thanks to all the volunteers and pilots who gave their time to make this event successful. Chapter 62 invited pilots from our chapter to join them at their Young Eagle rally next weekend

Linda McKenzie reported that Glen Werner's Lancair was judged "best composite" at the Arlington fly-in.

Bruce Hobbs has information on the 1998 "Flight of the Eagles" trip to Oshkosh, if anyone is interested.

Pete Wiebens passed out copies of the NASA incident report form. This form covers any sort of problem, from miscommunication with ATC to near misses. Filing this form immediately after an incident can keep you out of trouble with the FAA.

Pete also told about a situation where he was left in "position and hold" on the runway for five minutes without communication with the tower. It turned out the problem was caused by a failure of the tower's radio. He discussed ways to get out of the situation promptly without causing other problems.

Ken McKenzie reports that the Golden West Fly-In organizers need to fill 50 to 100 subcommittee chairman positions in the next couple of months. Charlie Adkins reiterated that now is the time to get in on the ground floor if you want to be a part of this stupendous event.

TREASURER'S REPORT

Bank Balance	Checking	1714.06
	Savings	2786.52
		4500.58

Jack Reichel gave a very interesting presentation and video on the proposed Enhanced Ground Proximity Warning System. This system is something we can look forward to having in our airplanes in a few years.

NEW MEMBERS

There's lots of interest in EAA these days, attendance at meetings has been great. This month we welcome five more new members. We hope you all continue to attend and will soon be reporting about your projects. Bring your interested friends, too.

James Paulas, belongs to National and is a A&P
Donald Yearout, Private Pilot, Com. & Instructor
Bryan Case, Com. & Instrument rated
Norman Cruz, Private Pilot
Harvard H. Holmes, Student Pilot

BOARD MEETING

Board meetings are held in Bruce Seguine's hangar at 6:30PM on the Wednesday after the chapter meeting. All members are welcome.

FLY-OUTS

The next fly-out will be on Saturday following the meeting (October 25). Come to Bruce and Nancy's hangar on the West ramp around 10:30 a.m. Phone (510) 825-0766.

MEMBER NEWS

Jack Reichel was persuaded by Pete to reveal that he just bought a Cessna turbo 210. for work in his avionics research.

Frank Storm is still working on his RV6, searching for a couple of gas tank leaks.

Charlie Adkins flying his Beech Skipper again.

Harry Heckman is well into the flight test program of his new Lancair 290, and has completed seven or eight flights. The plane trims up better now and is flying nicely.

New member **Harvard Holmes** is finishing up his private license. He's done the whole course in a Citabria.

Pet Wiebens has dug his Glasair I out of the back of the hangar and is starting to get it flyable again. Pete, Bruce Seguire, Lyle Powell and wives made a trip down to San Diego. Nancy and Melody flew the Swift, but even with a head start the Glasair IIs caught up with them around Crows Landing.

Bob Belshe's LyCon IO320 engine for his Lancair was delayed by a defective new cylinder that was only discovered when running the engine at full power on the test stand.

Scott Achelis has been to San Diego a couple of times in his RV6A and also to Oregon.

Chris Kenyon has passed 300 hours on his RV6. He finally found the cause of his four-year! oil leak on his trip up to the RV fly-in. All it needed was a new gasket under the oil temperature sender.

Bill Wilson is building a Glastar, metal work is completed and he's waiting on the fuselage.

Doug Page is slowly completing the wiring of his RV6A.

Tim Glen has already put over 60 hours on his new Kitfox V. The test period is now completed and he's flown to the Kitfox fly-in in Idaho and back.

Fred Egli has received his Lancair IV wings back from the paint shop, and will soon be taking the fuselage over for painting.

Brian Case is a new member looking for a project.

Don Baldwin is waiting for the FAA to come to inspect his Teeny-too project.

Tracy Peters is still working slowly on the RV6. **Pat Peters** is now a pilot after soloing at Rio Vista. Congratulations, Pat!

TECH TOPICS

"Watts" Horsepower

from the "Lycoming Flyer, key reprints"

This interesting article was written for us by Fred Rohm, who was our Chief Qualification Engineer when he retired. Fred had a career of 44 years in the industry, with a majority of those years spent at Textron Lycoming. Most of his career at Lycoming was as Chief Experimental Engineer, which establishes his qualifications to author this kind of article.

James Watt, Scottish physicist, had an engine problem even in 1769. Although steam engines had been invented before he was born, they were crude, inefficient machines and only a few were in use. So he had, after much experimental work, developed a relatively efficient condensing steam engine, the forerunner of the present day type.

Being a good business man, Watt tried to sell his engine to coal mine operators who were then using draft horses to supply power to drive the pumps which kept the mines free

of water. But the mine owners had sales resistance! They insisted on knowing exactly how many horses each engine would replace, or, in other words, the horsepower of the engine. How much work would his steam engine do? This, then, was James Watt's problem.

Although simple machines such as sailing vessels, windmills, and water wheels had been used for centuries, Watt realized that for the most part, the majority of work in the world had been done by man and his domesticated animals. Work was measured and paid for by the day, from "sun to sun". With the advent of reliable clocks, work was then accounted and paid for by the hour. Evaluating work by this time method, it was assumed that all men and animals could and did perform the same amount of work. This was far from being true.

Watt realized that in order to have his steam engine used by the coal mine operators he would have to answer their questions - "how much work will it do, and how many men and horses will it replace?" Since the "power" of one horse was a generally known and a constant quantity, he would have to determine the "power" of his engine in order to compare it with the horses which it was to replace. His problem then was to define "power."

Power did not mean force. The mine owners cared nothing about the force Watt's engine might exert. They wanted to know how fast the engine would pump water out of the mine; in other words, how fast will the engine do the work? Simply, that was the definition of "power."

The methodical physicist experimenting with draft horses used to operate mine pumps found that, on an average, a horse pulling with a force equal to a weight of 150 pounds walked 2 1/2 miles per hour. Since work is force exerted through a given distance, it is measured in terms of feet pounds. Thus, on an average, one horse could do work at the rate of 33,000 feet pounds per minute or 550 feet pounds per second.

Watt's definition for one horsepower, which has now become universal, was, therefore, the doing of work at the rate of 33,000 feet pounds per minute. Today, all conventional power producing units are rated on this basis.

The 250-horsepower engine in the modern light plane is capable of doing work at the same rate as that of 250 average horses. From an interested engineer's point of view, it is capable of moving 137,500 pounds of weight one foot in one second. Yet, what a difference there is in its size and weight (approximately 400 pounds) when compared to the horses it replaces!

$$\frac{12 + 144 + 20 + 3\sqrt{4}}{7} + 5 \cdot 11 = 9^2 + 0$$

Reads as:

A dozen, a gross, and a score
Plus three times the square root of four
Divided by seven
Plus five times eleven
Is nine squared, and not a bit more.

Leaning Textron Lycoming Engines

A direct reprint of Service Instruction 1094D

Revision "D" to Service Instruction No. 1094 supersedes all previous recommendations and should be used for engine leaning during normal flight operations. ALL LEANING RECOMMENDATIONS ARE BASED ON CALIBRATED INSTRUMENTATION.

Textron Lycoming strongly recommends that all engine instrumentation be calibrated annually. All instrumentation for manifold pressure, engine RPM, oil temperature, cylinder head temperature, exhaust gas temperature, and turbine inlet temperature in the aircraft should be included in this annual calibration.

Regardless of the fuel metering device, fuel management of normally aspirated engines is primarily dependent on the instrumentation available. The method is the same for both fixed and controllable pitch propellers.

Textron Lycoming recommendations for leaning turbocharged engines in this Service Instruction refers to Textron Lycoming supplied turbocharged engines. For after market turbocharger installations, contact the STC holder for proper leaning instructions.

CAT (cylinder head temperature) and TIT (turbine inlet temperature) probes are required for leaning turbocharged engines. Refer to latest edition of Service Instruction No. 1422 for proper TIT probe locations and depth.

A. GENERAL RULES

1. Without exception, observe the red-line temperature limits during takeoff, climb and high performance cruise power operation.

(a) Cylinder head temperature - maximum limit listed in the Textron Lycoming Operator's Manual.

(b) Oil temperature limit - maximum limit listed in the Textron Lycoming Operator's Manual.

(c) TIT - maximum allowable limit specified in the Textron Lycoming Operator's Manual.

2. Whenever mixture is adjusted, rich or lean, it should be done slowly.

3. ALWAYS RETURN MIXTURE SLOWLY TO FULL RICH BEFORE INCREASING POWER SETTING.

4. At all times, caution must be taken not to shock cool the cylinders. The maximum recommended temperature change should not exceed 50 deg F per minute.

B. LEANING THE NORMALLY ASPIRATED ENGINES

1. Use full rich mixture during takeoff or climb. Careful observation of engine temperature instruments should be practiced to ensure limits specified in Textron Lycoming operator's manual are never exceeded. Refer to the aircraft POH (pilot's operating handbook) or AFM (aircraft flight manual) for more specific instructions.

2. For 5000 feet density altitude and above, or high ambient temperatures, roughness or reduction of power may occur at full rich mixture. The mixture may be adjusted to obtain smooth engine operation. For fixed pitch propeller, lean to

maximum RPM at full throttle prior to takeoff where airports are 5000 feet density altitude or higher. Limit operation at full throttle on the ground to a minimum. For direct-drive, normally aspirated engines with a prop governor, but without fuel flow or EGT, set throttle at full power and lean mixture at maximum RPM with smooth operation of the engine as a deciding factor.

3. For cruise powers where best power mixture disallowed, slowly lean the mixture from full rich to maximum power. Best power mixture operation provides the most miles per hour for a given power setting. For engines equipped with fixed pitch propellers, gradually lean the mixture until either the tachometer or the airspeed indicator reading peaks. For engines equipped with controllable pitch propellers, lean until a slight increase of airspeed is noted.

4. For a given power setting, best economy mixture provides the most miles per gallon. Slowly lean the mixture until engine operation becomes rough or until engine power rapidly diminishes as noted by an undesirable decrease in airspeed. When either condition occurs, enrich the mixture sufficiently to obtain an evenly firing engine or to regain most of the lost airspeed or engine RPM. Some engine power and airspeed must be sacrificed to gain a best economy mixture setting.

NOTE When leaned, engine roughness is caused by misfiring due to a lean fuel-air mixture which will not support combustion. Roughness is eliminated by enriching slightly until the engine is smooth.

5. The exhaust gas temperature (EGT) offers little improvement in leaning the float-type carburetor over the procedures outlined above because of imperfect mixture distribution. However, if the EGT probe is installed, lean the mixture to 100 deg F on the rich side of peak EGT for best power operation. For best economy cruise, operate at peak EGT. If roughness is encountered, enrich the mixtures lightly for smooth engine operation.

6. When installing an EGT probe, the probe must be installed in the leanest cylinder. Contact the airframe or kit manufacturer for the correct location. In experimental or custom applications, multiple probe instrumentation is required and several power settings should be checked in order to determine the leanest cylinder for the specific application.

7. During normal operation, maintain the following recommended temperature limits:

(a) Cylinder head temperature - limit listed in the Textron Lycoming Operator's Manual. (b) Oil temperature - limit listed in the Textron Lycoming Operator's Manual.

8. For maximum service life, maintain the following recommended limits for continuous cruise operation:

(a) Engine power setting - 65% of rated or less. (b) Cylinder head temperatures - 400 deg F. or below. (c) Oil temperature - 165 deg F. - 220 deg F.

CHAPTER 393 VIDEO LIBRARY

We have recently acquired the ESPN production covering EAA '95. This video will be in the library for the June meeting. The complete list of titles is listed on the box which is brought to each of our meetings. Check out the offerings and, if something interests you, CHECK IT OUT. The rules for the library are very simple. It is run on the honor system. You sign out for the tapes you borrow; and you return them at the next meeting so they are available for others.

NEWSLETTER SUBMISSIONS

All contributions for the newsletter are welcome! If you have something to say or share with the rest of the club members, do it here! Please submit any articles and/or photographs you think others will enjoy and learn from. Submissions should be done in writing and mailed directly to the newsletter editor. Submissions may be e-mailed, hand written, typed, or on any IBM diskette (in ASCII or MS Word). The deadline for submissions to the editor is the 14th of every month (newsletter is produced and mailed by the 17th). The editor's e-mail address is: rab@netcom.com.

EVENT CALENDAR

- Oct 19 **PANCAKE BREAKFAST** 9:00 a.m. to Noon
Everyone is Welcome!! Fly-In or Drive Over! Sponsored by the Mt. Diablo Pilot's Association MDPA Club House, Buehanan Field Airport (CCR), West Side, 200 Sally Ride Drive (510) 685-7073
Pancakes, Sausage, Juice, and Coffee \$3.50 (members and non-members) Bring your family and friends!! Fly-in and park right in front of the Club House in our spacious, paved tie-down area. Just ask the tower to taxi to MDPA for breakfast!
- Oct 31-Nov2 Fox Field National Air Races, Lancaster, CA 805-940-1709
- Dec 14 **Chapter 393 Annual Christmas party at Petar's.**

CLASSIFIED ADVERTISING

Items for sale by club members may be placed in this newsletter for **FREE!** Please submit your **FOR SALE** items to me in writing no later than the 14th of the month. Normally, your ad will run for two issues, unless you request more or tell me that the item is no longer for sale.

Wheeler Express Kit

4 place, fixed gear, approximately 200MPH cruise, uses engine up to IO540. Cost \$20k originally, asking \$10k. This kit was donated to Solano Community College, contact Paul E O'Hara, 707-864-7154.

GOODIES FOR SALE

CARBURETOR, ELLISON EFS 2 throttle body \$250.00
MAGNETO, BENDIX FOR VW. \$275.00

STARTER, HI-TORQUE VW \$50.00
PROPELLER, ED STERBA 52X50 \$110.00
1 PR TIRES FOR KR-2 (retract) \$20.00
NAV/COM, RST 360 w/DIGITAL NAV HEAD \$395.00
TRANSPONDER, MDL, W/ACK A-30 ENCODER WITH COLLINS ANTENNA \$350.00
MAC trim servo motor w/dash mounted indicator light and toggle switch \$50.00
ELT, Garrett (R-88) \$75.00
LORAN, RAY JEFFERSON PL99 \$45.00
HELMET, DAVID CLARK series K with DC H10-30 headset \$100.00
INTERCOM, RST 2 position w/radio input and record output, 12v plug. (a 2nd unbuilt 2 position kit included) \$50.00
GPS, APOLLO 920 w/remote antenna, 12 power supply, yoke mount, nylon case manual and PC upgrade kit w/interface \$750.00
TRANSCIEVER, DELCOM AIR-960 handheld with headset adapter and PTT switch \$160.00
PUSH to TALK switch DC C10-15 \$25.00
2 NEW FLIGHTCOM HEADSETS (stereo) w/BAGS \$100.00EA
Contact **ED FERNHANDEZ (510)934-5049** for any of the items above.

Three passengers board a small airplane...the President, the Pope, and a hippie. Suddenly the pilot tells them the plane is in serious trouble, but there are only two parachutes for them, so they have to figure out who will be left without one. The President immediately grabs a parachute and bolts out the door screaming "I'm too important a man to die!". The Pope and the hippie look at the remaining parachute, and then at each other, and the Pope speaks. "My son, I have lived a good, long life, and I have faith that I will go to a better place. You take the last parachute, my son." The hippie giggles and hands the Pope the parachute saying "Nah, that's ok, you have this one... I'll take this one. The President just jumped out holding my knapsack."

USAir recently introduced a special half fare for wives who accompanied their husbands on business trips. Expecting valuable testimonials, the PR department sent out letters to all the wives of businessmen who had used the special rates, asking how they enjoyed their trip.

Letters are still pouring in asking, "What trip?"

EAA Christmas Dinner

All members, Spouses, Companions, Guests, and Others welcome

Sunday, December 14, 1997

No Host at: Petar's

32 Lafayette Circle
Lafayette , CA

Friendship Hour: 1730 - 1830 hours

**Menu: Prime Rib, Chicken or Salmon, with salad, vegetables, rice and Dessert.
\$20.00 per person.**

Mail your check and this order form to :

EAA Chapter 393
P.O. Box 272725
Concord, CA 94517-2725

All reservations must be received by December 5 (but reserve early so that you are at the top of the list).

If you have any questions, Please call Louis Goodell @ 682-4198

Menu Item	Number	Price	Cost (# times price)
Prime Rib		\$20.00	
Chicken		\$20.00	
Salmon		\$20.00	
Total Enclosed			

Name(s) of attendee(s)

NOTE: Please enter the full name of each attendee as you would like it printed on his/her name tag .

THE EXPERIMENTAL AIRCRAFT ASSOCIATION
CHAPTER #393 NEWSLETTER, OCTOBER 1997

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(45) Dues paid to 2/28/98

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Next meeting Wednesday October 22, 1997