

HANGARTALK

Newsletter of Experimental Aircraft Association Chapter 84 at Harvey Field in Snohomish, WA

March, 2008

PRESIDENT'S CORNER

Hello, all. I have been working as an airplane mechanic since 1976 (legally), and way before that as an un-certificated one, and the following is what I feel is going to have to transpire for us to maintain the aging fleet, so here goes. Along with the pilot shortage and the mechanic shortage, there is also a parts shortage that plagues the general aviation industry. Because supply and demand are out of balance, the cost of new and used parts seems to increase every day. Let's examine the reasons why this is so.

First, we have an old fleet. The average general aviation (GA) single engine airplane is approximately 32 years old. The average age of GA multi-engine reciprocating aircraft is close to 27 years old. The average age for the turbine powered multi-engine propeller driven aircraft average out around 19 years of age. So because of long term wear and tear the demand for replacement parts and large sub-assemblies is much greater today than it was even 10 years ago.

The second reason is our general aviation fleet has been well maintained over the years. So well maintained in fact, the average GA aircraft with a mid-time engine and decent avionics has appreciated to two or three times its original purchase price and is still climbing. Yet even in that land of many zeros the older aircraft are still substantially lower in price than the cost of a brand new aircraft with similar performance numbers and equipment. So, the value of older aircraft in good shape is proven investments that over time have beaten the DOW JONES average. So we have an economic imperative on the part of the owners to keep maintaining older aircraft in flying condition which increases the demand for replacement parts.

The third reason is the increasing production costs to make a part. Today, aircraft manufacturers are not making makes and models of aircraft in the same quantity they made them back in the Seventies. So the production runs for parts are not as frequent and not as many parts are reduced. In addition, it is not cost effective for a manufacturer to make a lot of parts even if the unit price for each part is out of this world because taxes on maintaining a large inventory of parts would eat all of the profits. This low parts production keeps the supply of replacement parts low.

The fourth reason is that some manufacturers would prefer that their older makes and model aircraft-made a million years ago-would quietly disappear from the aircraft registry. This retroactive birth control on the part of the manufacturers may seem not to make any sense until you look at aircraft market dynamics of creating demand and reducing costs. First, each older aircraft that is no longer in service creates a demand for a new, more expensive aircraft to take its place. Second, despite some tort claim relief granted to GA manufacturers in the early Nineties, the fewer older aircraft there are in service, the manufacturers of those aircraft enjoy reduced overall liability claims and ever decreasing continuing airworthiness responsibilities.

So how are we going to maintain these older aircraft with an ever dwindling parts supply when Part 21, section 21.303 Replacement and modification of parts, requires us to use the Parts Manufactured Approval (PMA) parts on a type certificated product? Well, the same rule grants four exemptions to the PMA requirement. You can use parts produced under a type or production certificate such as a Piper, Cessna, or Mooney produced part. You can use an owner or operator produced part to maintain or alter their own product. You can use parts produced

under a Technical Standard Order (TSO) such as radios, life vests and rafts, and GPS. You can use a standard aviation part such as fasteners, washers, or safety wire.

Before I segue into the subject of "owner produced parts" as called out in section 21.303, which is the purpose of this article, I would like to create a small uproar with this statement: "FAA Airframe and Power plant rated mechanics can maintain, repair, and modify parts, but they cannot make a brand new part and call it a repair." Before you accuse me of losing dendrites by the minute, check out section 65.81, General privileges and limitations. The section talks about maintenance, preventive maintenance, and alterations, but not the manufacturing of parts. Nor is it an implied privilege in Part 65, because Part 21, section 21.303 says, "no person" may make a replacement part for a type certificated (TC) product unless that person has a PMA, etc. I worked in the real world and I specialized in making engine baffles for Lycoming engines. Before someone accuses me of bureaucratic ventriloquism which is roughly translated as "talking out of both sides of my mouth, my weak defense is that. "I made the parts because I thought I could." It never dawned on me that I could not legally make a part. Some of you may be astounded that I make this confession freely. It's no big thing because I know the statue of limitations has run out years ago and a jury of my peers would never look me in the eye and convict me. So here is the problem that we must solve. Since mechanics cannot legally make parts for aircraft and aircraft need replacement parts, how are we going to keep the fleet flying? If we cannot find PMA, TSO, standard, or production holder replacement parts, we are left to make the part under the owner-produced option under section 21.303(b)(2). However, we must remember that the part is for the owner/operator aircraft only, and is not manufactured for sale to other TC aircraft. To get through confusing regulatory policy with our pride intact, let's try the question and answer routine. (Note: This policy is taken from FAA's AGC-200 policy memorandum to AFS-300 on the definition of "Owner-Produced Parts" dated August 5, 1993)

Question 1: Does the owner have to manufacture the part him or herself in order to meet the intent of the rule?

Answer 1: No, the owner does not have to make the part him or herself. However to be considered a producer of the part he/she must have participated in controlling the design, manufacturer, or quality of the part such as by providing the manufacturer with the design or performance data from which to make the part, or by providing the manufacturer with the materials to make the part, or by providing the manufacturer with fabrication processes or assembly methods to make the part, or by providing the quality control procedures to make the part, or by personally supervising the manufacturer of the part.

Question 2: Can the owner contract out for the manufacture of the part and still have a part that is considered "owner-produced?"

Answer 2: Yes, as long as the owner participated in one of the five functions listed in Answer 1.

Question 3: Can the owner contract out the manufacture of the part to a non-certificated person and still have a part that is considered "owner-produced?"

Answer 3: Yes, as long as the owner participated in one of the five functions listed in Answer 1.

Question 4: If a mechanic manufactured parts for an owner, is he/she considered in violation of section 21.303(b)(2)?

Answer 4: The answer would be no, if it was found that the owner participated in controlling the design, manufacture, or quality of the part. The mechanic would be considered the producer and would not be in violation of section 21.303(a). On the other hand, if the owner did not play a part in controlling the design, manufacture, or quality of the part, the mechanic runs a good chance of being in violation of section 21.303(b)(2).

Question 5: What kind of advice can you give on how a mechanic can avoid even the appearance of violating section 21.303(b)(2)?

Answer 5: First, a mechanic should never make a logbook or maintenance entry saying that he/she made a part under his certificate number. This faux pas will send up a

flare and get you undue attention from your local FAA inspector, which you could do without. However, the mechanic can say on the work order that he helped manufacture an owner-produced part under section 21.303 (b)(2). Second, the owner or operator should be encouraged to make a log book entry that is similar to section 43.9 maintenance entry that states: The part is identified as an owner produced part under section 21.303(b)(2). The part was manufactured in accordance with approved data. The owner/operator's participation in the manufacturer of the part is identified, such as quality control. The owner must declare that the part is airworthy and sign and date the entry.

Question 6: Is there anything else a mechanic must do?

Answer 6: *The mechanic must ensure that the owner-produced part meets form, fit, and function, and, within reasonable limits, ensure that the part does meet its approved type design (e.g. like looking at the approved data used to make the part). Then the mechanic installs the part on the aircraft, makes an operational check if applicable, and signs off the required section 43.9 maintenance entry.*

Question 7: What is the owner responsible for and what is the mechanic responsible for concerning owner-produced parts?

Answer 7: *The owner is responsible for the part meeting type design and being in a condition for safe operation. The mechanic is responsible for the installation of the owner-produced part being correct and airworthy and for a maintenance record of the installation of the part made.*

Question 8: How does the owner or operator get the approved data to make a part if the manufacturer and other sources are no longer in business?

Answer 8: *For aircraft that the manufacturer is no longer supporting the continuing airworthiness of, the owner or operator can petition the FAA Aircraft Certification Directorate under the Freedom of Information Act for the data on how the part was made. Or the owner or operator can reverse engineer the part and have the data approved under a FAA field approval or, if it is a really complicated part, have the data approved by an FAA engineer or FAA Designated Engineering Representative.*

Question 9: What happens to the owner-produced part on the aircraft if the original owner sells the aircraft?

Answer 9: *Unless the part is no longer airworthy, the original owner-produced part stays on the aircraft.*

I hope that I spread some light on the murky subject of owner-produced parts, so the next time, instead of saying to the owner of a broken aircraft: "Sure, 'I' can make that part," you will now say "Sure, 'WE' can make that part."

FOLLOWUP FROM FEBRUARY MEETING

At our last meeting, Wade Sullivan from WASAR was asked a question he could not answer. Herewith is Wade's answer:

"There was a question in the meeting that I wasn't able to answer about using experimental airplanes for SAR here in Washington. I finally got an answer back from WSDOT:

"We do not use anything (other) than aircraft with Standard Airworthiness certificates in the Normal or Utility Category."

I am disappointed by that, but there it is. If it comes up again, now we know that answer."

Additionally, he did not have a sufficient number of ELT Handouts to distribute, so he asked me to include the information in this issue of the Newsletter. Below is the Summary Comparison Table of the **121.5** and **406** MHz versions of ELT's. On the next page you will find the entire NOAA ELT Comparison Table.

Comparing ELT Types

TYPE	121.5	406
Location Accuracy	12nm	2nm
Coverage	Local	Global
Signal Power	.1W	5W
Alert time	1.5-2.0 Hours (LEOS)	Instantaneous (GEOS)
Doppler Location	2 Passes (LEOS)	1 Pass (LEOS)

FROM THE NOAA WEB SITE

COMPARISON OF THE 406 MHz AND 121.5 MHz DISTRESS BEACONS

The following table compares 406 MHz and 121.5 MHz beacons in these critical areas:

406 MHz Beacons

Coverage:

- **Global**

False Alerts:

- **All alerts come from beacons.** Satellite beacon transmissions are digital, coded signals. **Satellites process only encoded data, other signals are rejected.**

- About 1 in 12 alerts are actual distress.

- **Beacon-unique coding/registration allow rapid incident corroboration. Registration mandatory since 1994. 90% beacons registered. About 70% of false alerts are resolved by a phone or radio call to registration POCs prior to launching SAR assets.**

Alerting:

- **First alert warrants launch of SAR assets. Earlier launches puts assets on scene sooner--Average 3 hrs saved in maritime, 6 hrs in inland.**
- Average initial detection/alerting by orbiting satellites is about 45 minutes.
- Average subsequent satellite passes every 60 minutes.

Vessel/aircraft ID, point of contact information provided with alerts allows rapid verification or stand-down.

- Allows false alert follow-up to continuously improve system integrity/reliability.
- **Near instantaneous detection by geostationary satellites. System provides world-wide coverage.**

Position Information:

- **1-3 nm (2-5 km) accuracy** on average. Position calculated by Doppler shift analysis.
- **Less than 100 yard accuracy with GPS-equipped beacons. GPS position processed with initial alert. Major beacon enhancement.**

Locating the Target:

- **Superior alert (non-GPS) position accuracy limits initial search area to about 25 sq. nm (65 sq. km).**
- **GPS-equipped beacons reduce search area to a significantly smaller area.**
- 121.5 MHz homing signal facilitates target location by radio detection finder equipped search units.

Power Output:

- **5.0 Watts** (Strong power output)

Cost:

- Average cost is \$1000 (GPS-equipped EPIRB)
- Average cost is \$500 (Personal Locator Beacon)
- Average cost is \$1500.00 - \$3000.00 (ELT)

121.5 MHz Beacons

- **Ground station dependent;** ground stations have an effective radius of about 1800 nm (2300 km). Both ground station and beacon must be in satellite footprint. Current coverage is about two-thirds of the world.

- **Only about 1 in 5 alerts come from beacons. Satellites cannot discern beacon signals from many non-beacon sources. Beacons transmit anonymously with no unique identifier. Non-beacon interferers have included ATM machines, pizza ovens, and stadium scoreboards!**

- **Fewer than 2 in 1000 alerts and 2 in 100 composite alerts are actual distress.**

- **Since 121.5 MHz beacons transmit anonymously, the only way to ascertain the situation is to dispatch resources to investigate - a costly disadvantage.**

- **High false alert rate makes first-alert launch unfeasible.** Absent independent distress information means RCCs must wait for additional alert information.

- Same as 406 MHz.

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- **Alerts are anonymous. 121.5 MHz analog technology not capable of transmitting data.**

- No false alert follow-up capability

- No GEO detection capability = no instantaneous detection.

- **12-15 nm (15-25 km) accuracy** on average. Position calculated by Doppler shift analysis.

- **No GPS capability.**

- **Initial position uncertainty result in 500 sq. nm (800 sq. km) search area on average.**

- **No GPS capability.**

- Same as 406 MHz.

- **0.1 Watt** (Weaker power output) – Hard for satellites to detect

- **Average cost is \$200.00 - \$400.00 (EPIRB)**

- **Average cost is \$600.00 - \$1200.00 (ELT)**

- **o 121.5 MHz beacons are being phased out**

EAA Chapter 84, Minutes of February 12, 2008
Submitted by Harold Shoemaker, Substitute Secretary

President Rand Martin, called the meeting to order at 7:00 PM. 28 members and guests present.

Presidents Report:

Rand stated that this is the time to be thinking about future project visits. He said there wasn't anything planned for this weekend. After some discussion, Jim Davison offered to show his plane, which is now up at Arlington Airport R-3. It has been inspected and signed off by the FAA.

Rand noted that there were some new faces in the crowd and asked them to introduce themselves. Craig O'Neal, who has plans in mind for a GP 4. and James Morse were present for the first time. Rand asked Larry Sittauer how he was coming, and Larry stated that he has now moved his plane up to his hangar and has been building the wings. Rand turned to Vice President Tom Mahon to talk about the web site. Tom stated that Ron Ulbrich was moving to Utah, and could no longer be the webmaster.. Tom then said that at the last staff meeting, Tom Williams was removed from the Chapter Secretary position. Wayne Stafford was asked to fill the remainder of Tom's term. Tom also stated that those members that hadn't paid there dues yet, need to pay up so the new roster being printed will be current and unpaid members will be dropped off the roster.

New Business: Rand reported that there was no new business to discuss.

Treasurer Report: Nick Gentry reported that our assets include \$499.13 in the bank, \$848.22 in cash bringing the total to \$1347.35.

Secretary Report: The minutes of the last meeting were not published in the newsletter nor were they available at the meeting. Tom Williams was out of town and couldn't be reached. Staff members will try to get the January minutes at a later date and post them on the website.

Project Visit: The project visit will be at Jim Davison's hanger, at the Arlington Airport at Hanger R-3 near the run up area for runway 34, Saturday, February 16th, 10:00 AM.

Safety Report: Rex Smith talked about the change to the ELT's in February 2009. He said the price tag would be pretty high for the new units, but it wasn't mandatory that you have a new unit.

Meeting Program: The program tonight was two separate presentations. One by Wade Sullivan on search and rescue, where he presented a power point presentation, and answered questions.

The second was by Jacques Durringer, who gave a presentation on the planning and building of his new airplane. He has about 650 hrs and around \$7000.00 invested so far. His presentation was well received and generated many questions from the audience. By the reaction of the group, this is someone that should be scheduled for a project visit. Jacques stated that he would be interested in having a partner on his Mini Max, if anyone is interested.

Meeting adjourned at 9:00 pm.

CH 701 Update

Rand Martin has purchased the Zenair CH701 Floats for \$2,000.00. That is a significant addition to our treasury! The remainder of the parted out CH701 gear was advertised on Craig's List March 3rd, and may be advertised in The Little Nickel and some other classified advertising publications. If you or someone you know is interested, contact Chum Shoemaker @ 360-659-6808. Here is what we are currently selling:

IVO PROP, used. Ground adjustable, 14.2 pounds, 30 to 90 pitch range. Make offer, sells new \$890.00.

Airplane Engine, Subaru EA81 with Hearth reduction drive, 165 hp, 2.5 liter four cylinder opposed engine. Make offer.

Zenith 701 fuselage parts, including landing gear, doors, instruments, flight controls, wings, etc.

Urgent Note

Don Veurink sold a manometer at our auction last May and needs to find the person who bought it. Please contact Don at the next meeting or call him at (425) 338-4905. Don also has a Wicks Aircraft electric flap actuator for sale. It was mounted on his plane, but removed before it was ever used. He is asking \$175.00 for it.



The Leader In Recreational Aviation



c/o Nick Gentry
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(MAR, 2008)



Our thanks to the Folks at  *for the use of the Hangar*

*** See you at the Meeting March 11th ***

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