Carb Heat

NEWSLETTER

Hot Air and Flying Rumours
Vol 30 No. 2

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Next Meeting:

Thursday Feb. 17, 2000 8:00 PM
National Aviation Museum

Presentation by our very own:
Pat Floyd
who will share his experiences as a Bush and Ferry pilot

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This continues to be an unusually mild winter so far with modest amounts of snow on the ground. Those that have continued to fly are enjoying the unique benefits of winter flying without paying the normal price. Enjoy it while you can!

January Meeting Summary

Dick Moore gave a virtuoso performance describing the theory and practical issues surrounding corrosion control in aircraft structures. The theory section was worthy of an undergraduate course in aeronautical engineering. The practical side covered a compendium of advice from numerous knowledgeable sources, and a guide to various products available locally to address the insidious effects of corrosion.

Dick deserves a hearty thank you for an exceptionally fine job. I have had nothing but positive comments from attendees. If you missed this one, you missed a good one!

Look forward to seeing a copy of his presentation material on our web site soon.

Workshop etiquette

One of the most amazing things about Oshkosh is the relative cleanliness of the exhibition site. This is due to the pride and selfless diligence of the EAA members that is captured perfectly in the "**EAAers don't Litter**" motto. Not only do they not litter; they are quick to pick up after the occasional thoughtless member or the general public, usually taking the opportunity to advise the offending party of the high standards we set for ourselves.

I expect the same high standards to apply to our own members using our chapter club house and workshop facilities.

Unfortunately, while most members live up to this goal, it would appear that a very small minority need to clean up their act a bit.

Typical problems include:

1. Forgetting to lock the tool crib door or the shop door after use
2. Failing to clean up after use of the lathe, mill, band saw, grinder, shear, or drill press.
3. Failing to turn the temperature down in the shop before leaving, or turn off the lights. Electricity costs run over one thousand dollars per year, with 80% in the winter months; so this is a very important item.
4. Failing to take a full garbage bag home for disposal, preferring to wait for someone else to do it.
5. Failing to replace broken drill bits.
6. Failing to return tools to their proper home. Wrenches and screw drivers seem to disappear with alarming regularity; make sure none of these orphans accidentally end up in your own toolbox.
7. Damaging tools in the shop without repairing or replacing them. The most recent example is an expensive live lathe centre was ground down on the grinder for some inexplicable reason.
8. Failing to lock the clubhouse before leaving exposing our assets to theft.

Unfortunately, I could go on and on; but the real issue is we must pull together to protect our assets. We must all set a good example for others to follow.

If you see someone misusing our facilities then please speak up, and encourage them to mend their ways. If you are too shy to do this, then let a member of the executive know, so we can deal with the problem. While we hope that a simple reminder will suffice, in rare occasions, stronger action is needed. Help us protect our assets.

Only full members are allowed to use our workshop facilities. We will be posting a list of full members in the workshop. If you notice someone not on the list using the facilities, please challenge them.

We are also planning to replace our existing locks and re-issue new keys to gain more control over use of our facilities.

By working together, we can protect our valuable club assets.

February 17th Meeting

Our February 17th meeting will be held at the Bush Theatre at the National Aviation Museum; 8:00 PM start. Our featured speaker will be our own **Pat Floyd** who will share his experiences as a Bush and Ferry pilot. Irving Slone assures me this will be a very interesting talk, based on his countless hours spent with Pat and Don on their Pietenpol Oshkosh Odyssey.

Gary

A note from the Editor

Iím pleased to announce that with the purchase of a new and faster computer in the New Year, Iíve finally been able to move the newsletter-editing job from my work computer to my home computer. Note that my home email address is cbgregoire@sympatico.ca

STRESS and the Pilot

By Melchor J. Antuñano, MD

Stress is a term commonly used by people without necessarily knowing exactly what it means. Different people have different definitions of stress; for some, stress defines the factors that cause the body to respond, while for others it defines the human responses to the insult. A more accurate and comprehensive definition of stress involves the biological responses of the human body to any physical, physiological, and psychological demands (known as stressors). In other words, stress defines the alteration of the normal state of biological equilibrium of the human body due to physical, physiological, and psychological stressors, and the resulting compensatory responses of the body to restore such an equilibrium.

Physical stressors in aviation are associated with the flight environment:

- Low barometric pressure (leading to hypoxia, expansion of body trapped gases, decompression sickness);
- noise and vibration (leading to fatigue and impaired visual and psychomotor performance);
- unfamiliar motion and inadequate orientational cues (leading to airsickness and spatial disorientation);
- linear and angular accelerative (G) forces (leading to sensory illusions, redout, greyout, blackout, G-induced loss of consciousness);
- sudden decelerative forces (leading to injuries);
- extreme temperature and humidity (leading to thermal stress and impaired performance);
- breathing-air quality (leading to illnesses and/or diseases);
- solar/cosmic radiation.

Physiological stressors include: fatigue, sleep loss/deprivation, illnesses and diseases (acute and chronic), poor physical fitness, inadequate diet/nutrition, inadequate hydration, excessive body weight, drug and alcohol use/abuse, use of medications (non-prescription and prescription), excessive caffeine consumption, and tobacco use.

Psychological stressors involve human mental (cognitive and psychomotor) and emotional responses to socio-cultural, family, and job-related factors. Person-person, person-machine, and person-environment interactions can be sources of psychological stress. Personal life changes known to produce significant stress include: death of spouse, divorce, marital separation, detention in jail or other institution, death of a close family member, major personal injury or illness, marriage, being fired from work, marital reconciliation, retirement from work, major change in health or behavior of family members, and pregnancy.

In addition, pilots can experience stress when confronted with emergencies, unexpected situations, or unfamiliar events during the operation of an aircraft. Flying in bad weather, at night or over open water, flying alone, performing an instrument approach to minimums, experiencing lengthy delays (due to traffic, weather, equipment, scheduling, etc.), flying in a high-density traffic area, flying into unfamiliar airports, becoming temporarily lost inflight or approaching/landing at the wrong airport (geographical disorientation), experiencing a near midair collision, having equipment malfunctions, having conflicts with other crewmembers or ATC personnel, being subject to flight checks, exceeding individual piloting skills, and transitioning to a more complex aircraft, are some examples of events that can be the direct cause of stress and/or aggravate pre-existing stress. In general, any activities characterized by high workload such as takeoffs, approaches, and landings involve varying levels of stress. Highly automated cockpits (glass cockpits) can be an additional source of stress for pilots, especially for those transitioning from older aircraft with limited automation to newer aircraft.

Everyoneś life is characterized by constant changes that can cause stress, and cannot be easily avoided or eliminated. Stress, per se, is not bad; some degree of stress is necessary to stay healthy, motivated, and alert and to avoid boredom and complacency. On the other hand, excessive stress can be unhealthy, it can impair performance, lead to errors, and cause incidents or accidents. Individual tolerance and susceptibility to stress varies from one person to another, as do the individual mechanisms to cope with stress. Stress tends to be cumulative, and, if it is excessive, it can overload a pilotś ability to safely operate an aircraft. Knowledge, understanding, and experience are important factors that can improve a pilotś ability to deal with stress. However, overconfidence on these same factors can also lead to failure to recognize (or denial of) a stressful condition.

Even the best pilots in the world are, at one time or another, subject to significant pre-flight stress (problems involving family, job, finances, health, etc.), and do not have sufficient reserves left to cope with the demands (inflight stressors) of flying an aircraft. Stress can be manifested by any of the following signs and symptoms: anxiety, irritability, excitability, impulsiveness, aggressiveness, emotional overreaction, insomnia, depression, crying for no reason, emotional or physical isolation from others, problems concentrating, confusion, difficulty remembering important information, increased self-doubt, nightmares, fatigue, trembling, weakness, diarrhea, indigestion, frequent need to urinate, migraine headaches, grinding of the teeth, cold sweating, increased smoking or overeating, loss of appetite, alcohol and drug use/abuse. An effective approach to deal with stress includes:

- Defining the source of stress
- Evaluating available resources for problem-solving (including professional advice from a psychiatrist or a psychologist)
- Exploring possible solutions (including relaxation therapies)
- Selecting the best solution
- Taking action
- Evaluating the outcome
- Making corrections or changes (if needed) and trying again

The best decision a pilot can make when experiencing a significant

level of stress is not to fly.

Famous Pilot Biographies: Antoine de Saint-Exupéry

1900 - 1944

Born in Lyon in 1900 into a wealthy French family, he was educated first by Jesuits until his unruly behavior proved too much for them. In 1922, after having been an art student and an actor, he went to Strasbourg for a formal military course in flying. Demobilised in 1923, he worked for a time at a roof tile factory, and later sold trucks.

Naturally, in 1926, he jumped at the chance to fly as a commercial pilot making regular trips on the dangerous Toulouse - Dakar run, with monsieur Didier Daurat as his superior (Rivière in 'Night Flight'). Here, he met the veteran mail flyer Guillaumet and they became friends. Two years later, Saint-Ex, Guillaumet and Mermoz were flying the first airmail routes in South America from Brazil to Patagonia.

When the company got into financial difficulties, he went back to Europe where he had a hard time finding work. He flew in the 1932 King's Cup air races, at which event he met Beryl Markam. From 1932 to 1935 he flew airmail from France to the Sahara. He and his mechanic Prévost nearly died of thirst on a desperate record breaking trip that ended in a crash landing in the desert. After that, he went to Spain and wrote newspaper articles about the Spanish Civil War. Back to South America again, where he crashed, this time so severely that he needed a full year to recover. He used this time to finish *Terre des Hommes*.

At the outbreak of war he enlisted in the French Air Corps Reserve and when France fell, he disappeared after being captured by the Germans. It was feared that he had been executed, but he turned up again in Portugal, after escaping from his captors despite having his aeroplane shot from under him. He spent the early 1940s in America as an established writer. 43 years old, he returned on active service to North Africa, and was killed in 1944 under mysterious circumstances on a wartime flying mission over the Mediterranean.

His books are simply about passion for life. 'Saint-Ex clearly understood that flying - especially the type of long and dangerous kind that he was engaged in - was both a metaphor and a brilliant illumination of human nature. Like flying into uncharted territory, our journey through life is fraught with perils, faced mostly alone and with few witnesses to our acts of courage or cowardice.'

books:

Courrier-Sud; Southern Mail (1928): Toulouse - Dakar
Vol de Nuit; Night Flight (1931): South America
Terre des Hommes; Wind, Sand and Stars (1939): Northern Africa and Spain
Pilote de Guerre; Flight to Arras (1942): flying in Europe at war
Lettre à un Otage; Letter to a Hostage (1943)
Le petit Prince; the Little Prince (1943)
Citadelle; Wisdom of the Sands (1948): unfinished

on the web:

the official Exupery site in French
a page with links and quotes in English

Some Notes on Aircraft Design

from EAA Chapter 266

I took this out of the EAA Chapter 266 (Montreal) Newsletter. The chapter had run a series of lectures on a bi-weekly basis from March 9 to August 10 at John Abbott College. Below is a description of one the lectures on Aircraft design written by Bob Gairns.

The subject on June 1st was Aircraft Design. First to speak was Joe Hanson. Not Yet a pilot, he joined EAA in 1994. With an interest in design, as an engineer he analysed the logical steps to take in the design process. These are:

1. Prepare an aircraft configuration
2. Analyse performance
3. Compare with requirements
4. Modify design if necessary
5. When the requirements are met, process with detailed design
6. Begin production

In order to become knowledgeable on the subject, some extensive reading is required. One general book is Modern Aircraft Design, by Martin Hollmann, who was involved in the design of the Lancair. Another useful book is Design of Light Aircraft, by Richard Hiscocks who was involved in the-design of the Dehavilland Beaver and Otter. Other references are magazine articles from F.AA, the Internet, and other books.

Some necessary-calculations are gross weight, wing sizing, stability in pitch, engine sizing, aircraft performance, selecting an airfoil, vertical tail system, horizontal tail system, specification sheet and layout.

An important item is materials, wood and fabric, metals, composites, their advantages and disadvantages. Joe favours a flying boat type, and has made a scale model with a large beam, which can be in the water without wingtip floats. Interesting flight characteristics of different aircraft configurations were given. Like previous lectures, this was professionally presented, full of detail and interest.

Next, Frank Hofmann undertook the design of a STOL aircraft. Some EAA publications of aircraft design were shown which took the heavy work of calculations out by giving nomographs. After determining the basic requirements such as the number of seats, etc. he then went on to make a comprehensive step by step design analysis of a complete

STOL aircraft, with numbers for wing loading, hp loading, weight of fuel, people, structure, etc., a real 'tour de force'.

Gilles Leger finished off the lecture by describing his Super Chipmunk project. Starting with the use of a Dehavilland Chipmunk wing and using a maximum weight for two persons, the first calculation was a stress analysis of the new centre section. The original tail section conveniently matched the wing. A new steel tube centre section was designed, plus a monocoque aluminium structure between this and the tail section. Gilles being a large person, the cockpit width was increased by 4". A major achievement was the blowing of a distortionless bubble canopy. There is a rollover structure. -The weight so far is 13501bs. The next stage will be the fabric covering of the control surfaces and part of the wing. Gilles' philosophy is to work full time to ensure continuity of details and to get the project finished in the shortest time. Tooling and moulds have already been made, so producing a second aircraft can be accomplished in a shorter time than the prototype. This is shaping up as a fine machine.

Building Glider C-GWKW

By Wolfgang Weichert
(originally written summer of 1979)

It was Leo Schober who got me started in this project. On the thirteenth of October 1974 I accepted Leo's offer to fly his one and only Fauvette. It was a fairly short flight, only thirty minutes, limited by either my little experience at that time or the general soaring conditions of the day. But, being used to a 1-26, I realized how much a higher performance glider can enhance the joys of our sport, particularly if it is your own and therefore available when you want to fly.

From then on I started to think many times of building my own ship. I may have been dreaming or just trying to purposely prepare myself, mentally, for a large long term project. I had to convince myself not of my skills, of which I didn't know which ones would be required, but of my determination and diligence. In the meantime, available literature on the subject was scanned, and information gathered from designers, manufacturers, and peers.

Approximately six months were spent with deliberation, considering metal, wood, performance, kits, price and many more factors, and I had to ascertain my family's approval since a project of this kind has its definite effects on family life. I then made my decision to build the TERN by Terry Miller, and plans were ordered soon after.

While waiting for these, I began to re-arrange my basement workshop, knocking down shelves and building them differently, and using up piles of 2X4's which were bought for that rec room project. The most suitable way to get rid of them was to put them up as walls where the rec room was planned. I learned a lot about space management then, and I have learned a lot more since.

When the plans arrived, a couple of weeks were spent studying them and planning the project. At that time my brother Dieter joined me in the undertaking. It was decided to start with the tail controls, which would get us used to the construction technique. A list of parts was made up for plywood, nuts and bolts etc. and the first order soon went out. In a Manotick hobby shop we selected Sitca spruce for control surface spars and longerons. We spend 2 hours in sub zero weather to select the best Sitca from about 60 boards.

The control surfaces were built on a flat table in a relatively short time and without any problems. They were left uncovered and stored away until inspection. For the fuselage, a 4x20 ft straight table was constructed, reinforced with angle iron. The longerons were cut and spliced. The fuselage side plan was outlined on the 20 ft long table, with wooden blocks nailed to the outline to hold longerons and cross members in correct position. After all side parts were assembled in this form the skin was glued on top. Then we removed the first side, glued all inside gussets to the cross-joints, and repeated the process for the other side.

Next, the two sides were placed vertically on the table and held in this position until the wheel truss and the seat trusses were manufactured, which were then glued between the sides to give the structure some mechanical stability. The tail end behind the wheel truss was then drawn inward in a V-shape and all cross members and gussets were glued in. The forward longerons had to be soaked in wet towels and were slowly curved in, which took several days. The floorboard, instrument deck and the nose former were installed, and that completed the structural part of the fuselage and we removed it from the table. Next the wing pick-ups and top and bottom formers were manufactured and installed. At that point we wrote to MOT Toronto for our fist inspection which was about one year after start of construction.

During the wait for the inspector we spent many evenings and weekends in my employer's machine shop producing all the required metal work, which was then delivered to Les Staples who did the welding for us.

When the inspector arrived, some of the metal work was already painted and installed. The inspection took two hours and everything was O.K.'d for covering. Gluing the skin to the fuselage and controls took little time, and construction of the swings was soon started.

We spent more time on the four wing spars than we had anticipated. The spars were made up of ¾" and 1" thick boards, of which the ¾" boards had to be spliced in the outer quarter of their length. It took me 5 hours every night for a week plus the weekend to prepare the 1:15 splices accurately with a block plane, using a method which Ian Oldacker, another TERN builder of Pinawa, had advised me to use. All boards were then pre-cut to their final V-shape to within ½" on each side of their final dimension. They had to be planed to final size, alternating the sides to prevent any bow in or out. After various futile attempts with power planers, the work was done by hand over a period of several weeks. Next, all spar members were glued together I-beam fashion, and the holes for the wing straps were drilled, bushed, the bushings drilled and reamed on a small drill press and the straps were installed. Working on the wing spars was very time consuming as the handling of parts their size in a congested basement space becomes very difficult.

All wing ribs were cut on a borrowed band saw inside of one week. The spars were arranged in position, supported by four wooden horses, and the wing ribs were assembled and glued to the spars. Some modifications had to be made at this time to accommodate the

Schemp-Hirth type dive brakes, which we had salvaged from Keith Ogilivie's Foka.

In total, it took only about 5 weeks to build the first wing.

Now we were in for a long wait for the inspector, it turned out to be 3 months, and I didn't have enough space to start on the second wing. When we became too impatient, we built four U-shaped hangers and used them to support the uncovered wing from the ceiling joists. This gave us enough space to start the next wing. We were about two weeks into the second wing when the inspector phoned to announce his arrival for the very same evening. So down came the first wing again and, supported by stilts on the spars of the second wing, the inspector took a good look at it and at the ailerons, and signed it all off for covering. We hung one wing up again and proceeded with the second one, covered it after completion, and covered the first wing too.

Now we had to turn to some work with concrete, i.e. cutting a large opening in the basement wall to install a 2 ½ x4 ft window, which consumed a full day. A few weeks later, everything was assembled in the backyard and readied to drill the holes for the wing pick-up bolts. Halfway through this operation it started to rain, which sent us scrambling for plastic covers. We waited a few hours; wings and fuselage well covered, and finally called it a bad day.

A week later we were luckier and were able to complete the drilling and reaming job in 12 hours continuous work.

I spent a lot of time finishing details, the nose was completed in foam and fiberglass (what a smell), the skin joints needed filling and sanding, and painting was the last big job.

So sometime in the summer there was another new ship in Pendleton, and I hoped it justified three years+ of construction and the neglect of a very patient wife and family.

Watch Your Weight!

From November EAA Canadian Council
Rem Walker (Chairman)

As is usually the case, following the annual do at Oshkosh, there are many inquiries about some of the new designs being introduced, or, showing up for the first time. This year was no exception. There have been many requests for information on aircraft such as the Compair 8, Lionheart etc.

Unfortunately, several of the new designs exceed the gross weight limitation *of 3*,968 pounds for Amateur-Built Aircraft under AWM549.Some of the designs exceed that limit by almost 1100 pounds, and one tops the scales at 1232 pounds over Canada' s 3,968 pound limit. There are others that are not quite so popular that go even beyond the figures listed.

If any of your members are contemplating the construction of a recently introduced aircraft I encourage them to check and double-check to make sure they will qualify under Canada's regs. You will find complete details on the Canadian regs in the HANDBOOK that is available, at no cost. from the EAA Canadian Council.

Also, make sure the kit meets the 51% Rule in Canada as some of them are nudging right up to the line with their "quick-build" kits.

Another consideration is that some of the new designs are more than 4-seat aircraft which again exceed the AWM 549 limit of four seats for Canadian homebuilts. Some examples:

• Comp Air 10T	10-place	5800 pounds gross	(Turbine)
• Lionheart	6-7 place	5200 pounds gross	
• Sky Rocket III	6-place	4200 pounds gross	
• Grand 51	2-place	6800 pounds gross	(Turbine)
• MJ-90 (ME109)	1-place	5060 pounds gross	
• MJ-Spitfire	1-place	5060 pounds gross	

There are several aircraft being developed that are beyond the limit by more than a few pounds so be aware of them when they show them at future flying events.

Classifieds

Place your ads by phone with Charles Gregoire @ 828-7493 or e-mail to cbgregoire@sympatico.ca Deadline is first of the month. Ads will run for three months with a renewal option of two more months.

For Sale/Trade
- Continental C90-12 with logs for sale or trade for Lycoming O-320 (may consider O-290D or D2)
- Vacuum pump and drive for Continental O-200.
- Pair of new 500X5 Rosenhan wheels, brakes and tires.
- Some 4x8 sheets 1/16 & 3/32 aircraft plywood
Lionel Robidoux 613-738-1066 01/2000

Homebuilt glider for sale, Miller Tern C-GWKW. Wood construction, amateur built in 1978. Aircraft has always been hangared at Pendleton. No accidents. Total Time 845 hrs. L/D 34:1 $6500
Juergen Weichert (613) 746-7685
juergen@accolade.ca
More information at http://accolade.ca/glider 10/99

Charless Parts Bin

ASA Tri-fold Knee board $40 obo
New SCAT Hosing, 3dia. $8/ft
Old tachometer and cable off C150M $35 obo
Cessna Clock $35 obo
Charles Gregoire 613-828-7493 11/98

Tims Parts Bin

Cessna 140 exhaust system complete $500.00
Cessna 140 engine baffles $50.00
MS24566-4B pulley NEW $8.00ea.,
Large HF radio (ex Otter), good ham project $25.00, Large Radar Screen (possible coffee table???) $25.00, Beech 18 oil cooler, new (possible rad??) $50.00, 6 Gal. J-3 wing Tanks (2) $200.00, Box of VW engine Parts (possible 1/2 vw project) $50.00, New autopilot , 12 volt trim servos and stuff $25.00, Air Path and Pioneer 3 1/8 compass cores $75.00/ea, Shark Fin pitot tube 24volt, new in box $25.00, Beaver U/L Lotus float rigging (spreader bars, etc.) $25.00, Continental prop. spacer (O.E.M. alum) $50.00
Tim Robinson 613-824-5044 03/98
75714.2136@compuserve.com

McCauley Metal Prop, 70-38 for a continental A65 or C85.
Jim Robinson 613-830-4317 01/98

Garry's Parts Bin

50 ft. 1/8" galvanized aircraft control cable, 7x19, MIL-W83420D
Dynafocal engine mount
Wheel pants $100.00
Oil, break-in, 12 litres, Shell, Esso
Wing Tip Nav Lights
NACA air inlets
Elevator trim assembly
Primer
Valves, Fuel selector
Valve, Parking brake
Accelerometer (G-meter) 2.25 inch
Oil cooler - Continental 6cyl.
CHT guage and probe
Lycoming, Accesory case, dual take-off adapter for hydraulic and vacuum pumps.
Piston rings for Continental E-185 or O-470.
Light weight starter & bracket for Lycoming O320 or O360.
two Lycoming engine-driven fuel pumps $50.00 each

Control wheel yoke assembly from Piper Tomahawk

Engine, VW 1600cc completely rebuilt
Garry Fancy (613)-836-2829 01/98

Articles Wanted

I am always interested in receiving submissions for this, your, Newsletter. You may bring articles to the monthly meetings or mail information to the post office box or send me an e-mail attachment at:

cbg@nortelnetworks.com 01/2000

EAA Chapter 245 Membership Application

NEW:___ RENEWAL:___ DATE:__/__/__
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Annual Dues: January 1st to December 31st. (porated after March31st for new members/subscribers).
Associate Member ____: $30.00 Newsletter plus Chapter facilities
Full Member: ____: $55.00 Newsletter, hangar, workshop, tiedowns
Newsletter subscriber ____: $30.00 Newsletter
Note Associate and full members must also be members of EAA's parent body in Oshkosh WI, USA

Make cheque payable to:
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