



CORBEN COURIER

Published for the members of the Experimental Aircraft Association, Chapter 93, Madison, Wisconsin
September 2007

The Chapter 93 monthly meeting will be held at **7:00, Thursday, September 20**, at the Chapter clubroom, Blackhawk Field, Cottage Grove, WI. Member **Jack Jerred** will tell us a little bit about his life and of some of his experiences during the time he was in the military during WW II. We want to hear more about the lives of our members and haven't had this kind of presentation since **Neil Robinson** so interestingly told us about himself.

THE GIMLI GLIDER INCIDENT

From an article published in Soaring Magazine by Wade H. Nelson

If a Boeing 767 runs out of fuel at 41,000 feet, what do you have? Answer: A 132-ton glider with a sink rate of more than 2,000 feet-per-minute and marginally enough hydraulic pressure to control the ailerons, elevator, and rudder. Put veteran pilots Bob Pearson and cool-as-a-cucumber Maurice Quintal in the cockpit and you've got the unbelievable but true story of Air Canada Flight 143, known ever since as the Gimli Glider.

Flight 143's problems began on the ground in Montreal. A computer known as the Fuel Quantity Information System Processor manages the entire 767 fuel loading process. The FQIS controls all of the fuel pumps and drives all the 767's fuel gauges. Little is left for crew and refuelers to do but hook up the hoses and dial in the desired fuel load. But the FQIS was not working properly on Flight 143. The fault was later discovered to be a poorly soldered sensor. A highly improbable, one-in-a-million sequence of mistakes by Air Canada technicians investigating the problem defeated several layers of redundancy built into the system. This left Aircraft #604 without working fuel gauges.

In order to make their flight from Montreal to Ottawa and on to Edmonton, Flight 143's maintenance crew resorted to calculating the 767's fuel load by hand. This was done using a procedure known as dripping the tanks. "Dripping" could be compared to calculating the amount of oil in a car based on the dipstick reading. Among other things, the specific gravity of jet fuel is needed to make the proper drip calculations.

The flight crew had never been trained how to perform the drip calculations. To be safe, they re-ran the numbers three times to be absolutely, positively sure the refuelers hadn't made any mistakes, each time using 1.77 pounds/liter as the specific gravity factor. This was the factor written on the refueler's slip and used on all of the other planes in Air Canada's fleet. The factor the refuelers and the crew should have used on the brand new, all-metric 767 was .8 kg/liter of kerosene.

After a brief hop, Flight 143 landed in Ottawa. To be completely safe, Pearson insisted on having the 767 re-dripped. The refuelers reported the plane as having

11,430 liters of fuel contained in the two wing tanks. Pearson and Quintal, again using the same incorrect factor used in Montreal, calculated they had 20,400 kilos of fuel on board. In fact, they left for Ottawa with only 9,144 kilos, roughly half what would be needed to reach Edmonton.

Lacking real fuel gauges, Quintal and Pearson manually keyed 20,400 into the 767's flight management computer. The flight management computer kept rough track of the amount of fuel remaining by subtracting the amount of fuel burned from the amount (they believed) they had started with. Their fate was now sealed.

According to Pearson, the crew and passengers had just finished dinner when the first warning light came on. Flight 143 was outbound over Red Lake, Ontario, at 41,000 feet and 469 knots at the time. The 767's Engine Indicator and Crew Alerting System beeped four times in quick succession, alerting them to a fuel pressure problem. "At that point," Pearson says, "we believed we had a failed fuel pump in the left wing, and switched it off. We also considered the possibility we were having some kind of a computer problem. Our flight management computer showed more than adequate fuel remaining for the



duration of the flight. We'd made fuel checks at two waypoints and had no other indications of a fuel shortage." When a second fuel pressure warning light came on, Pearson felt it was too much of a coincidence and made a decision to divert to Winnipeg. Flight 143 requested an emergency clearance and began a gradual descent to 28,000. Says Pearson, "Circumstances then began to build fairly rapidly." The other left wing pressure gauge lit up and the 767's left engine quickly flamed out. The crew tried crossfeeding the tanks, initially suspecting a pump failure.

Pearson and Quintal immediately began making preparations for a one-engine landing. Then another fuel light lit up. Two minutes later, just as preparations were being completed, the EICAS issued a sharp bong – indicating the complete and total loss of both engines. Says Quintal, "It's a sound that Bob and I had never heard before. It's not in the simulator." After the "bong", things got quiet. Real quiet. Starved of fuel, both Pratt & Whitney engines had flamed out. Pearson's response, recorded on the cockpit voice recorder was "Oh, F---."

At 1:21 GMT, the forty million dollar, state-of-the-art Boeing 767 had become a glider. The APU, designed to supply electrical and pneumatic power under emergency conditions was no help because it drank from the same fuel tanks as the main engines. Approaching 28,000 feet, the 767's cockpit went dark. Pilot Bob Pearson was left with a radio and standby instruments, noticeably lacking a vertical speed indicator – the glider pilot's instrument of choice. Hydraulic pressure was falling fast and the plane's controls were quickly becoming inoperative. But the engineers at Boeing had foreseen even this most unlikely of scenarios and provided one last failsafe – the RAT.

The RAT is the Ram Air Turbine, a propeller driven hydraulic pump tucked under the belly of the 767. The RAT can supply just enough hydraulic pressure to move the control surfaces and enable a dead-stick landing. The loss of both engines caused the RAT to automatically drop into the airstream and begin supplying hydraulic pressure.

As Pearson began gliding the big bird, Quintal "got busy" in the manuals, looking for procedures for dealing with the loss of both engines. There were none. Neither he nor Pearson nor any other 767 pilot had ever been trained on this contingency. Pearson reports he was thinking, "I wonder how it's all going to turn out." Controllers in Winnipeg began suggesting alternate landing spots, but none of the airports suggested, including Gimli, had the emergency equipment Flight 143 would need for a crash landing. The 767's radar transponder had gone dark leaving controllers in Winnipeg using a cardboard ruler on the radar screen to try and determine the 767's location and rate of descent.

Pearson glided the 767 at 220 knots, his best guess as to the optimum airspeed. There was nothing in the manual about minimum sink – Boeing never expected anyone to try and glide one of its jet airliners. The windmilling engine fans were creating enormous drag, giving the 767 a sink rate of somewhere between 2,000 and 2,500 fpm. Copilot Quintal began making glide-slope calculations to see if they'd make Winnipeg. The 767 had lost 5,000 feet of altitude over the prior 10 nautical (11 statute) miles, giving a glide ratio of approximately 11:1. ATC controllers and Quintal both calculated that Winnipeg was going to be too far a glide, the 767 was sinking too fast. "We're not going to make Winnipeg," he told Pearson. Pearson trusted Quintal and immediately turned north.

Only Gimli, the site of an abandoned Royal Canadian Air Force Base remained as a possible landing spot. It was 12 miles away. It wasn't in Air Canada's equivalent of Jeppesen manuals, but Quintal was familiar with it because he'd been stationed there in the service. Unknown to him and the controllers in Winnipeg, Runway 32L (left) of Gimli's twin 6,800-foot runways had become inactive and was now used for auto racing. A steel guard rail had been installed down most of the southeastern portion of 32L, dividing it into a two lane dragstrip. This was the runway Pearson would ultimately try to land on, courting tragedy of epic proportions.

(to be continued)

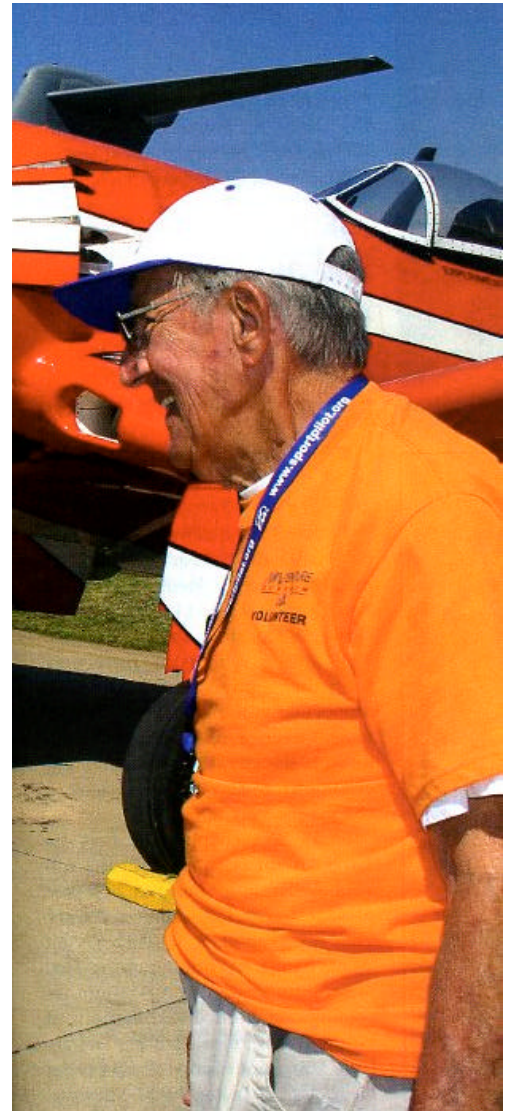
FRED GETS HIS DUE

Our beloved member, Fred Leidel (on the right), was featured in the September 2007 issue of Sport Aviation in a story well-written by a friend of our chapter, Rose Dorsey. In it, Fred is recognized as the oldest EAA volunteer at this year's AirVenture, serving as a member of the POP (Protect Our Planes) operation.

(Photo from Sport Aviation, Sept. 2007)

BOOK REVIEW

The Aviation Legacy of Henry & Edsel Ford by Timothy J. O'Callaghan, 2000, Proctor Publications, 198 pages, hard cover, plus a good table of contents and index, hundreds of photographs. I bought this book at AirVenture 2007, thinking it would provide good background knowledge for the next time we sponsor the Ford Tri-motor. It was much more. What a list of firsts: The first lighter-than-air airship with an all-metal gas envelope; the first concrete runway,



the first air tours (leading to the National Air Races at Cleveland and later at Reno), the first passenger airline. Ford made many aircraft and aircraft related things besides the Tri-motor. Example: 8,685 B-24 bombers, many at the rate of one each hour; Liberty and Pratt and Whitney engines (their efforts spanned both World Wars); Waco gliders; engines for the “Kettering Bug”, a WW II winged predecessor to the German WW II Buzz Bomb; his own dirigible mooring mast; an aircraft factory with the largest room in the world.

There are interactions with famous people, such as Charles Lindbergh and Richard Byrd. There is all the effort to preserve the legacy by establishing the Ford Museum and Greenfield Village.*

It is a fascinating book, well worth reading. I finished it four days after arriving home from Oshkosh – that attests to my interest.

Fred Leidel

*Note: Ford’s long and continuing involvement in aircraft and safety in flying makes it quite logical for the Ford Motor Company to be one of the major sponsors of Air Venture.

CHAPTER PUBLICITY

In the Monday, August 27 issue of the Wisconsin State Journal, there was a very nice story involving Young Eagle rides at our Brat and Bean outing on August 26, including three photos, especially the great one of pilot member Wil Bremer in flight. There were also some cogent quotes from members Larry Landucci and Jim Falk.

AIRCRAFT IDENTIFICATION



The name of this month’s airplane is Pin Ball and it took 8,000 feet of runway to get airborne. It also had a 1-1/2” laminated windshield and 1,000 pounds of armor. Who manufactured it, what was its numerical designation, and what was its mission?

SECRETARY’S REPORT

Chapter 93 Membership Meeting, August 16, 2007

The Chapter building roof has been leaking for some time and a motion was made to get quotes to have it repaired. The motion was seconded and passed. If the roof could be repaired for \$500 or less, it was put into a motion to have it fixed immediately without having it come back to the members for approval, which was also seconded and passed.

Gary Chenier asked for volunteers to be on the Nominating Committee; Jim Falk and Jerry Matzelle volunteered for the positions. October meeting will have nominations from the floor for Chapter officers. The November meeting will be the election of the officers, and the December meeting will be the induction of the elected officers.

A thank-you note was read from Devin Turner at the Chapter meeting.

Mark your calendars for the next Chapter event on December 1st, the Chili Fly-in.

Don Ripp won the meeting door prize of a video tape donated by Bud Rogers.

Earl Martin

PRESIDENT’S REPORT

After all the rain earlier in the week, the weather cleared and we had a perfect day for our fly-in. Our “new” tent worked out great. However, Bud Rogers feels we need to have a knot tying class at one of our winter meetings. Other than some soft areas in the grass parking, it was a great fly-in with approximately 30 airplanes in attendance. We even had a couple of unusual planes stop by – a Fairchild and a Grumman Ag Cat. All the food was sold, we had several Young Eagle flights, and we even signed up some new members. Thanks to the generosity of Larry Landucci and Wil Bremer, we got some great publicity in the local paper. Thanks to all the hard working volunteers who made it a successful event!

I know summer is over because the order form for the EAA calendars arrived this week. We will start taking advanced orders at this month’s meeting. Remember, the Nominating Committee will be announcing its slate of candidates for the Chapter election. If you haven’t been contacted but wish to serve, please let a Board member know.

Fly safely!

Gary Chenier

PATTY PLANTZ ON THE BRAT & BEAN

Thought you would be interested to know that we made a profit of \$469.56 on the Brat & Bean event. Assuming I have received all requests for reimbursement of expenses, the total for expenses was \$221.44 (food only). Total money deposited for

income at the event was \$691. Now that the Chapter owns a tent, the event actually generates income! Thanks to everyone who was involved in getting the tent – especially the anonymous donor of funds.

Perhaps due to the nice article of the event in the paper, we received a donation of \$95 to use for advertising future Young Eagle events. The donation was made by the Cub Scout group from Oregon that came to the June event at Blackhawk. There was a very nice thank-you note that came with the donation check. I will bring the note to the next meeting.

Enjoy the break in the hot weather. Cool feels great!

Patty Plantz

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- 5) New Spinner. 10" with back plate. \$ 130
- 6) Technical Counselor Visit. One cup of coffee.

Call Bill Rewey—608-833-5839

CHAPTER OFFICERS

President—Gary Chenier, 3702 Rebel Dr., DeForest, WI 53532, 608-837-2557, aviation@inxpress.net

Vice President—Don Ripp, 213 4th St., Waunakee, WI 53597, 608-849-7543, donripp@hotmail.com

Secretary—Earl Martin, 1725 Linnerud Dr. #207, Sun Prairie, WI 53590-3620, earlpmartin@excite.com

Treasurer—Patty Plantz, 922 Lawrence Drive, Madison, WI 53715, 608-251-6912, cruzair@sbcglobal.net

Membership—Dick Hartwig, 6477 Hickory Lane, Waunakee, WI 53597, 608-575-6925, rhartwig11@juno.com

Newsletter—Jack Jerred, 6110 East Gate Rd., Monona, WI 53716, 608-222-2770, chetnalma@charter.net

EAA Chapter 93 publishes *Corben Courier* once a month for and about its members who are interested in all phases of aviation. Articles to be submitted must reach the editor by the first Saturday of the month. Meeting night is the third Thursday of the month unless otherwise stated. Members may advertise items free of charge. Business card size ads are \$5 per month or \$50 per year.

Disclaimer: The *Corben Courier* newsletter serves as a clearinghouse of ideas and suggestions for homebuilt aircraft and owner operated aircraft. No responsibility or liability is assumed, expressed, or implied for the suitability, accuracy, or approval of any information contained in this newsletter. Any parties using suggestions or ideas expressed herein do so at their own risk without recourse against anyone.