

Jabiru Landing Incident 19 July 2010 Lancair VH-YFM

Brief History and Recovery Activity Log

Prepared by Fred Moreno 8 August 2010 from notes taken during the recovery

Prelude

The objective of the trip was to deliver an SAAA Maintenance Procedures Course to SAAA Chap 35 members in Darwin via the volunteer SAAA instructors. To justify costs, a decision was made to make a vacation/sightseeing trip with the course in the middle on the weekend of 17-18 July.

Wednesday 14 July, Fred Moreno (course instructor), Chris Howden, and Noel Stoney (course coordinator and SAAA Chap. 13 President) left Denmark, stopped at Geraldton for fuel, and continued to Coral Bay to spend the night. Thursday, we flew to Karratha and spent the night at Broome. Friday we flew to Halls Creek, Kununurra, and stopped for the weekend at Darwin. Accommodations in Darwin were booked for Fri-Sat-Sun-Mon with a planned Tuesday departure. In Darwin we met course instructor and SAAA National Council Member (Communications) Shirley Harding who stayed with Vern and Jenny Taylor. Vern is SAAA Chapter 35 President and our host for the course.

Course was completed on Sunday. Some students advised that they carried registered firearms in their aircraft because one could make a successful forced landing in the area, but then not survive the walk out. Hmmm...

Monday morning Fred, Noel, Chris and Shirley departed Darwin for a stop at Cooida and then a sightseeing circuit around Kakadu National Park while returning to Darwin.



Kakadu croc eats 3 meter shark the day before our visit. More hmmm....

Approximately 20 minutes into the flight at 8 NM from Jabiru airport, one cylinder failed due to exhaust rocker arm failure. (Review of engine monitor records showed that the blowback from cylinder no. 1 took down cylinder no. 6 due to flooding. Cylinder number 6 was brought back online by adjustment of mixture but roughness continued.) On approach to Jabiru while flaring to land, power was added, the engine failed completely (probably due to flooding from fuel from the failed cylinder going to other cylinders plus going to full rich on final), the flare was not completed, nose wheel struck, nose landing gear failed, and the aircraft slid on the nose while rolling on the main gear. No injuries occurred. Airport personnel, QBE, CASA, and ATSB were notified, and the aircraft was recovered from the side of the runway to a gravel area near the terminal.

Jenny Taylor drove from Darwin, retrieved the four of us, and returned us to Darwin. Noel, Chris and Fred stayed in previously booked accommodations. Shirley missed her Qantas flight (it

was insured), and spent the night with Vern and Jenny. It was agreed that Noel and Shirley would return via airlines (cheapest fare would be Wednesday departure), and Chris and Fred would remain to complete the aircraft recovery.

Tuesday 20 July

Because I had transported the Lancair IV partially built from the US to Australia, I elected to use the same method of transport via a “high cube” 40 foot shipping container. I spent most of the morning contacting shipping companies to find one that could handle transport back to Denmark Airport on a turnkey basis and succeeded with NQX. A quotation was solicited and received, and preliminary arrangements made to have the container taken to Jabiru Airport and off loaded to the ground via side loader trailer the following Saturday. I then arranged to rent a dual cab pickup truck which would be available through Saturday evening and have it delivered to our place of accommodation. I also coordinated our plans with Rob at Kakadu Air Services in Jabiru via phone. The Kadadu Air personnel proved to be great hosts and were immensely helpful.

We managed to extend our stay at our Darwin accommodation an additional day. Shirley spent another night with Vern and Jenny. That evening, the four of us that were participants in the landing incident worked to prepare the required ATSB written report which was submitted via Internet.

During the weekend class one of the students attending was Bill Markey a LAME who is a specialist in aircraft remote area repair, rectification and recovery. Bill travels via an RV4 fully loaded with tools and supplies. I called Bill and arranged for him to meet us at Jabiru Thursday to help remove the wings and prep the aircraft for shipment. We also arranged to pick up a 44 gallon drum from Bill’s home which would be used to hold a portion of the fuel still in YFM.

We also had the challenge of getting accommodation in Jabiru during the height of the tourist season. We ultimately succeeded but had to hop from place to place grabbing cancellations as they appeared.

Chris, Fred, and Noel drove to Vern’s house to get Shirley and then transport Noel and Shirley to the Darwin Airport. We borrowed tools, water jugs, a 40 liter fuel drum and 20 liter jerry can from Vern and Jenny to receive fuel to be drained from YFM.

We then drove to Bunnings and made the first of two stops for tools, supplies, and materials. Our discussion with the folks at Kakadu Air Services at Jabiru indicated that there was nothing in the way of supplies or tools at Jabiru – no hardware store, nothing. Everything would have to be imported. Based on sketches of the fuselage and wing supports I prepared the previous evening, we procured timber, plywood, nuts, bolts, screws, adhesives and other materials and tools required to disassemble the aircraft and construct the necessary support stands. Additionally, we stopped at a rubber shop to buy a sheet of shock absorbing rubber foam and adhesive to attach it to the wing supports and fuselage cradle. We stayed one extra night in Darwin. Total labour for Chris and Fred with recovery preparation in Darwin: 7 hour each, total labour time 14 hours.

Recovery Challenges

Conventional recovery of Piper/Cessna etc. is accomplished in the Darwin area by removal of horizontal stabilizer and wings, and lifting of these items and fuselage onto a specially fabricated fuselage/wing/tail carrier available for rent. It is designed to handle up to 200 series Cessna aircraft.

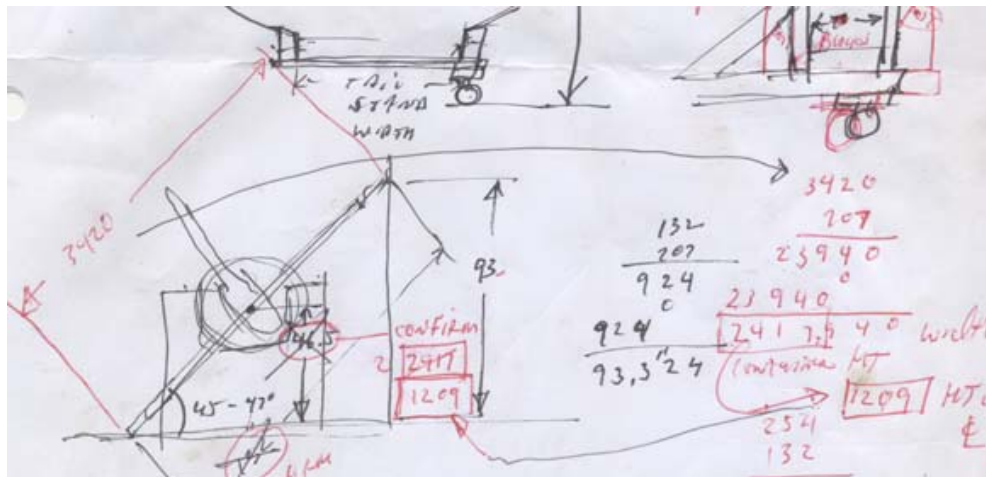
The challenge with the Lancair IV is that the horizontal stabilizer is carbon fiber honeycomb and epoxy construction permanently bonded to the fuselage and vertical stabilizer to make a single piece structure. The tail is 3420 mm wide. This is far in excess of legal road width (2440 mm) and would require special permitting for road travel, permits we were unlikely to obtain given the distance and travel required on heavily-trafficked main highways.

Transport required that the fuselage be rotated to an angle of about 48 degrees to permit the horizontal stabilizer to fit through the door of a 40 foot "high cube" container. This in turn required construction of a fuselage carrier/cart that would permit the fuselage to be rolled into the container, rotated 48 degrees, and the tail height to be carefully adjusted to allow passage through the container door with about 30-40 mm of total clearance. These requirements are illustrated in the photo below taken during unloading.



Fuselage in container with cart

The fuselage cart had to be designed from memory and modified for reinforcement to reflect the shipping weight with engine attached and fuselage full. One of the drawings is shown below.



Find the error.....

Wednesday July 21 (continued)

After dropping Noel and Shirley at the Darwin airport, Chris and Fred drove to Bill Markey's home about 50 km south of Darwin, picked up the 44 gallon fuel drum, and made final arrangements with Bill's assistance on Thursday. We then drove on to Jabiru airport arriving at 2:30 pm and met with the Chief Pilot Rob of Kakadu Scenic Air Tours to make arrangements for recovery. We were

offered assistance and allowed to build the wing saddles and fuselage cart in the hangar, but due to CASA requirements that prohibit aircraft maintenance in the hangar (licensed for storage only), we could not move the aircraft to the hangar, but would have to do our work in the dirt area about 100 meters from the terminal alongside the tarmac.

The truck (filled inside and out with timber, tools, supplies, baggage, water jugs, and food/drinks collected along the way) was unloaded in the hangar and the area prepared for fabrication of the necessary jigs and cart and the four wing saddles to receive the wings once removed.



Fabrication Area

We then moved to the aircraft, set up a sun shade over the cockpit (being from cool Denmark/Albany area, the tropical heat was an issue for our elderly bodies), and removed the interior. The seats, panels and baggage were transported to the hangar. We drained approximately 250 liters of fuel into the 44 gallon drum, 40 liter drum, and 20 liter jerry can. We also began wing removal by starting disassembly of wires, linkages, cables, etc. Work stopped due to darkness, about 6 PM. Preparation, travel, and work time was nominally 10 hours each for Chris and Fred. Total labour time 20 hours. Total travel time Darwin, pick up fuel drum, then to Jabiru: 3 hours for a total of 6 travel hours for Chris and Fred

The only first night booking available was at Kakadu Aurora about forty minutes outside of Jabiru.

Thursday July 22

Arriving Jabiru at 8:00 AM we completed preparation for wing removal and finished and positioned the wing stands. Bill Markey arrived at 9:00 AM and helped with the final disconnect of the wings, wing removal, and installation of wings into the wing saddles.



Wings in saddles

The fuselage nose was raised and pallet stack underneath removed to make lower firewall and cowl area accessible. The nose was supported with a single pallet on edge under the nose of the crankshaft.

The lower cowl was removed and aircraft carefully inspected for an initial damage assessment. Bill Markey noted the damaged valve cover on cylinder no. 6, removed the cover and discovered the broken exhaust rocker arm. A small hole knocked into the bottom of the rocker cover was the source of the oil on the firewall and spread along the belly. Bill Markey completed five hours of chargeable work and inspection activities, made recommendations, and then departed to prepare for another recovery of an aircraft in Arnhem Land. Chris and Fred began fabrication work on the fuselage cart.

Breakfast and lunch were via the tucker bag we had stocked. Work was completed about 6:00 pm for a total of ten hours each. Total labour time: 20 hours. The second and third nights were spent at the Gagudju Crocodile hotel. We had dinner there the first night, and at the Jabiru Sports and Social Club the second night (much less expensive!)

Friday July 23

The entire day was consumed with construction of the fuselage cart. It became clear that we would not make our Saturday afternoon deadline for container loading, so the container was rescheduled for Sunday at noon.

The fuselage cart was fairly involved in its construction because of requirements to carry the fuselage fully loaded with engine, rotate fuselage to 48 degrees, precision adjustment of tail elevation to pass through the container door, and requirement that the cart could roll into and out of the container. The following photos show details of the fuselage cart after being removed from under the aircraft post-delivery in Denmark. Work completed this day was about ten hours. Breakfast and lunch were via the tucker bag. Much water and orange juice were drunk. Labour time 10 hours for Chris and Fred, total of 20 hours.



Front of fuselage stand, level and rear side rotated



Fuselage stand front rotated and with rear side with rotator cradle removed



Foam padding on rotator cradle



Fuselage tail stand with vertical adjustment, vertical and rotated positions



Back side of rear fuselage stand rotated, and rotator cradle removed

Saturday July 24

We arrived at 7:00 AM to be assured of having enough daylight to complete necessary tasks. The construction of the fuselage cart was completed, and the cart moved to the airplane for installation. Using a fork lift to lift the nose, the stand was disassembled into forward and rear sections, slipped under the fuselage, reassembled, and then the nose dropped into the forward cradle. The fork lift was then moved to the tail, and lifting via two large plywood and foam fixtures which had been prepared, the forklift was used to raise the horizontal stabilizer and rear of the fuselage sufficient to gain clearance for the main landing gear to be retracted while clearing the ground and the cart. The tail was then lowered and the rear of the fuselage settled into rear portion of the fuselage cart.

We got a call from the truck rental company stating that we had to return the truck that evening as originally scheduled as it had been rented for two weeks starting the following day. We negotiated for the company to meet Chris with a smaller replacement truck half way to Jabiru at Bark Hut where trucks would be exchanged. Chris returned about three hours after departing, and rejoined the construction work.

We returned to the hangar and fabricated a set of support blocks to slip under the fuselage cart once it was inserted in the container. The support blocks would lift the cart off of the caster wheels. The blocks would be bolted to the cart and screwed to the floor of the container. A plywood stack with round hole in the center was cut and assembled to slip over the front of the propeller hub and fitted with a layer of foam on the front to make a "front bumper" to carry any braking loads from the fuselage into the container front wall if the truck had to make an emergency stop.

Departure was at 5:00 pm, 10 hours of work accomplished, breakfast and lunch via tucker bag. Total labour time for the day: 20 hours.

Sunday, July 25

We fabricated plywood "pavers" upon which we could elevate the fuselage cart to the floor elevation of the container (150 mm off ground level) and roll it into the container when it arrived. The fork lift was again used to raise the fuselage nose. The cart was raised by hand with help from our friends at Kakadu Air, and a pallet and the plywood paving inserted under the cart caster wheels. Packing was partially completed with all remaining tools and materials and aircraft parts mounted on pallets or packed in cardboard boxes.

The container arrived at 12:00 and the process of moving the cart into the container commenced with great difficulty due to the weight of the fuselage and engine, and tendency of the steel caster wheels to sink into the plywood and run off the "tracks." The front was rolled into the container, and difficulties were encountered with the tail. A miscalculation left the tail at the wrong elevation. The rear steel casters were removed from the cart, blocks of plywood fabricated and inserted and wheels reattached to obtain the correct height for tail entry to the container. Then the fuselage jammed in the rotator cradles and would not rotate to the final correct angle (plus and minus better than one degree accuracy required to get through the container door). Much cursing, levering, jacking, and fabrication of more load blocks, fulcrum points, and other work succeeded in getting the fuselage rotated and the cart installed fully forward in the container. Temperature was 35C outside, in the container estimated at 55C, and the west container wall bathed in tropical sunlight was probably 70C as it raised skin burns when touched.

Once fully inserted, the cart was raised off its wheels, put on support blocks, and the blocks were bolted to the floor and to the cart. The cart was also secured with ropes tied to rings in the container. Wings were loaded on their cradles and these were screwed to the floor of the container. Other parts, bottom cowl, boxes, and baggage were inserted, secured, container doors locked, and the container closed at 5:30 pm and sent on its way.

We returned to the hangar, cleaned up, swept up, and hauled waste and debris to the local tip which is open 24 hours. We then drove back to Bill Markey's home, returned the 44 gallon drum, and then drove on to Darwin to spend the night with our hosts Vern and Jenny Taylor in arriving late that evening. Total recovery time at the airport was 7:00 am to 6:00 pm, 11 hours. Breakfast and lunch were via our nearly depleted tucker bag. Chris and Fred each drank eight liters of water and juice during the day and while driving back to Darwin. Total labour time for day: 22 hours. Total travel time: 3 hours to return drum and to Darwin, 6 hours travel time total.

Monday July 25

We had breakfast with our hosts and returned the tools, supplies, jerry can, fuel drum, water jugs, and other goods we had borrowed. We gave our hosts the shade awning that had covered the fuselage while we worked on it at Jabiru, and also gave them some tools and surplus supplies we had purchased to partially thank them for retrieving us from Jabiru earlier in the week plus their hospitality.

Qantas tickets had been procured earlier in the week to get discount rates, and Chris and Fred returned to Perth and were picked up by Elgar and Bo Hannington (SAAA Chapter 16, Serpentine). We spent Monday evening with Bo and Elgar, and then Tuesday morning Elgar drove us to Arthur River, half way from Perth to Denmark where we were met by Noel Stoney who drove us the rest of the way home.

Saturday, 31 July.

The container arrived about noon and with the help of about a dozen aviation friends YFM was extracted from the container, returned to hangar, and put up on jacks and stands. The cart and wing stands were removed, sawed into manageable pieces, and taken to the tip. Recovery completed. Parts were ordered. Repairs were soon to be started.



Fuselage cart about to go to tip

Summary of travel time for Chris and Fred: 12 hours

Summary of labour time dedicated to recovery, Chris and Fred: 116 hours