Oshkosh '88
A Crash 'N Success

Marcus P. Borom

The story I am about to tell is remarkable from two standpoints, which I will cover in chronological order. The Experimental Aircraft Association Convention held in Oshkosh, WI each year is a Mecca for aviation enthusiasts and a challenge of aviation skills for the 10,000 or so pilots who have to negotiate arrivals and departures in the most congested air traffic in the world during the one week of the show. Not all arrivals are successful.

I had a warm feeling about my Long-EZ which had performed flawlessly on its first long, cross-country flight from Schenectady, NY, to Oshkosh, WI. I was looking forward to having "Daedalus II" graze in its strange, nose-down attitude with many others of its kind at this traditional watering hole for homebuilt, composite aircraft designed by Burt Rutan. But that was not to be.

It was Thursday afternoon - one day before the convention was to begin. The air traffic was extremely heavy. The air traffic controller at the outlying check point at Fisk (a difficult-to-spot cross-road along the railroad track leading out of Ripon, WI) had elected to forego the 500 ft vertical separation between 100 mph and 150 mph aircraft and was requiring that all inbound aircraft fly at the same altitude - an incredibly bad decision. I found it necessary to depart the inbound trail of slow flying metal twice in an attempt to achieve a comfortable separation. With radio communications being one way only from the controller, it was imperative to know when one's aircraft was directly over Fisk. The controller would identify aircraft over Fisk by type and sometimes color and trim and ask for confirmation of identification by having the pilot waggle the wings. With Fisk poorly identified, the request for wing waggling would be answered by several planes of the same type in the trail. Each waggler was confident that instructions had been received to proceed.

Each aircraft cleared past Fisk was assigned to the tower frequency of 118.5 for further instructions as the trail continued on a right hand pattern for runway 27 (two-seven). As I passed beyond Whitman Field off to my right, I received the message from the tower, "Long-EZ with flashing strobes depart the pattern and enter a right base for runway 18 (one-eight)." I was delighted to get out of that congestion. On banking right to enter a right base for 18, I was further pleased to note that there was no other traffic ahead or below me. Another right bank set me up on a perfect final approach to runway 18 which also happens to be the main airshow runway and it was lined with thousands of spectators. The switch from a westerly runway to a southerly runway introduced the factor of a 90 deg. crosswind, but the winds were not severe and were of no major concern.

About 1/2 mile from touchdown and cleared to land, I was notified by the tower to switch to another frequency. Fooling around with radios on final is not a standard procedure, but I punched in the new numbers. I was thinking how fortunate I was to have been peeled out of all that congestion and set up as the first and only plane to land on 18 at this time. Since I had deployed my nose gear and landing brake much earlier in an attempt to lower my pattern speed, there was nothing to do but set her down on the main gear and cruise to a stop under the direction of the guys with the ping-pong paddles.

Then it happened! Daedalus II was fifteen feet above the ground and cruising in for a fly-down at around 80 knots (92 mph). Out of nowhere, directly below me and a little to the right appeared a stagger-wing-canard homebuilt - it was a white either Quickie-2 or Dragonfly. What it was specifically was not important. What could happen in the next few moments was definitely important. In the milliseconds that followed, my mind proposed and rejected at least two options. Rejection no. 1: continuing on approach as set up would result in two planes landing in the same place at the same time with disastrous results. The tractor prop of the stagger-wing canard would sever my legs and the pusher prop of my Long-EZ would auger into the backs of the occupants below. Rejection no. 2: powering up and climbing out over the stagger-wing canard would very likely result in my main gear hanging up in their rear upper wing and throwing me forward into their cockpit and prop - once again with the same disastrous results.

I elected to pull up and bank to the left in, admittedly, a somewhat startled state but without any sensation of fear. I cleared the plane beneath me which continued unconcernedly on for a successful landing. (In retrospect, I believe that the pilot of the other plane never saw me. My blind spot is below and his is to the rear. He probably was slightly below and ahead of me and had drifted left in the crosswind.) The next events were abrupt, rapid-fire and definitely cacophonic. I was so close to the ground that my left lower winglet contacted the runway.

Daedalus II lurched forward like a running gazelle pierced with a 300 Magnum. The nose gear took a sharp side load and snapped at the pivot casting. The nose wheel and fork detached and ricocheted back toward the prop. The deployed landing brake intercepted the nose wheel like a skillful goalie and deflected it clear of the prop and engine. The plane continued stumbling to the right and caught the right wingtip on the runway. Daedalus II lurched back to a horizontal attitude and continued screaming down the runway grinding away the gearless nose as I tried valiantly to brake and maintain straight forward motion.

The aircraft by this time had moved too close to the left edge of the runway. The low riding canard sheared off a runway light and veered the craft out into the turf sending dirt and divots flying in all directions. The nose must have dropped into a chuck hole since the plane made an abrupt 180 deg. pivot and came to a halt.

Still conscious and unhurt except for a bruised wrist - the first remarkable part of this story - I opened the canopy and waved my arms at the troop of fire engines and emergency vehicles and personnel that were descending on me out of nowhere. The personnel and volunteers were very accommodating and consoling. Every piece and stick of scattered airplane parts were collected and returned to the plane - an important factor in the events to follow.

Volunteers from an Iowa chapter of the EAA staffing the Emergency Airplane Repair Area arranged to tow the craft off the field and to the repair area. Unfortunately, the tow path led for a mile directly in front of the show crowd with me in the lead car.

The Emergency Repair Area was a grass plot roped off to keep the curious out. The plot held three other crashes that had preceded mine earlier in the day. There was a small shack containing a field workshop boasting a vice, drill press, arbor press, various saws and wrenches, other tools and a limited supply of materials for the use of the afflicted. The most important resource, however, was the volunteer personnel staffing the facility.

It was here that I began to assess the damage to my aircraft. The canard had taken a severe hit to the left leading edge and the lift tabs which attach it to the fuselage were bent; the nose was ground off almost to the pitot tube; the nose gear had been ripped out of its metal pivot; the nose gear shock strut had been bent and the nose wheel fork had detached from the nose gear strut; the landing brake had been knocked askew and would no longer close properly; both right and left lower winglets had been crushed; the starboard wing had compression cracks in the upper and lower surfaces aft of the wing spar and outboard of the attachment points; my brand new wheel pants were ground to nubbins; and the left main gear leg would wiggle when unloaded. At this point, I felt like torching the whole pile of foam and fiber glass and taking a commercial flight home.

I called my hosts, Fritz and Betsy Ganther, told them of the tragedy and made arrangements to meet Fritz at the Whitman terminal after Daedalus II was secured for the night (no fear of him flying away). It was about 95 deg. and I couldn't get warm - perhaps a little bit of shock had set in. The Ganthers were very supportive and empathetic from the outset. There were expressions of concern over the loss of my craft and we all pondered ways to ship the carcass home. At that point, none of us realized how intense things would later become.

The next day (Friday) was the first day of the EAA Convention and I expended a fair amount of energy trying to figure out: 1) how and why the accident occurred and 2) what to do about my plane. Conversations with FAA officials gained me no useful information. I did learn that no paperwork was required since the event was being treated simply as an "incident". The good news was that I would not be burdened with a lot of forms. The bad news, however, was that without any action to change the approach procedures other "incidents" will surely occur.

I attended a Rutan builder's Bull Session and got Bruce Tifft, an experienced Long-EZ pilot, builder and re-builder, to come down and look over the damage. His assessment was that everything was probably repairable, but he reserved judgement on the main wing and the main gear stating that either Burt Rutan or Mike Melville would have to pass on those repairs. My mindset began to swing from junking or shipping to the wild idea of on-site repair and flying home. Mike was to inspect the damage at 5 o'clock, but he could not find the Emergency Repair Facility.

While waiting for Melville to show up, I checked the last frequency that I had punched into my radio and found that instead of 126.6, I had entered 122.6. In the last 30 sec. of my approach I was out of communication with the tower, but having been cleared to land there was no reason to have been concerned that no one was speaking to me. This just points up another inadequacy of one-way tower communication.

Most of Saturday was spent on the flight line and in the exhibitors' buildings checking on the availability of parts and supplies and in trying to button-hole either Burt Rutan or Mike Melville and coerce them into coming down and inspecting Daedalus II. Success came late in the afternoon when Burt agreed to come down himself after presenting a seminar to a packed forum.

Burt's appearance at the Repair Lot attracted a small crowd. I swallowed my embarrassment and took note of everything he had to say. He meticulously went over every bit of damage. He sought out the extent of the compression delamination on the main wing by tapping along the fiber glass surface with a quarter until the sound changed from a sharp "tac-tac" to a perceptible dulling in the resonance. The delamination zone was scribed with a marking pen and pronounced repairable! The main gear had to be repaired, but the extent of the damage and method of repair could not be fully assessed without inverting

the plane. A new outlook was setting in.

Saturday night over dinner with the Ganthers at the Grannery we began to formulate a strategy. The thought of conducting a major repair in a grass patch that swallows nuts and bolts for breakfast was an impending nightmare. Then Fritz remembered that the old Monet hangar at Whitman field was being renovated as an office building and was not only vacant but dormant during the air show. The large bi-fold hangar door had not yet been replaced with a fixed wall. That was the perfect place if it could be made available. Fritz galvanized into action. A few well placed phone calls after dinner and the favor was struck. Not only did I have hangar space, I had an entire vacant building to myself.

Sunday morning the Iowa crew at the repair facility loaded Daedalus II onto a trailer towed by a farm tractor and spent more than an hour slowly and carefully moving my damaged bird down the flight line, across the field and to the Monet hangar. Now the die was cast with a vengeance.

With a shopping list of parts and materials in hand, I went from vendor to vendor in the display buildings like a bee in a field of wildflowers. There was one hang-up. I would need several yards of unidirectional weave fiber-glass cloth. Wick's Aircraft was the only vendor at the air show with such a weave and someone had bought the entire roll the previous day. No more was to be delivered to the air show grounds. The first order of business for Monday was to place a red-label, next-day-delivery order for six yards of unidirectional fiber glass to be delivered to the Ganther's home.

Back at the hangar after the Sunday airshow (which I was unable to watch), I commandeered help from occupants of some of the planes in the adjacent tie-down area. With their help, we disassembled Daedalus into wings, canard, canopy, cowling, prop, spinner and fuselage. I then drained the gasoline and oil from the craft in preparation for inverting the fuselage. Phil Martini, the new owner of the Monet hangar stopped by to see how things were going. He was accompanied by Andrea Ruffner, a Veri-Eze pilot from Switzerland. Andrea volunteered to stop by on Monday afternoon and help - my first offer of real builder support.

Monday started early. What tools were not available from the Ganther's home were obtained from the stockpile at Ganther Construction. Steve Tyson, the Ganther's machinist took me in his charge and we stopped by Oshkosh Auto Supplies and had the shock strut straightened. At the hangar, Steve and I attached a come-a-long to a hangar beam and lifted the fuselage up by the prop extension. With the help of several volunteers from the transient aircraft tie-down area, we rotated the fuselage into an inverted position to make access to the nose gear and main gear more feasible. There Daedalus was to hang like a patient in traction until the job was done.

Andrea showed up after lunch and jumped right in. By 5:30 we had the nose gear attachment removed and a pretty good start on preparing the damaged areas for repair. We were sopping wet from perspiration and caked with dust. The Ganther's showed up to cart Andrea to the University dorms where he was staying and me to their home so both of us could become civilized enough to have them join us at the international hospitality club dinner for composite aircraft builders.

The approximately 200 people present at the dinner were linked by a common bond - interest, fascination and even love for the design and performance of Rutan aircraft. The atmosphere for me was electric. Builders and drivers of Rutan designs were there from all over the US, Canada and Europe. Of course the Rutans (Burt, Dick and Mom), Jeana Yeager and the crew from Rutan Aircraft and the Voyager project were on hand. I requested a few speaking minutes at the end of the program during which I described my

accident and current predicament and made a low key request for help at a Daedalus repair party scheduled for 2 pm the next day. The request was made in the hopes that the special delivery glass and the people would show up in that order. After the dinner, several people indicated that they would be glad to help. Michael Hill volunteered to bring along his complete set of Long-EZ plans and "Canard Pusher" and "Central States" newsletters. That was to become a big help.

The next five days became a blur of activity starting with a wake up alarm at 5:45 am and ending after a much needed shower with collapse in bed around midnight. The details and strict chronology are lost in the blur, but what is not lost is an appreciation for the tremendous amount of help that I received from all quarters.

Tuesday morning, Walter, an EZ driver who had had to repair a broken main gear, stopped by the hangar to survey my damage. In his assessment, the main gear had to be removed and repaired. Even though I hated to hear those words, I was relieved to have the decision made.

The fiber glass arrived at the hangar around noon. I found an unused picnic table at the back of the building and turned it into an epoxy mixing station. A postage scale from the Ganther's served as the epoxy balance. The mixing cups were given a one-half ounce offset on the balance and then tared with coins - a nickel for the large cup and four pennies for the small cup. A smooth topped desk became the glass cutting station. Saw horses standing around were corralled to support the injured starboard wing. The shop was ready to receive workers.

At around 2 pm, people started to show up. I had expected a few and I got a crowd. Not a crowd of spectators and curious on-lookers, but experienced, eager and enthusiastic builders. Tasks were assigned and the work started. I tried to get the names of all the helpers but most were too busy to be bothered with recording their names.

Earl Thompson from Alabama took on the roll of the great procurer, providing munchies, soft drinks and southern hangar talk for all who would partake and listen. It still isn't clear to me where Earl got the piece of styrofoam that we needed so badly to rebuild the nose. It seemed to appear out of nowhere.

Michael Hill kept all the repairs legal with frequent reference to his Long-EZ plans. Andrea Ruffner worked with the perfection of a Swiss watchmaker from the era when the main spring was king.

My skilled workers hailing from Texas, California, Alabama, Illinois, Maryland, Switzerland and Canada worked with precision and care grinding the glass layups in the damaged areas to perfect 1"/ply tapers, cutting glass cloth and mixing and applying epoxy. At near 100 deg. F in the hangar the epoxy flowed like water and cured rapidly.

No one seemed to mind the perspiration that soaked our clothing. By 7:00 pm the major layups of the flying surfaces were complete and hangar talk filled some of the time while waiting for the epoxy to cure sufficiently to fill the weave with a dry mixture of epoxy and glass microballoons.

By mid-morning on Wednesday, I had the nose gear parts epoxied into place on the strut. Andrea and Michael arrived shortly afterwards and we spent most of the afternoon extracting the main gear from the undercarriage . We succeeded in removing the gear in time to deliver the assembly to Oshkosh Auto Parts (NAPA) just before closing at 5:00 pm. NAPA was to straighten the bent bolts and port guide tube first thing Thursday morning.

It was now clear that the main support wrap on the port side of the gear was going to have to be rebuilt. That meant four, 18-ply layups plus the need for a special device called a spot-face tool. Michael Hill turned to his Central States Newsletter address list and found that there was a Long-EZ builder located in near-by Appleton. A phone call to Tom Kranzusch that evening produced the promise of delivery of one spot-face tool to the Monet hangar the next morning.

Thursday morning was spent laying up the main gear attachment taking care not to lose the extremely critical bolt alignment. If the original alignment is not retained the gear cannot be made to fit the undercarriage without a major rebuild of the fuselage. Thursday afternoon I relaxed for the first time and got to wander through the Fly Market and the exhibition booths. I even purchased a new Soft-Com headset in anticipation of additional flying with passengers.

The heat was oppressive and the air was heavy. Something was about to change in the weather! After lunch the vendors in the Fly Market began to batten down their tents in anticipation of a big blow. I caught the shuttle bus back to the Monet hangar and completed the 400 yard dash from the bus stop to the door just as the sky opened up and drenched the parched earth. The rain swept by the hangar in horizontal sheets for about 45 minutes. Pop tents tumbled end over end through the tie-down area and at least one plane turned turtle in the gale. I wondered how Michael Hill had fared with his tent which was pitched in an open field. I felt fortunate again that Daedalus was resting securely in a completely protected place.

At around 4:00 pm the Ganther's showed up to ferry Andrea to Appleton to catch a flight back to Switzerland via Iceland. I was sad to see Andrea go. I knew I would miss his help and companionship. The Ganther's continued to be just super. As usual, they left a car and a cooler filled with supper and liquid refreshment so I could stay at the hangar as long as I needed.

Friday morning Michael and I worked feverishly to get the main gear to realign in its cradle with no success. Dean Yarborough, a free-lance photographer and an acquaintance of Michael's showed up to view the project and ended up as a willing helper. With care and patience the three of us overcame the frustrations of misalignment and with a few well placed whacks with a hammer the recalcitrant bolts passed through the appointed holes. What a sense of relief ! !

Friday afternoon was spent repairing the surgical damage to Daedalus' underbelly resulting from the gearectomy. The critical repairs were complete. It was all downhill now - nothing left but cosmetics. Michael and I celebrated by my treating to a filling meal.

Saturday morning was devoted to touch-up priming and painting. The '88 Oshkosh fly-in was history. The hot sun beat down on empty, dusty fields of dried and trampled grass that only a day before had housed 10,000 planes. The help associated with all those planes had also evaporated like water on the hot asphalt outside the hangar. Michael, God bless him, had chosen to stay the weekend still camping out to see Daedalus once again take to the air.

The time had come to return the fuselage to an upright position - a task that required more people than just the two of us. The only sign of life in the area was a teenage boy mowing a lawn across what was now a major street devoid of traffic. I excused myself and disappeared from the hangar. Five minutes later I returned with the teenager, his younger brother and their father. With their help, Daedalus once again stood on his own feet.

Reassembly of the canopy and canard and filling the crankcase with oil required no more than two people. The main wings, however, require at least three people. Once again we hailed a lone individual passing by with a knapsack on his back. He turned out also to be a residual aviation enthusiast.

Dick Wood, a Veri-Eze builder from California and a friend of our passing hiker, happened by and wing assembly became a simple matter. After attaching the wings, we poured the drained fuel back into the wing tanks (done outside the hangar with a fire extinguisher close at hand).

Using the back of a swivel chair as a marker, Dick Wood adjusted the prop runout to less than 1/16 of an inch and the repair task was completed. The remainder of the evening was devoted to returning the Monet hangar to a condition better than when I began.

On Sunday morning, all inspections passed muster and Daedalus was ready for final fueling, obligatory departure photographs, taxi-testing and launch.

Daedalus, at maximum gross weight, tracked true during the long roll down runway 27 and lifted off with his full load of fuel as if nothing had happened. By the time I reached the western shore of Lake Michigan, I was confident that the aircraft was sound. The military operating area over the lake was inactive and I climbed to 11,500 ft. to get every bit of gliding distance I could while crossing 75 miles of open water.

The entire flight home was pleasant and smooth. While flying over broken nimbo-cumulus clouds east of Rochester I glanced down to my left. There, racing along the fluffy layer of sun-drenched cotton puff, was the shadow of a rear engine, futuristic aircraft. That etched image of Daedalus leaping from cloud top to cloud top was tightly ringed by a brilliant, perfectly circular rainbow - a diffraction phenomenon known as the pilot's halo. I once again felt warm and comfortable and in tune with sport aviation.

Marcus P. Borom
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cover in chronological order.
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