DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

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13th Annual Tandem Wing Field of Dreams Fly-In

By Jeff LeTempt

October 2, 2003
The weather here in MO was PER-FECT today. It was probably one of the nicest days of the year. We had 4 planes arrive today because the weather outlook is less than ideal for tomorrow. Jerry Marstall (Tri-Q2) and Ernest Martin (Tri-Q200) arrived as a flight of 2 from NC at about 1500. Not long after they arrived via tandem wing plane, Nancy Marstall and Donna Martin arrived via Honda. At about 1600 David and Diana Bourque (Dragonfly MK-II) came in from Abbeville, LA.

Terry Bailey showed up in his van at about 1830 and Bob Johnson showed up in a rental car at about 1900 after a very interesting commercial air flight. And then my hero, Charlie Johnson (AKA - One Sky Dog), landed his Dragonfly MK-II at about 1945....10 1/2 hours after he left Ogden, UT this morning. What a stud!!!

All the planes were put to bed in the hangars and things are looking good for tomorrow. They are still calling for a 40% chance of rain tomorrow, but Saturday is looking really nice.

Pilots Who Flew Their TW Plane to the Fly-In

Name	Plane	Tail #	Hometown
Charlie Johnson	Dragonfly MK-II	N157JG	Ogden, UT
David Bourque	Dragonfly MK-II	N100HK	Abbeville, LA
Ray Parker	Dragonfly MK-II	N47DX	Loveland, OH
Richard Werner	Dragonfly MK-I	N4862H	Chesterfield, MO
Wayne Ulvestad	Dragonfly MK-I	N69DF	Volga, SD
Mark Beres	Dragonfly MK-IIH	N636AA	Gulf Shores, AL
Steve Laribee	Dragonfly MK-II	N88SL	Charleston, IL
Mark Carroll	Dragonfly MK-II	N43TD	Murray, KY
Terry Crouch	Quickie	N14TC	Bettendorf, IA
Jerry Marstall	Tri-Q2	N222RR	Ashville, NC
Dave Dugas	Q2	N68DD	Athol, MA
Jerry Kennedy	Q2	N214FK	Souix Falls, SD
Ernest Martin	Tri-Q200	N479E	Arden, NC
Lynn French	Tri-Q200	N142LF	Broken Bow, NE
Jim Doyle	Tri-Q200	N56DW	Springfield, IL
Sam Hoskins	Q200	N202SH	Murphysboro, IL
Paul Fisher	Q200	N17PF	Taylor Ridge, IL
Jim Patillo	Q200	N46JP	Fremont, CA

October 3, 2003
I arrived at the airport at about 0730 and the weather was not looking great. I got some help from the growing crowd with setting up for the composite construction class. I got some expert help with the composite construction class from Charlie Johnson and Bob Johnson. Charlie works with composite materials every day as a profession and Bob has spent…… well let's just say a long time building his Dragonfly MK-II.

At about 1200 I got a call from a newspaper reporter from Peoria, IL. He passed along some very bad news that Rich Goldman had been involved in an accident with his MK-IIH Dragonfly. He did not have any details about what happened, but he could tell me that Rich was not hurt. I was relieved to hear that Rich was ok. Rich called me Saturday morning and

(Continued on page 3)

Ernest Martin's Beautiful Tri-Q200. Ernest received awards for Best Q Interior, Best Overall Q, and People's Choice. What a beautiful tandem wing airplane!!!!!!

(Continued from page 2)
filled me in on what happened. See page 7 in this newsletter for a detailed account of Rich's accident.

We had 21 people in the hands-on composite construction class. We talked about everything from shop safety, to foam, to reinforcing materials, to hot wire cutting foam, and we even did several practice lay-ups on urethane and styrene foam. The class was scheduled for 4 hours, but we spent 5 hours on the class and could have spent another 5 hours. I really think everyone who participated in the hands-on class learned a lot and hopefully we will have a few new tandem wing builders among us!!

Throughout the afternoon we had several airplanes show up. As near as I can figure we had a total of 15 planes on the ground at Sullivan Regional Airport, 3 spam cans and 12 tandem wing planes!!! Despite the less than ideal weather, we had a terrific turnout. We bedded down all the tandem wing planes in hangars and headed out for dinner at the truck stop. I do not have a good count on how many people were there, but I would guess about 55. The food was good and the stories were all interesting.

After dinner a few of us headed back out to the airport for a little airplane repair work. Earlier in the day, Jim Patillo's prop sustained a little damage and needed a minor repair. Fortunately I had a bunch of supplies in the hangar from the composite construction class. We just mixed up some epoxy and flox to repair the damage to the leading edge of one prop blade. Jim was really looking forward to the performance run scheduled for Saturday morning, but that was now in question. We left the airport at about 2215.

October 4, 2003

I arrived at the airport at about 0730 and there were already people hungry for some tandem action waiting for me. One comment from last years event was to have the performance run first thing in the morning while the air was still nice and calm. So I conducted the performance run briefing at 0830 and the first of 8 aircraft departed at 0914. We had a 101 SM three leg course. Jon Finley, Dave Richardson, and I handled the event timing and everyone was treated with some very high speed low passes down the runway.

Dave Richardson led the Q forum and just about every chair was filled. Next up was Spud Spornitz who led the Dragonfly forum. It was standing room only for the AeroElectric forum given by long time tandem wing supporter, Bob Nuckolls. Bob had everyone's undivided attention for a full 2 hours, well except mine I guess. I was out supervising the aircraft judging and happened to walk by Jim Patillo as he was replacing his engine cowling.

Jim asked me if I wanted to go out for a flight with him. After about 1/10 of a second I said well if I have to. Jim has an incredible airplane, both in looks and performance. I was treated to about a 30 minute flight that was HUGE FUN. We saw speeds as fast as 189 knots and as slow as about 70

(Continued on page 4)

Performance Run Results

Name	Plane	Speed (MPH)
Sam Hoskins	Q200	198.546
Jim Patillo	Q200	191.541
Ernest Martin	Tri-Q200	180.068
Paul Fisher	Q200	173.043
Lynn French	Tri-Q200	158.560
Jerry Marstall	Tri-Q2	142.810
Charlie Johnson	Dragonfly MK-II	137.519
Terry Crouch	Quickie	101.602

Richard Werner's MK-I—Best Dragonfly Interior

Charlie Johnson's MK-II Dragonfly—Longest Distance Flown in a Dragonfly to get to the Fly-In. Charlie is getting ready to head back to Utah while his brother Bob says goodbye.

(Continued from page 3)

knots. We did some formation flying with Jerry Kennedy in his beautiful yellow Q2 and then Jim demonstrated how well a Q200 will roll. It was an amazing ½ hour that I will never forget – thanks Jim!!!!

By this time we had a total of 18 tandem wing planes on ramp, 19 if you include the VariEze. We also had, as near as I can figure, 11 other airplanes that flew into the event. Thirty planes!!! Wow!!! Sullivan Regional Airport is also home to a sky diving school and a medical evacuation helicopter so there was all kinds of aviation stuff happening throughout the weekend.

The awards banquet on Saturday evening was held at the Sullivan Community Center. The event was catered by MO Hick BBQ from Cuba, MO. The first thing we did was eat!!! Then we went around the room for introductions. It was very similar to last years introductions until we got to Sam Hoskins. Sam was the next to last person for introductions. He had his girl friend Sandy Smith stand up to give her a special thanks for supporting him with all his airplane interests. Then he pulled something out of his pocket, got down on one knee, and proceeded to ask Sandy to marry him. It was a very emotional moment and I was honored to be a part of this special moment for them. I really felt kind of sorry for Lynn French who was the last person to introduce himself. Lynn said how can I follow that?

Then Nancy Marstall read a letter that Sandra Starns had written to the group. Her husband Bud was killed earlier this year on the maiden flight of his Q. She told me that she wanted to come to the event for a little closure. After the performance run, Sam Hoskins took Sandra for a flight in his Q-200. She also asked Sam to scatter Bud's ashes, which he did at the end of the runway right before their flight.

I then recognized a few volunteers for their help with the fly-in; Bob Johnson and Charlie Johnson for their help with the composite class, Spud Spornitz for handling the Dragonfly and engine forums, and Dave Richardson for doing the Q forum, helping with the performance run, and organizing the group photo.

I presented each of them a 3/4" thick cast acrylic award with a CNC machined tandem wing plane that recognized them for volunteering their time and expertise. Thanks for making the event great!!! Next up on the agenda was the presentation of awards. I created a few new awards this year, specifically an award for the longest distance traveled to get to the event and a People's Choice Award.

(Continued on page 5)

Award Winners

Award	Name
Longest Distance Traveled	Paul Buckley-Cheshire, England
Longest Distance Traveled in a Dragonfly	Charlie Johnson—Ogden, UT
High Time Dragonfly	Wayne Ulvestad
Best Dragonfly Interior	Richard Werner
Best Overall Dragonfly	Wayne Ulvestad
Longest Distance Traveled in a Q	Jim Patillo– Fremont, CA
High Time Q	Sam Hoskins
Best Q Interior	Ernest Martin
Best Overall Q	Ernest Martin
People's Choice Award	Ernest Martin

(Continued from page 4)

We gave away a few door prizes, but by that point, my brain was like mush, so I do not even remember who won what. We stayed around the event center until they kicked us out at 9 pm and then we stood around in the parking lot for another 1/2 hour talking about planes....imagine that.

October 5, 2003

Most of the airplanes departed for home, but a few stayed around to give more rides and pilot orientation flights. My 15 year old son Justin was not able to attend the event on Friday or Saturday, but I did drag him out of bed at 0600 on Sunday to come with me to the airport. I asked Jerry Marstall if he would take Justin up for his first tandem wing flight. Justin had a great time - thank you Jerry!!!!

I did an X-Plane forum for about 8-10 people on Sunday and by about 1100 everyone was pretty much gone. Dave Morris stayed showing his glass cockpit off until about 1200 and then Justin, Terry Bailey and I cleaned up the hangar - thanks for your help Terry.

I have so many memorable moments from the event. The most memorable was Sam asking Sandy to marry him, next was my flight with Jim, and certainly the interest for the composite construction class. I was also very impressed with how beautiful Q's there were. How the aircraft judges could pick a favorite Q aircraft was amazing. There were some many beautiful award winning Q's to choose from. I have made some wonderful new friends and of course it was great to visit with old friends. This event is all about getting together and sharing our love of tandem wing planes.

Wayne Ulvestad's MK-II Dragonfly—High Time Dragonfly and Best Overall Dragonfly

I have posted several hundred pictures on the event web site at:

www.fidnet.com/~letempt/

I really want to thank everyone for supporting the event and all the very kind words about the job that Jill and I did in organizing the event. I really think Sullivan was a perfect place for this event and the support that was given by the City and more specifically, the Airport Manager, was exceptional. I will be presenting one of the awards to the Airport Manager at the next Sullivan City Council meeting.

More details will follow, but expect Spud to host the 14th Annual Tandem Wing Field of Dreams Fly-In back in KS on 24, 25, and 26 September 2004. Look for an article in the very near future about the event.

Jeff LeTempt
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Fuel Tank Bonding/Grounding

By David Gall

For background, read the following two pages:

http://www.faa.gov/avr/afs/news/archive/march/Static1.htm

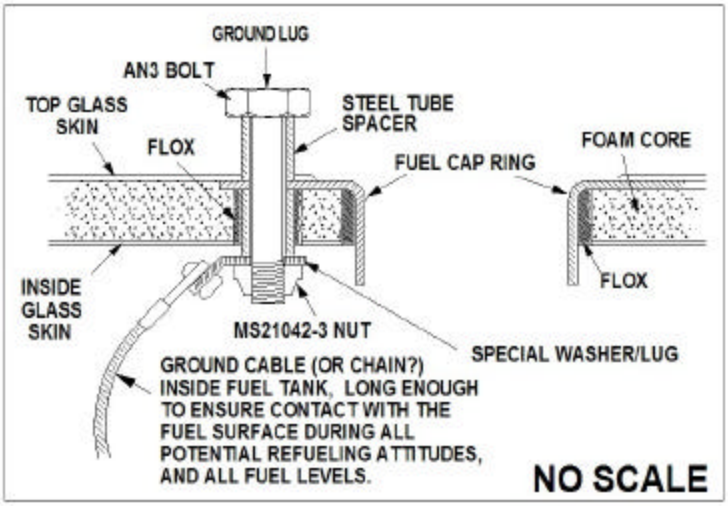
http://www.faa.gov/avr/afs/news/archive/march/Static2.htm

This is good information, but does not address the issue from the designer/builder viewpoint. We are responsible for constructing our plastic planes in such a manner that the foregoing advice is applicable. To that end:

Static electricity builds up on the surface of fuel. Not throughout the bulk of the fuel, but on the SURFACE. The charge is a result of friction, either due to sloshing within a non-conductive tank or due to traveling friction as when flowing through a pipe. When transferring fuel from one container to another (or from the pump or fuel truck), the fuel generates a tremendous electrical charge on the way out of the nozzle. The nozzle acts as a charge separator, dispensing fuel of one polarity while building a charge of opposite polarity on itself. Just like socks on carpet. If there is no conductive path for the resulting charge to make its way back to the nozzle by conduction through wires, it may make its own conductive path through the air: spark, just like fingers on a doorknob.

The plastic gas cans we buy at Wal-Mart are made of a conductive plastic. The fuel nozzles at the automobile gas station are grounded by wires encased in the hose itself. Placing the gas can on the ground completes the circuit and the can and nozzle are grounded and bonded to each other. Same for metal cans. Alternatively, placing the nozzle in direct contact with the can (metal or plastic) will complete the bonding circuit. However, there is a small risk of spark at the point of contact (just BEFORE actual contact is made). It is this contact that routinely bonds our vehicles via the metal-to-metal contact of the filler nozzle to the filler neck (don't you feel safe?).

The small incidence of refueling fires occurs mostly in older-style fillers where it is possible for the operator to unwittingly prevent the nozzle from contacting the filler neck. During the fueling operation, the static potential between the nozzle and neck increases (friction, remember) until the voltage is enough to jump the gap in the form of a spark. Likewise, the fool who fails to remove the plastic gas can from the back of his truck - truck bed liner or not! - can create the same conditions by failing to make contact between the nozzle and gas can. Or, if there is a bed liner, the static charge on the gas can BEFORE the nozzle makes contact may make a spark sufficient to ignite the fuel-air vapors: boom!



The charge built up from refueling is not the only way to build up a static charge. The almost-non-conductive plastic that our airplanes are made from makes an excellent charge collector just by moving through the air - flying. When we land, that charge stays on the airplane unless a path is provided to dissipate it. That charge will collect and concentrate in the metal parts of the plane. Similarly, on-board electrical equipment that is not properly bonded to a COMMON "ground" can set up charges on the airframe. If your airplane grounding/bonding point is in a flammable mixture (open fuel tank) at the instant you ground it, the inevitable spark may start a fire.

Make no mistake, there IS a spark when completing the grounding/bonding circuit, however small: the low incidence of fires is because there is not a flammable mixture at the spark location. That may be because the spark location is remote from the fuel, or because the fuel-air ratio is not suitable for ignition, or just that the spark is too small (not enough heat). The typical auto fuel filler neck has too much fuel vapor (too rich mixture) to ignite from the usually-microscopic grounding spark.

Humidity is a very poor choice of grounding/bonding conductor. Relying on the relative humidity of the air to dissipate a static charge may work for the small potentials built up by socks on carpet, but it is entirely insufficient for the charges built up by the refueling operation, or even just normal flying or driving. I live in central Florida and I can get a shock almost every time that I get out of my vehicles if I choose (it depends on whether I hold onto the door as I get out); the humidity here is not sufficient to rapidly dissipate the charge that builds up on my car or truck just from normal driving.

(Continued on page 7)

(Continued from page 6)

As I said before, static electricity builds up on the surface of fuel. Inside the fuel tank, this charge is distributed over the surface of the fuel. But dissimilar charges attract, and if an oppositely-charged item is brought close to the surface of the fuel, the charge on the fuel will rush toward it.

If the resulting charge concentration is sufficient, a spark may occur. To prevent this, it is necessary to remove the charge from the SURFACE of the fuel. Commercial products do this by being made of conductive materials. Conductivity (among other things) is what differentiates an "approved" plastic gas can from a milk jug. The almost-non-conductive plastic that our airplanes are made from does not meet this criterion.

To dissipate the charge on the fuel effectively in our plastic airplanes, it is necessary to have a conductor that contacts or penetrates the surface of the fuel regardless of fuel level. This conductor should also be connected to the fuel filler neck, fuel filler cap, fuel drain, fuel line, and any other metal or conductive item that comes in contact with the fuel, in order to prevent these items from acquiring differing levels of electric charge.

The conductive circuit need not be entirely within the tank, but may consist of electrical connections to a common ground or bonding point. However, the conductor that penetrates the surface of the fuel absolutely MUST be in constant contact with the surface of the fuel at all normal operation attitudes and especially at ground parking attitudes regardless of fuel level (especially at near-empty when the explosion hazard is highest). This may require more than one wire. The ONLY solution that satisfies all the foregoing requirements is one that is permanently installed in the fuel tanks and has a grounding/bonding-cable attachment point well away from any potential source of fuel vapor. Ideally, this grounding/bonding point is accessible before the fuel tanks are opened, in order to minimize the release of vapors prior to grounding, and the grounding/bonding cable connection is completed prior to opening the fuel filler cap. The Central States Association newsletter and others have published several ideas detailing both new construction and retrofits for existing composite airplanes.

Remember, there WILL be a spark.

David J. Gall

Dragonfly Down

By Dr. Richard Goldman
Dragonfly N222TH

OSH 2003

I write this with a heavy heart, as I procrastinate with respect to filling out the FAA forms. These acts will probably close out my wonderful 22 year odyssey with dragonfly N222TH.

I am glad, considering the circumstances, that I am able to write this. I'm apparently free from any physical effects, save a small safety belt harness burn on the left side of my neck and minor lower back pain, brought about by my Dragonflys, unscheduled contact with terra firma. The Dragonfly, unfortunately, did not enjoy the same fate as I. In effect; it was almost as if it sacrificed itself for my well being. Fiberglass and the strength built into the d-fly is a great thing. Now to the meat (or carnage) of the story.

About 1 year to the day after my first long cross country flight to the Burlington field of dreams, I was merrily flying to the Sullivan fly-in. I was at 4500' with a 6000'ceiling, flying through moderate rain and 30-35 kt headwinds with visibility down to 3-4 miles at times. The plane handled perfectly (despite the incredibly slow ground speed), and the Midwest/ Diamond/ Norton was snorton its familiar humm. I was especially pleased because on this flight, I had mused about how I had finally gotten out all of the minor bugs with which all builders must deal with and solve, usually for extended periods, after the "finalization" of their projects. All systems were operating beautifully;

(Continued on page 8)

(Continued from page 7)

including the ventilation and defroster system, as well as the cabin heater.

Taking off from Kenosha (ENW) just before Bush's campaign TFR over that area, my plan was to land at Peoria (PIA) to empty myself and fill the plane. About 25-30 minutes before PIA, the rain had stopped; there was an overcast of approx 6000' with visibility approx 10 miles. Unable to clearly hear the PIA ATIS, I descended to 1900' in order not to bust the top layer of PIA class C airspace. After getting closer, I was able to hear the ATIS. I contacted the tower and was immediately handed off to approach control, and assigned a runway (straight in approach) and a transponder code. At this time I was gliding with minimum power, to reach 1900'. After changing the transponder, I advanced the throttle to arrest the descent, and although the propeller was spinning, I did not get the usual increase in sound and the feel of power, but most importantly, I was not able to arrest the descent while maintaining cruising airspeed.

Following engine out relight procedures (all engine parameters were normal), which were unsuccessful, I asked approach if there was a closer airport than PIA, which was now 7 miles away. Approach responded with vectors to Mt Hawley, approximately 1 1/2 miles north east of my position. After turning in that direction, I realized that with my remaining altitude, even that was impossible. My options (with 30 knot gusting winds from the south) there were slim: one field into the wind that appeared freshly plowed and incredibly rough or one downwind that looked smooth. I elected to attempt a downwind, high tailwind, no power landing with the hope to "save my bacon".

Upon making the downwind turn to final (boy I hate that term), at probably 50' AGL, (although who's looking at altimeters at this point), I felt the canard stall with it's characteristic nose down bob. The ground, now including a railroad tack, (with its obligatory pole and tree line) filled the windscreen. Knowing that if I pulled back on the stick I was finished, I pushed it further forward.

Shortly (seconds or a second) before the ground came up to smite me, I felt the canard resume flying (perhaps the gust that had my name on it stopped, or the increased airspeed created by the forward stick really helped), and I pulled back on the stick. This had the effect of raising the nose as I pancaked into the ground in what seemed to be a relatively horizontal position. The plane skidded on the grass (luckily, I had chosen a sod farm, probably the only relatively smooth piece of land within 10 miles) and came to a stop in about 300' (who says that the d-fly needs a long runway.)

Two women (employees of the sod farm) witnessed the "descent" and called 911. I noticed to my surprise, that after the plane came to a rest, the engine was still smoothly ticking over at what seemed to be the identical speed which I observed in the air. The first thought that came to my mind was, "perhaps there isn't as much damage to the plane as I had thought." There was, however, steam coming from the cowl. I advanced the throttle to see if the engine had corrected itself or if this whole affair was a figment of my imagination (always the optimist), however it did not respond. Thus, I shut it off. When it stopped, I noticed that each warp drive blade (3) was fractured off about 6" from the hub.

I got out of the plane and counted my fingers and toes and other assorted appendages, verifying that they were all present. The two women approached in a small truck after witnessing the "arrival". Shortly they were joined by a couple of Peoria sheriff cars, a couple of IL State troopers, three or four reporters from radio, TV, and newspapers (one of hem called Jeff at Sullivan to share the news), and the EMT's complete with ambulances (Mars lights flashing, however, no sirens—darn). My ELT had gone off and there was and an Air National Guard search and rescue plane circling overhead.

The FAA came in from Springfield. Each agency has its own forms and bureaucracy. Glad to be alive and kicking, I happily answered the same questions in various ways to at least

(Continued on page 9)

(Continued from page 8)

four people and authorities. The FAA notified the NTSB and shortly thereafter they released the plane back to me. Apparently since there were no injuries, the only property damage was to my poor Dragonfly, and there were no obvious mechanical failures; no further on-site investigation was deemed necessary.

Now for the damage: Dragonfly N222TH did not fair so well. Although looking at it on the ground, it was relatively intact, closer examination revealed the following, which in my judgment totaled the aircraft.

The right main gear had broken off close to the fuselage and was now jammed between the elevator and the ground. It looked like a Cessna 210 (or 182/172RG) with the gear trying to complete a retraction. Although broken, it was still attached (more on this later). The canard tips were broken off and the wheel pants were now wheel shorts. The lower cowl was substantially missing, as was the radiator and the exhaust system. The induction system had been torn off and rotated backwards And this was the good news!

Looking at the outside of the fuselage in the area where the canard drag bulkhead attaches, I noticed (on both sides) that the glass was broken. This exhibited itself as two vertical lines of unpainted area approximately 1/2" wide, exposing torn fabric, extending up about12". (See photo below) The surface was rough glass, obviously fractured from the "arrival". This

fracture appeared on the outside as well as the inside of the fuselage. This area is one of the strongest areas of the fuselage and it had gone through a failure mode similar to attempting to open as if it were the front of a C5A, or that pregnant Airbus that appeared a OSH this year. On the top of the front turtle deck, there was a rip extending from the front right corner of the access panel forward to the right approaching the firewall.

I inspected the areas around the rear turtle deck where the area over the wing approximates the deck which is fixed to the fuselage. There was evidence that there was movement there. Shaking the wing confirmed this. The movement was so great that the only immediate explanations for this were separation of the lift fittings (unlikely) or that the force of the arrival stripped the bulkhead (holding the wing) from the fuselage.

Damage to the sod farm was restricted to a small divot about the size of a welcome mat (and who says I don't play golf) where the right wheel originally struck. From the minimal ground track, it appeared as if the plane became slightly airborne after first contact, settled nose down, hit ting the prop tips and as they were being sacrificed, leveled off and skidded to a stop. The steam, was due to the fact that the radiator had been ripped off of its mounting and lay at the beginning of the debris track from first contact to the final resting place. The plane was trucked to a temporary storage place, an automotive towing yard (of all the indignities).

Being only approximately half way to Sullivan, I rented a car and elected to drive home after all of the formalities were concluded. While driving, I was listening to the radio and happened to catch a newscast which reported "A small aircraft has made an emergency landing at a sod farm, the pilot was apparently ok, but we are still investigating." Kind of like observing one's own funeral, however some people will do anything for their 15 minutes (30 seconds) of fame.

The 'arrival' happened on Friday morning. The next Wednesday night, I flew back to PIA in a Skyhawk. I rented a 26' U-haul truck, and Thursday morning disassembled the aircraft remains for shipment. The job which I thought would take about 3 hours, took 10. I took the engine off as well as the wings so that I could get it into the truck. The weather was warm, but it rained practically the entire time and I did not have any raingear. Adding insult to injury, the discomfort of all those hours of working in the rain, soaked to the bone, was soothed by the 4 hour drive back home in this mammoth noisy, malodorous, but incredibly sleek (yeah, right) and fashionable U-haul. My once precious, intact, wonderfully flying Dragonfly was now tied down in pieces like cargo (to prevent shifting) on its way to an autopsy.

Friday morning I unloaded the plane parts into my hanger and returned the U-haul hearse. I then proceeded to drive to Lexington KY, where I had organized a board meeting fly-in (or in my case, a drive-in).

A more detailed inspection back at home revealed that the wing bulkheads were intact,. However; the landing forces (or should I say the stopping of the landing force) had caused the holes in the aluminum inserts in the wing lift and drag bulkheads to become elongated. This allowed the post accident wing movement.

The cause of the engine problem is still unknown, however in consultation with the developer of the electronics, it seems as if the ECUs (supposedly duplicated) did not get the message from the MP sensors that there was an increased load, and merrily went along, supplying fuel as if the engine were idling. Further investigation is pending.

(Continued on page 10)

(Continued from page 9)

By the way, in flight, especially in turbulence, the wing and canard do have some natural movement, because, unlike the Q birds, the attachment to the fuselage is inboard of the fuselage sides. In fairing these surfaces, make sure you allow for this movement. (perhaps with silicone).

I do have some comments about the Dragonfly which may be helpful to some of you. Understand that these are my *opinions* only and are not meant to be suggestions for the builders/flyers. With that caveat, what follows are my observations (and not suggestions to builders/flyers).

Glass verses metal gear; Bolted on verses glassed in; MK-I verses MK-II verses MK-IIH:

I am very thankful to Gene DeVincenzo who came up with the first glass hoop gear, many years ago. In my arrival, the gear (because of its elastic properties) absorbed much of the vertical and horizontal loads in a characteristically glass-like (spelled relatively slow absorption and dissipation of energy) manner. It finally failed, but still remaining attached to the plane by the hydraulic brake line and its conduit. A standard MK-II gear would probably have snapped off much sooner, and the remaining part (much farther removed from the midline of the plane) could have dug into the ground, potentially leading to a ground loop and maybe a roll-over.

The left gear leg remained intact, but the tire was separated from the wheel. Chalk one up for the hoop gear. A MK-I would definitely have had more severe problems, in that it is possible that the right wheel could have contacted the ground before the plane was righted, causing the same effect of the broken standard MK-II, except its a much longer moment arm with severe directional difficulties.

Fiberglass makes a very gentle gear, both in normal and more than normal landings, as in this accident. My first airplane, an American Aviation AA1 (Yankee), had glass gear. It absorbs and transfers stresses differently, due to its more elastic properties. (As people who have flown Yankees, Tigers and Cheetahs) I feel that the gentle characteristics and structural failure of the glass gear is what saved my day.

My experiences with metal gear, as well as metal cars in accidents, the flexion characteristics are much more linear with metal than glass. The absorption, transference and fracture mode is quite different, and probably more violent than glass. Witness a botched landing of a Cessna verses one of a Yankee. In my situation, a metal gear may have flipped me, ripped through the fuselage, or done the same thing?

Perhaps graphite would be a great material for the gear, although I will leave it to those more schooled in composites than I. Not because of the characteristics, but because of the weight.

Glass in or bolt in? I guess that the question that an accident in a MKIIH with glassed in gear is pretty answered now. There was NO rupture of the fuel tank, even though the forces were great enough to break the leg (sounds like a theatrical thing).

Other scenarios come to mind. What if the gear was bolted on? If the bolts were to snap due to the tremendous torque at impact, with the forward movement of the airplane (now a sled), there is a high probability that the next airframe contact of the severed bolts would be the belly of the airplane, right in the fuel tank. This could cause the tank to rupture and a subsequent gasoline spillage would be present.

The fact that only one leg failed, prevented the bottom of the fuselage from contacting the ground. If bolts failed, it seems logical that the entire assembly would rotate backward and the middle of the gear would intercede between the ground and fuselage in a vertical orientation, just below the fuel tank. Of course the fuel tank is separated from the outside by a minuscule amount of glass, 1/2" of 4# foam and another minuscule layer of glass.

Perhaps we should consider a lay-up of Kevlar on the belly to protect the fuel tank bottom. If fuel does not get out of its normal confines, there will be no fire. If it does, the concept of "an old flame" may have a totally different meaning. It is my opinion that one major weak point of the Dragonfly is the lack of fuel tank protection on the belly—especially with the MK-I. In a canard failure mode, the belly will contact the ground, (been there….done that). A stone on the runway WILL puncture the tank (been there done that) the exhaust stacks (if the landing is done on a hard surface runway) will scrape the runway, yielding a shower of sparks, especially if they are mild steel. (been there, done that) The shower of sparks have the ability to ignite the now vaporized fuel trail from the tank (NOT been there, NOT done that!). For those of you in the building process, consider the Kevlar

(Continued on page 11)

(Continued from page 10)
idea. For the rest of you, consider the Kevlar idea. For those who don't take this warning, consider Kevlar briefs (but only if you are going to land on your belly). Having experienced what we all hope never to experience, sometimes gives one a different perspective.

Now to the engine failure situation. All I know for sure is that I had 10 gallons of fuel on board; my fuel pressure was correct; the throttle linkage was totally intact and operating; electrical power was adequate; and oil was adequate. The engine did not stop nor run roughly. It just wouldn't respond to increased throttle. The fuel filter had been cleaned shortly before (a large surface area, perforated stainless steel cylindrical fuel injection filter) and there was no water or other contaminants in the fuel system. Subsequent examination of the fuel filter revealed a totally clean element.

Both trochoids (cylinders) were equally effected, which rules out an injector being plugged. Things tend to point to a dual computer failure (or one of the sensors that isn't duplicated). I'm beginning to think that the old Bendix mechanical injection system, or heaven forbid, a carburetor and magneto isn't such a bad of an idea after all. Were I to do it again I would use nothing other than a glassed in glass hoop gear (the way I did it). If repair were necessary, or possible, this does make for a mammoth job.

I would definitely recommend VGs on the canard (with the GU canard) and gap seals on both elevator and ailerons. My plane showed no negative effects in rain or when bugged with these modifications. I did notice a 5 knot across the board decrease in stall speed with the gap seals. It was interesting to see rain collecting in the canard/elevator junction. The water just kind of sits there without being blown out from the high pressure below the wing. From what I could see, (visualizing the water) the air seemed to be attached to the wing quite nicely behind the VG's. It is possible that the addition of the gap seals enabled my survival. I did not mention before that the initial impact was less than about 100' away from the train/tree/pole line that I had crossed as my canard stalled.

Again the small (big) print: The preceding comments are my reflections only. They are not meant to scare, suggest a different way of approaching a subject, or criticize anyone for having different thoughts and experiences. I am happy with what I did on N222TH, and some of these things may just have saved my life.

I will end this now, thank you all for listening to this, and in a way acting as my surrogate therapists. You all and my Dragonfly have been a large part of my life, and I will miss that. I really appreciate all the concern that you all have shown. I think that the Dragonfly and tandem wing group is a very special part of my life and am proud of have been a part of it. Thank you all and for all of your kind wishes of condolence. They were most meaningful to me.

I'm still a Dragonflyer.
Rich Goldman
ARGOLDMAN@aol.com

I was very fortunate to have had the opportunity to fly with Rich at the Mattoon Tandem Wing Fly-In this year. I was Rich's very first passenger and I was very impressed with his skills as a builder and Dragonfly pilot. This is a photo that I took of Rich during our flight over Mattoon.

Jeff LeTempt

Builder Profile—Joe Anthony

By Jeff LeTempt

Meet Joe Anthony from Foristel, Missouri. Joe works in the commercial construction industry as an electrician and has been married to his terrific wife Terri since 1971. He began construction of his Dragonfly in July of 1983. Joe has quite a work shop in his basement which includes a lathe, a milling machine, and a TIG welder.

Joe has built his own 1836 VW engine to power his Dragonfly. The

engine has one magneto and one electronic ignition that he built from Chrysler and Chevy automotive ignition parts. But even though Joe has a very nice running installed engine…..for a variety of reasons, Joe decided to change his engine. Joe will be installing a Continental ground power unit (GPU) engine which is very similar to a C-90 or O-200. With very few modifications, Joe will get a rock solid 100 HP.

(Continued on page 12)

(Continued from page 11)

Originally built to be a MK-I, Joe decided several years ago to convert to a hoop landing gear as per instructions contained in DBFN #43. For stopping power, Joe has a set of HAPI lateral displacement hydraulic brakes. Joe has also incorporated an elevator trim system similar to the one that Troy Burris wrote about in DBFN #40.

Look back to DBFN #33 and you will find an article on Joe's gull wing canopy. Joe has incorporated a removable section on his wing cover and also a forward access panel in his forward fuselage cover which makes maintenance much easier. Joe's plane has an empty weight of 730 pounds (with the VW installed) and has been registered as N622A.

After Joe bought a set of incidence jigs from Drew, he found out that he had missed the incidence angle for both the wing and the canard. His canard was set too low and his wing was set to high. In simulation, the plane required almost full down elevator during take-off and generally did not fly as it should. Joe decided to bite the bullet and adjust the wing install angle as much as he could. He is in the process of installing a reflexor system like Patrick Hildebrand's as featured in DBFN #100.

Joe is really quite a machinist and composite airplane builder. The wing and canard on Joe's plane are really quite nice and I am sure it will be a sweet flying plane.

Classifieds

For Sale: **Dragonfly MK I** N812RG, With HAPI 1835 engine, dual ignition, 40 hours TT, A&E, Tera TXN923 Nav/Com w/remote Tri-Nav indicator, new prop, always hangared, excellent condition, needs some engine and cowl work and touched up from sitting for too many years. Includes lots of extras, including all DF newsletters ever published. This has been a labor of love that I need to sell for several reasons. Located in central OH. Serious inquiries only. Asking **$11,000**. Call or e-mail to discuss or for photos. Ronald L. Geese. (740) 964-9497 or email: rgeese1@columbus.rr.com

For Sale: **Dragonfly MK II** N189SM, with 80hp Continental A-80. 250-hrs SMHO by Skeezix Adkisson, and dual Savier electronic ignition. 3 blade Warp Drive prop w/ Gary Hunter blades. Curses 145-150 mph on 4.9 gph. 21+ gallon fuel capacity, dual throttles, hydraulic brakes, ELT, cabin heat, oil cooler and filter. Garmin 195, vortex generators, electric pitch trim. Asking **$23,000** or possibility trade for 2 place side-by-side, tri-gear with turbo or bigger engine. See photos in a recent KITPLANES ® magazine, featuring details on electronic ignition. Call 618-594-2681 and ask for Terry, or e-mail: troneill@charter.net

For Sale: **Carbon Fiber NACA Inlets and Spinners.** Spinners are **$250 each**, including back plate, but w/o front bulkhead. Inlets are $30 per pair, set in glass. Contact Charlie Johnson, 2228 East 7875 South, Ogden UT 84405 (801)-479-7446 or e-mail: OneSkyDog@aol.com

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