Comments from the Diamant Forum

Subject : RE: Diamant 18 ?
Posted : 2006-01-31 7:33 PM
Post #8688 - In reply to #3058

Good Evening to you 55 Pilot:
Althought I've not flown an "18", I have been flying and enjoying a 16.5 with the 18 meter tips grafted on, which brings me to a 17.3 meter ship.
There is a "DIAMANT Users' group" on Yahoo...It is pretty dormant, however there is some really great information there, including landing techniques and assembly of the ship...by one person, and some neat photos, perhaps you would like to start there???
I obtained my DIAMANT back in Late August of 1993, after a year long quest to find one in decent shape. However, I did not fly it until April of 1994. When I traced its' history back in time (it is S/N 012), I found it to be the ship which George Moffatt flew in the 68 Nationls' to 4th place, and the one that is in the photographs in the original issue of "JOY OF SOARING"!
I've been able to obtain quite a collection of DIAMANT related "stuff" across the years, that I really enjoy sharing... Also put together a history of the Type after interviewing 2 of the 3 designers during the 1994 30th Anniversary Celebration of the DIAMANT. Almost all "DIAMANT Drivers" I met have been extremely helpful, and go way out of their way to assist any new "DD"!
I guess if I'd write out everything, this would turn into a very lengthy reply! So let's hit on the basics...Currently there are 6 AD's on the airframe, 5 if you own one of the 10 original HBV's. The 2 most critical AD's relate to the wing spar, and the spar to cap bonding. If this is accomplished then Great! If not then expect to put out another $3~4k to have it completed...If you are able to find someone to do it, and if you can find the factory drawings for the replacement pins and cuffs! (I have the Drawings!) By having these 2 AD completed, the ship returns to its' original VNE which is 154mph, without it you are restricted to the maneuvering speed, which is 104 mph. Other AD's go down to the seat belt attachment points...and the rudder damper...
Moving away from the AD's the next thing to think about is how much do you like your crew, and the folks you fly with??? Why? Simple each wing panel is approx 190lbs! There is 47lbs of lead tucked into the leading edge of each flap, due to early discovered flutter problems! Later manufactured ship, have dual flap drives, and eliminated the extra lead, so their wings maybe a little lighter? Attempting to put on the wings can go very easy...if you have everything aligned properly, or it can be extremely frustrating, if the fuse tilts just the slightest bit! Trying to do this on a hot, humid summer day is where you find out just who your friends really are, and who are the "court jestures" on the field!

The flaps are indeed crusing flaps, they go Neg. and Positive, and are used to trim the fuse to the realative airflow, it is true there are indeed many settings, however after a while you find out what works and what is useless! (Actually there are maybe 5 good settings to remember) The spoilers are indeed speed limiting, and with them deployed it is impossible to exceed VNE.
I am 6'-1" and go about 236lbs, it is extremely tight on me! I am told the Moffatt was 6'-3" when he flew the ship. The flight position is like something I never experienced, however it is quite comfortable. There is no spare room anywhere in the cockpit. I have had the panel rebuilt from its' original shape to give my legs more room to wrap around it, however I flew with the original panel for several years, with no problems. I have a replacement canopy on my ship, the original was broken during a trailer accident somewhere along the line, was replaced by some totally ugly thing which resembled an HP-14 canopy, and I quickly replaced that with a tinted original shaped canopy. Yes, there are a lot of reflections however dark colored pants and shoes will end most of them...Ventilation is more then adequate, even on the hottest of afternoons.
During assembly, the flaps, spoilers and elevator hook up automatically, the Ailerons have simple "Pip" pins. It is all but impossible to put the elevator on the airframe without it being connected, so there are minimum of worries there. It simply will not go deep enough to seat and install the pivot bolt! I regularly assemble with one additional helper, however 2 extra hands (a 3rd person) makes things go all the easier!
I've not heard of any landing gear colapses, however I can understand how they could occur...The flight manual defines that it is possible to land the ship with the gear up in rough terrain!
A really nice feature on this type is the molded in handle to pick up and rotate the tail end. This is so much easier then trying to lift around a fuse and rotate out of the way!
All up MGW on the 16.5 is 900lbs, while the 18 is, (I believe) 1000lbs, so if you do the math...less water, it is probably one of the lightest loaded of all the original batch of "super ships"!
In the air it is as light, as it is heavy on the ground! My circles are not as tight as some other folks with their 15m ships, however I believe that is mostly my piloting and not the ships doing!
Some other interesting items to note...those wings are extremely soft, and flex extremely far! Once assembled on the field you'll have more folks looking at your ship, and asking you questions, then almost any other ship on the field. There were 3 main versions built by FFA, they include the HBV which had the wings that later became the Libelle (talk about a political nightmare!) the 16.5 and the 18; the 18's are the only version that was never issued a Standard Airworthiness Certificate...
There are also a few which have been notably modified along their life including 2 which grew to 19 meters, 1 which was clipped to 15 meters, one which sprouted a "V-tail" and about 1/2 the fleet of 16.5 have had the 18's wing tips grafted in place. The prototype for the Type, The Ka-Bi-Vo is still flying here in the States, which has the original Ka-6 wing on it. Their is also a self launching, jet propelled version out there somewhere, which was modified by the original designer...Not really that shabby of a life considering only 80 total (all versions) were manufactured...Also of

interest, there has been no recorded accidents from a stall spin with the Type, and as far as I can deternine the have been less then a dozen serious accidents in the type over its' 30 plus year life.
I have also discovered that the soaring community is basicly divided into 2 groups relating to the design, those that love them and those that hate them! There are few who are truly in the middle, with their thoughts....
I guess I've been on the soap box long enough here, I sign off and say that if you still have questions I'd be glad to answer them for you!
My best,
Art

Alex March 29th 2006, 04:18 AM
I had a Diamant 18 from 1974 - 1983. I had about 750 and some odd hours in it. The info from Art on the Glider Forum is good. The 18 had an AD on the spar stubs that limited your VNE until it was accomplished. Most of the ones around had already had the earlier ADs on the flap counterweights and the rudder damper done already by the factory which had a representative travel around and fix them (Fred Jiran). I flew it for a long time and sold it without ever complying with the spar stub AD, because in normal flying, it was rarely necessary to go that fast anyhow. The factory, FFA from Switzerland was still supporting it and provided a kit to accomplish the spar stub AD.
It's a real floater for a glass ship. It has a very good L/D, but it comes at a relatively slow speed. It looks a lot like an ASW-12 and has a similar max L/D, but the whole performance curve is shifted over to the left, so everything happens about 10mph or more slower than the ASW-12. But compared to the 12, it's a much easier and safer ship for ordinary mortals to fly. It has a lot of washout in the wing, which I think is one of the reasons the stall/spin behavior is very good, but this hurts it's high speed performance. This is both good and bad. I think it could still stay up on weak days better than any ship I can think of, even today, except maybe the LightHawk. It would make an excellent contender in the "micro-lift" arena, even today. It has a very slow stall speed and landing speed. You can get it down below 30 knots when thermalling. The real expert on Diamants is Dan Pierson. He used to fly his with as much or more than 70 gallons of water. This would put him even or even better than the ASW-12 and tantalizingly close to some of the big open ships like the Nimbus 2 at the time. Dan still has his 18 and has extended the wing to 19 meters. He had taken up "open cockpit" Diamant flying with the aft part of the canopy removed the last time I talked to him. I don't think you would want to land it gear up, as the fuselage is actually a foam sandwich construction and the amount of glass over the foam is pretty thin and would not take much abrasion. Once you got into the foam, your hind endwould be scraping the surface in very short order, I think.
The rather small size, of the landing gear definitely comes into play when you fly it with that much water. It was a real big risk to takeoff on that gear with that kind of weight. You could only do it at carefully checked runways with no chance of any holes or bumps, and even then, it was a big risk. With no water ballast, the gear is adequate, although on the small side - I think it used the same size hub and tire as a Libelle which was a much smaller ship. I never

flew mine with more than 45 gallons. I considered the 25 gallon difference between me and Dan Pierson as my safety factor, since no formal structural analysis of flying with that much water had been done :-)The wings are big and one piece, but not really all THAT heavy, I mean,esp. compared to a Nimbus 2 or ASW-17 inner panel. The main pin on the spar stub had to be lined up just right with the bearing on the root rib of the other wing, or it just would not go together, and it was a rather bluntly rounded pin, so it was very difficult to visually tell if it was lined up right. I found that it was easier to do it by feel out on the wing-tip. There was a certain “sweet spot” and you could with practice find that pretty easily. When it was lined up in the sweet spot, it would just fall together very easily. But if you were not in the sweet spot, no amount of force would help. It had a rigging lever similar to a Libelle, but that was totally useless.

As far as flying qualities, the flaps are very nice and very effective for decreasing landing speed and help give you a better view over the nose (your feet) when landing. The dive brakes are also very effective and combined with the landing flap position and the excellent view, and the very low stall speed, make it a very nice ship to land. The reclining position is very comfortable once you get used to it. It is very narrow in the cockpit, but pretty long, that’s pretty obvious just from looking at a picture of the ship. The rudder is very heavy on the 18. That is really because it has a very large area, and is driven by a pushrod system and the lever arm that drives the pushrod in the nose is only a few inches long, so the amount of force required from your feet can be quite high just due to the mechanics of the short lever arm. The all flying tail is quite sensitive, but not any more so than a Nimbus 2 or a Std. Cirrus. The ailerons can have a lot of friction, and the forces are high compared to some other designs. The ailerons use these drivers that have ball bearings with races at 45 deg angles to translate the lateral motion of the pushrods to an up and down motion. These can get dry and were usually not accessable because the fittings they attach to the wing by had been filled over with filler. But you can remove the filler and take them appart to clean and grease them. I used to try to spray a light weight lubricant on the bearings but then you get more dirt in there and you can’t get in there and clean it out without taking them apart.

Phil King March 29th 2006, 10:02 PM

I owned a share of a Diamant 18 from 1974 to 1979. It was my first glass glider and I found it relatively easy to fly with few vices. There was a mod to the all moving elevator that some UK Diamants had -- ours did not. The mod was a small extension to the middle aft part of the elevator and was intended to increase the pitch stability. Without this mod the pitch stability is rather poor and in fact stick forces REVERSE at high speeds. To make this clear, the faster you fly,the more you need to hold the stick back! Very weird. If you let go the glider would (presumably) go into an immediate bunt.

However we never bothered to have the mod done and I guess that shows that we did not have any qualms about the handling (or were we young and foolish?).

As others have said the brakes are excellent and extend from the top and bottom wing surfaces.

The canopy opening mechanism and cockpit shape are

very unconventional but caused us no problem. A previous owner did suffer a partial opening of the canopy i flight and flew the rest of the flight one handed while holding the canopy on with the other!
I don’t remember any problems with the rectractable U/C. However I did manage to bend the axle in a firmlanding. So I would say that the U/C is strong enough.
Ours was landed wheels up at least twice. Once ona tarmac runway with a cine camera strapped to the underside. This caused a fair amount of damage. The second time I was the pilot and got away without anydamage on a soft hay field.
I don’t think I have flown a better glider for weak wave. However a modern standard class glider will outperform the Diamant in thermal cross-country tasks.