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Well, Oshkosh '85 is history now. Weather at Oshkosh was good all week, although weather around the country was such that many home-builts didn't get to Oshkosh this year, because of prevailing bad weather conditions in the areas they had to come from. We did have nine Dragonflys attending Oshkosh this year.

I asked three Dragonfly builders who were currently building their own Dragonflys to go over the Dragonflys setting on the line and pick the one that they felt was the best aircraft of the bunch. There were two strong contenders for "Best Dragonfly" and the final choice was built by Malcolm Lovelace of Springfield, Ohio. It was a difficult decision to make. I'm glad that I didn't have to make it. As far as I'm concerned, all the Dragonflys there were winners. I think the average quality of construction on the Dragonflys represented is higher than the average quality on some of the other designs seen on the field.

Dragonfly forums this year were well attended. The Dragonfly builders meeting on Saturday night was well attended. I personally got there about forty-five minutes late. We had to flag a ride back out to the field from a restaurant. Some nice people gave us a ride. The road was closed and rerouted going into the convention grounds, so the driver of the car we were in decided to follow the taxi that was in front of him. We followed the taxi for about twenty miles out into the boondocks, before we realized that he was lost too. He finally turned around and we ultimately found our way to the meeting about 45 minutes late. Gary Specketer, a Dragonfly builder from up in the Minneapolis area, had picked up the loose ends and kept things together. We thank you for that, Gary. Anyhow, weird things happen when you're at Oshkosh.

Another award was given to a Dragonfly builder who had flown the most miles to get to Oshkosh. That award went to Mike Baudhuin who hails from Texas. He is an Air Force pilot, and just been transferred to Germany for a six year tour of duty over there. Consequently, just after building his Dragonfly, he finds that he's going to have to store it for six years. He was lucky enough to find a buyer for it at Oshkosh.

I flew the Prototype back to West Bend, Wisconsin a couple of weeks before the convention, left the airplane there in the kindly care of Ed Dassow, flew home commercial, drove the motorhome and the display back to Oshkosh and then drove the motorhome home again and went commercial back to West Bend again to get Dragonfly.

From West Bend I came down to Alton, Illinois, a suburb of St. Louis and stayed overnight with Dragonfly builder, Jack Hall, putting the first short hop on his new Dragonfly the next morning. His airplane flew very well for a first flight. Had a little pitch problem requiring an excessive amount of up elevator to hold the airplane level. That will have to be adjusted out of it, but other than that checked out real good. I might note here that the whole purpose of a first test flight is just to identify those things which are not right quickly and without endangering yourself or the airplane, so that they can be readjusted. More often than not, a first test flight shows up several things that need adjustment. Sometimes an airplane will go very well on the first flight and require virtually no adjustment, but that's the exception rather than the rule.

On the way to Oshkosh, I had stopped and visited Bill Terry in Guthrey, Oklahoma. Spent the night with him and looked over his pre-fab Dragonfly project. Bill's doing beautiful work on it. It's going to be an exceptional airplane. Bill built his wing as per plans, using the three plys of 7715 Uni and has built his Mark II version canard using the new tri-ply cloth. He is ecstatic about the tri-ply cloth and having had the experience of building with both materials, is 100% enthusiastic about the tri-ply, even though it costs a little more. He says the labor savings is terrific and the finished product comes out nicer.

On the trip home, after I stopped to visit relatives in Oklahoma, went on up to Wichita, Kansas and stayed overnight with John Huston, another Dragonfly builder just getting started up there, although John has been an engine customer of ours for years. Then about six hours hard flying in and out of rain storms and bad weather from Wichita on home here in Eloy.

On the way to Oshkosh, going through Missouri and Illinois and coming back home, back through Illinois, Iowa and down into Missouri, I was forced to fly in and

out of rain showers or wait it out on the ground. Across New Mexico and Arizona, had I not flown in the rain, I just simply couldn't have gotten home. I'd have still been sitting on the ground there probably. The prototype is not adversely affected by flying in the rain. Since I did encounter virtually all kinds of rain from super light stuff to pretty heavy rain, I got a chance to many times observe exactly what happens on the Prototype when going into rain.

The first noticeable reaction when flying into super light stuff; something you have to pay close attention to the canopy to realize you are in rain, is that the nose tends to rise above the horizon. This is going into the rain with the trim set and the airplane flying neutral. The first light rain, the nose comes up above the horizon, as the rain gets a little heavier, the nose starts down below the horizon, then, interestingly enough, if the rain gets heavier, the nose starts coming back up. It never comes back up completely to level again, but it takes a lot less back pressure on the stick to hold it level in a hard rain, than it does in a light rain. I talked with Dick Rutan about this since coming home. He's experienced the same reaction in a Long-Eze and he doesn't know the aerodynamic whys of it either, but it does happen this way. My elevator on the prototype normally flies in trail in level flight and at the worst pitch-down situation that I encounter in the rain, the elevator is below the trail position by about 3/8" out of a total of approximately 1 3/4" travel and the airplane's flying level, under control. Off my cruise speed, I lose about 15 MPH in rain. Stall speed goes up about 10 MPH from totally clean airplane, dry, ideal, best flying conditions to about 10 MPH higher when the airplane is totally bugged up and landing in the rain. No big deal, just a predictable nuisance that you learn to live with if you are going to fly a laminar flow type aircraft. I've got over 5000 hours in a lot of different kinds of airplanes and I'll bet of that 5000 hours I didn't have a grand total of more than 50 hours flight in the rain. Flying in the rain is a very, very minute part of any of our actual flying times and I'd much rather have the kind of efficiency Dragonfly can give you and put up with the rain nuisance than go to the old conventional turbulent flow air foils, give up the high performance 100% of the time in order to get rid of the pitch change nuisance that might at best cost you something in efficiency maybe 1% of the time or less. It seems to me like a pretty good trade off.

I've talked to a lot of different Dragonfly builders who were accumulating a lot of hours and a lot of different piloting experiences in their airplanes and I firmly believe that the differences that we encounter in flying these airplanes in rain and bugged up, are related primarily to two causes. The first one is airfoil on the canard. We've found in doing some pretty precise checking that some builders are nowhere close to the airfoil that Bob designed for the canard! There are a lot of different reasons why the airfoil shape can be screwed up during the building process.

A good portion of my life has been spent in wind tunnel model shops. I don't claim to be an aerodynamicist, but I have built a lot of airfoils to be blown in the tunnels and I know that we had to hold plus or minus .002 on an airfoil shape in order to get information. Some of our builders have errors of as much as 1/4" in airfoil contour and the airfoils that they have come up with simply are not the same airfoils that Bob designed and it's predictable that they are going to behave differently. Since each airfoil seems to be different, each one is going to behave differently. The only way to guarantee that your airplane is going to perform like the prototype, is to really concentrate on producing a faithful, accurate, duplication of the Prototype's airfoils.

The second reason, I believe, that there's a variation in flight characteristics, is center of gravity range. The center of gravity shown on the plans is the range originally used on the Prototype. A lot of different factors determined the position of that center of gravity envelope, among them the incidence of both the wing and the canard, obviously the weight of the airplane and where that weight is located. Also the airfoil characteristics and the interaction between the canard and the wing greatly effect where the CG is going to be finally located. Make note of the fact that I said "finally", because the range shown in the plans is only

the place to start when you begin checking out your airplane. You should fly a good thorough test flight program and explore the CG range to find out where it should be in your airplane. It may be that the limits on your airplane will be quite different from the limits on the Prototype, and that can only be found out by flying a careful test flight program to determine the CG limits.

If this equal span canard plan form is loaded too heavily on the canard, it will fly well, but when you get into rain and bugs, the canard starts losing efficiency proportionately faster than the wing does. Consequently, it pitches down. If the airplane has the center of gravity located in the proper place however, the pitch down tendency can be 100% handled with available elevator authority and still leave you a comfortable, safe margin of up elevator to use when you are slowing the airplane down in approach and flaring it out for landing.

I've talked to a couple of educated Dragonfly builders, who have some kind of computer program that they are using to place the CG in their Dragonfly correctly, according to the program. They try to tell me that the airplane will become divergent (become uncontrollable), depart from controlled flight, if you start moving the CG aft.

I'm not sure how many Dragonflies their computer program has flown. I do know that at this point in time, I've put between 800 and 900 hours of time in a Dragonfly. I've flown seven of them so far. I've flown a couple of test flight programs where we moved that CG way back until it did become very unstable on the pitch axis, but at no time was I ever able to get the wing to stall, as their computer program predicts and scares the hell out of them. I have found in actual test flying situations, that the first evidence of the CG being too far aft, is the pitch phugoid going neutral at the red line end of the speed envelope. If you were then to move the CG even farther back, it will become progressively more unstable. Even with the CG a long way back, the airplane is stable and responsive at lower speeds.

The bottom line on all of this is to say that you must, absolutely must, fly an intelligent, well thought out flight test program on your airplane to find out the performance limitations and behavior of your particular airplane, because your Dragonfly is not going to be exactly like anybody else's Dragonfly in the whole world. If you fly this test program properly, you can learn and chart the airplane's behavior, make the proper corrections, and the end result will be a predictable aircraft that doesn't have any surprises for you. It takes a little time to do this sort of thing, but that's what your restriction hours are meant for. You're supposed to be finding out how this airplane flies. It is an experimental aircraft, you are the manufacturer, and it's your responsibility to find out how your aircraft will perform in a given set of circumstances. Anything that could possibly be construed to be within the normal flight envelope of the airplane, should be explored and documented.

If your flight experience is not such that you can perform tests such as these without a great deal of personal anxiety, or if you feel like you are getting in over your head, taking too many risks, back away and let somebody with experience do it. I can do a pretty good job of picking out a splinter with a needle, but I wouldn't try to do brain surgery, I'd get somebody with the experience. So don't be ashamed to recognize your own limitations and DON'T DO NOTHIN' STUPID! Stupidity can be a terminal disease when it happens around airplanes.

MORE ON TEST FLYING

One of the things we have set aside considerable time for at the Dragonfly Swarming to be held here in Eloy, the 11th, 12th and 13th of October this year, is a lot of time for forums on test flying. We keep placing heavy emphasis on this because we know from experience this is the area where a builder is most apt to stumble and break his pretty new bird. We don't want that to happen and neither do you.

Dragonfly is a very high-performance airplane and many of you builders have never been in a high-performance airplane until the first time you get in your Dragonfly. Your previous experience, even though you may be very good pilots in what you've been flying, hasn't necessarily prepared you for coping with the high-performance airplane.

Dragonfly gains speed very quickly and gives it up very slowly. We note that our builders who have had problems, breaking canards and such, do it in the first two or three flights usually and if in fact they do get through the first two or three flights, they probably will never break anything. This is the reason that we've placed so much emphasis on getting you guys to come out here and get checked out in the Prototype before you try to fly your own airplane. It's not that the airplane is hard to fly, it's merely different and for the most part

the experience levels that our builders seem to have has not prepared them to make the quantum leap in performance and efficiency that they make from say a Cessna 152 to a Dragonfly. Flying a Cessna 150 prepares you to fly a Dragonfly in about the same manner that driving a tractor prepares you to drive a Ferrari at LeMans. Dragonflies have been flown by some very low time pilots and some very high time pilots, but just like any other airplane, the easy way to get into it without complications is to get a thorough check out in it. That means coming out here to get the free check out, or getting with some other Dragonfly builder who's already flying. If you can't do either one of those two, go back through all the newsletters, get on the phone to me, do whatever is necessary, but do program yourself to be as much aware of what you're going to encounter as possible before you get into the airplane.

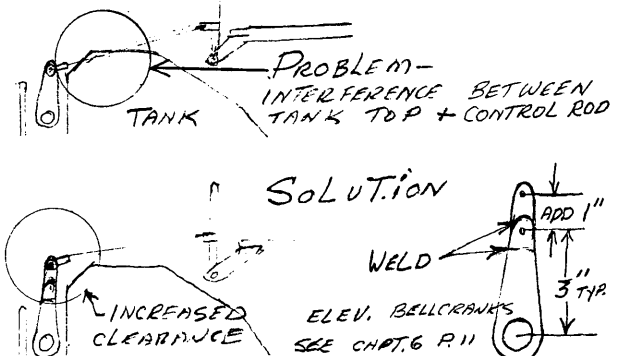
PREFAB DRAGONFLY FLYING

Tom McCutcheon of North Bend, Oregon, reports that as of the 18th of July he had 10 hours on his new prefab Mark II Dragonfly. I understand that the airplane is set up for full IFR. Tom has made some minor modifications in the control system and wound up with a little too much slop in the elevator linkage and had to go back and modify that. Tom brought something to our attention that should be noted by those of you building the Mark II modification. The gear legs furnished in the Mark II mod kit are of uni-directional fiberglass structures and must be sanded on the outside to remove all traces of residual parting agents that may still be on them. The corners have to be rounded and they MUST be wrapped with two layers of ten ounce bi-directional during the construction process. Failure to clean the legs so that the bi-directional will bond, or failure to add enough layers of bi-directional will result in a substandard gear leg assembly.

MARK II BUILDERS ONLY

It will be necessary to make a minor change in the elevator horns as per the sketch here. The reason for this change is that when the anhedral is taken out of the canard the elevator torque tube assemblies wind up much closer to the bottom of the airplane. The elevator horns must then be made longer in order that the pushrods connecting the control sticks to the horns do not interfere with the top of the gas tank. Those of you building your own hardware can simply extend the length of the elevator horn a little bit, per the sketch. Those of you who may already have Ken Brock hardware, can extend the length as per sketch. It has been noted by some builders that even on the Mark I, in some cases there has been interference between the elevator pushrod and the top of the tank. The Prototype Dragonfly does have a couple of grooves in the top of the tank to make clearance for the elevator pushrods between the center stick and the elevator horns. It is acceptable on all Dragonflies to increase the length of the horns, per the sketch, if it'd make things fit a little better for you.

The result of this change is that a little more fore and aft movement is required of the stick to produce full elevator travel, but due to the fact that the airplane is quite sensitive to elevator movement, this is felt to be on the positive side rather than a negative side effect since it gives you greater authority over the elevator and requires greater movement of the joystick to produce the same reaction on the elevator. Pilots used to flying spam cans are very prone to over-control the Dragonfly on the pitch axis when first getting in it.



FLY-IN SCHEDULE

As of the moment, barring any unforeseen developments, such as bad weather, we plan to attend the Brown Field Fly-in in San Diego, the Copperstate Fly-in here in Arizona and of course our own Dragonfly Swarming.

DRAGONFLYS' NEW ENGINE

Two newsletters ago, we announced that we were replacing Dragonfly's original engine with a new engine equipped with hydraulic lifters. Other than that the new engine is a duplicate of the old engine. The old engine when removed had a little over 800 hours on it, was due for a valve job, but the bottom end was as good as the day we put it together the first time, and would have required no maintenance. We did rebuild the engine to 0 time tolerances and sold it at a reduced cost to another Dragonfly builder, so it'll be flying again one of these days.

The new hydraulic lifter equipped engine, I believe, has been the best thing and the most significant development that we have ever put in to Volkswagen engines. Since the day the engine was installed in Dragonfly, five months and 106 flying hours ago, the rocker covers haven't been off of it, we haven't had to adjust anything, not even once. The hydraulic lifters automatically compensate for the expansion and contraction of the engine, maintaining perfect valve adjustment at all times. The most obvious benefit of this has been felt in compression in the engine that keeps getting better as the engine gets more hours put on it. It started out real good and now it's super solid. We've also been flying a hydraulic lifter equipped engine in Cygnet with exactly the same results.

The hydraulic lifters can be put in any Type III Volkswagen case. They do require some pretty close tolerance machining in the case to accept the hydraulic lifters. The cam must be changed. We've designed a cam with a special profile for the hydraulic lifters and the lift/duration and dwell has been engineered to give us the torque characteristics that we must have to produce the most power down 3000 -3500 RPM range.

You builders who are building your own engines, may send them in and we can machine your cases and provide the total hydraulic lifter package, which includes the lifters, the cam and the pushrods. These things are all different from stock Volkswagens. The total cost to you is \$250.00 plus transportation costs. If you're going to have to buy a new aircraft grind cam, solid lifters anyway, the added cost really isn't much at all. If you're already flying a Volkswagen engine, you will be maintaining the tappets and if you are tired of that, the first time you have the engine out of the airplane and down, send us the case and we can redo that. I really feel that this is the best thing we've ever done in a Volkswagen engine and the biggest single stride we've ever made towards the ultimate goal of a near no-maintenance engine. In the last 106 flight hours, I haven't done anything to the engine, except add a little oil.

MAGNUM 75 ENGINES FOR DRAGONFLY

By the time you read this, the first of the Magnum 75 engines will have been shipped. We installed the original production prototype, of the Magnum engine, in our Cygnet. It flew to Oshkosh and back this year, plus wandering around over the western half of the United States. Had absolutely zero problems with it. Does it produce 75 real honest-to-goodness horsepower? The answer is emphatically, Yes! Not BS horsepower, but horsepower that's real and horsepower you can measure and more importantly horsepower that you can get on an hour after hour basis without doing anything destructive to the engine.

Cygnet, with the 60 horsepower 60-2DM (same engine we've always recommended for Dragonfly) cruised at 3500 feet AGL, 100 mph, had 3000 rpm, used 24 inches of manifold pressure and on a sustained flight would burn 3.57 gallons per hour.

Cygnet now cruises at 3500 feet AGL, 100 mph, at 3000 rpm, with only 19 inches of manifold pressure. This tells us that the engine is producing as much power at 19 inches of manifold pressure as it used to produce at 24 inches of manifold pressure. The rate of climb has gone up about 200 feet a minute on Cygnet. Top speed is only increased by 7 mph, but bear in mind, this is a very draggy airplane that's not going to go too fast, no matter what kind of power you put in it.

We hope to have the Magnum heads on Dragonfly's engine by the Swarming, but may not make it simply due to the fly-in schedule we're obligated to make. There may not be enough down time to allow us to accomplish the head change, put on an Ellison fuel injector carburetor, which means a change in all the throttle control and mixture cables. The domino effect always works in airplanes, you change one thing and it means you've got to change 10 other things.

The Magnum heads will retrofit on any Volkswagen engine, based on the Type III crankcase. They'll fit all of our engines, that we've previously built, Monnett's engines, Revmaster's. They'll fit any of them, and it's

a simple bolt on application. When you buy a set of heads, you get everything necessary with the heads, except the intake manifolds to make the change over, such as new hold down studs, new pushrod tubes, new heads, of course, (all loaded with valves and everything, ready to run), all the nuts and bolts and goodies you're going to need. The intake manifolds are not included in the head price, simply because there are three different styles of intake manifolds to fit the different kinds of airplanes, so we're pricing them separately. On the average, it's going to cost about \$1,000.00 to make the changeover from the stock heads to the Magnum heads, but you're going to get a real 75 hp for your money. Enclosed in this newsletter is a piece of literature on the Magnum heads so you can take a look and see what you're getting for your money. If you want a Magnum engine or a set of Magnum heads, place your orders now, because we are already backed up on these things. If you want early delivery, get an early order in. I would very strongly suggest that when you put on Magnum heads, put the hydraulic lifters in at the same time and you'll wind up with a powerful, sweet running engine that you won't waste any flying time laying wrenches on.

EASY FILLING TECHNIQUE

I'm almost afraid to tell you about this one, it's so simple. Everybody, including me, says, "Why didn't I think of that before?"

You can save yourself an awful lot of time in filling the weave on the wing, canard or any of the flight surfaces or on the fuselage, (for those of you who are building from plans,) with the simple dry micro technique that we tried while prefab builder Zeke Smith from Saratoga, CA was here.

It goes like this, when you're laying up your wing or canard or whatever, do the wet out, lay up, squeegee it out in the normal manner, but before you peel ply, get a two pound coffee can and put a lot of holes in the bottom of it (tiny holes, about 1/64th of an inch in diameter), fill it up with dry micro, no resin at all in it, just pure dry micro right out of the bag and after you have finished squeegeeing it, shake dry micro over the whole surface of what you have finished squeegeeing. Put a layer about 1/8" thick over the top of the whole lay up. The dry micro by capillary action will pull up a certain amount of resin out of the layup, enough to fill up all the little depressions between the weave so that when you come back to it the next day after it is dry, you can sweep up the loose dry micro on the top of the lay up into a pile, put it back in your shaker sieve, shake it back into the bag to take out any lumps.

Then you just take your dry sandpaper, do a little light sanding and presto, you've got a nice smooth surface on the parts you've just laid up that you don't have to squeegee any micro on to fill the weave. Easy, huh? Like I said, I don't know why we didn't think of it before, guess it's because it's too simple. Try it, you'll like it!

THE CHANGING HOMEBUILT SCENE

On July 13, 1985, Burt Rutan announced to the world through the Canard Pusher Newsletter, that Rutan Aircraft will no longer sell plans for any of Bert's designs.

Burt has single-handedly changed the course of aviation with his innovative thinking, unconventional but super efficient designs, use of new methods and materials in the construction of aircraft, and in methods of marketing to and supporting the homebuilder. In the process of the last 15 or so years, Burt has probably put more working hours in than most people will work in a lifetime. He has designed, built and tested five homebuilt designs, the VariViggen, the VariEze, the Long-EZ, the Solitaire, and the Twin Engine Defiant. He's also done a lot of contract design work for other people, among them, Fairchild Aircraft, Beach Aircraft, and Colin Chapman of England.

Burt has been probably the single most successful homebuilt designer to ever come on the scene. Why then, did he choose to get completely out of homebuilts?

I've become acquainted with both Burt and Dick Rutan over the past few years and have had a lot of help from both of them at various times. I have talked with Burt in the past about the problems a homebuilt plans seller faces and I think I have become somewhat aware of his thinking.

The prime reason for starting any business is to make a profit. Profit is to a businessman, what a wage is to man who works for someone else. The big difference is, when starting a business like a homebuilt aircraft business, there's a tremendous amount of work involved and a lot of expense before there's any possibility of any profit or even any income.

There is a very erroneous belief in homebuilding

circles that the designers are getting rich from selling plans. That's totally untrue. A designer is very fortunate if he can make any profit off of selling plans. After the first flurry of sales on a new design, the designer is very fortunate if the total amount of plans sales will cover his advertising costs. Most designers either sell components for their own airplanes, thus making whatever living out of the design possible, or they find a reputable supply house, arrange for them to stock the many and often times unique components called for in their design, then the supply house pays the designer a very small commission on each parts sale for that design.

The designer is obligated to the builders then to continue builder support for who knows how many years, while the builders are building that design. Some builders may take as long as ten years to build an airplane. One of the things that has helped to shape Burt's decision to get out of homebuilding, I'm sure, is the discounter.

You'll remember about two years ago, the big 7715 controversy, brought on by a discounter from West Texas selling a bogus imitation 7715 cloth, that was not and is not equal to Hexcel's 7715. That discounter told you builders that you were being ripped off by the designers, they're making fantastic profits on these materials the designers want you to buy in the form of designer royalties that are paid back from the material.

I've been in this business seven years now. I have yet to meet the first rich aircraft designer. In fact, I don't know any of them that are really making a good living when you reference their income against the amount of work they have to do to get it and their investment.

Lately, all the designers are taking a good hard look at their position and deciding if whatever income they make is worth the hassle of staying in this business. Liability didn't used to be a problem, because the homebuilder knew that he was responsible for his own airplane and responsible for his own mistakes. Recently the ambulance chasing lawyers have been filing so many nuisance suits against homebuilt designers and manufacturers that those of us who are still in business are beginning to wonder "Is it worth it?"

Nobody who ever sued a homebuilt designer or manufacturer of homebuilt parts has collected anything in a court of law. The law says that the builder is the manufacturer of the airplane. He's responsible for the airplane and that's always been upheld in court, so far. However, our law is such that if a designer or manufacturer gets sued, he must spend a lot of legal money to defend himself to get it into court so that the issue can be decided by a judge or a jury. The high cost of defending against these suits is simply more than small firms such as are involved in homebuilding can absorb and remain in business. Consequently, look around the magazines, you see a lot of companies that were in business a year ago that are no longer in business now and you're going to see more of them go down the tubes. Plain and simple fact is, there is no big money for the designer or the hardware manufacturer in this business. The deep pockets that the lawyers are always looking for simply don't exist.

So what do you do when you're in a business that's not particularly profitable, where there is potentially the exposure for a lot of idiotic liability lawsuits and you can take that same talent, that's not making you any money in this business, and sell it in some other business and do quite well with it? Obvious, you get out of the homebuilt business. That's exactly what Burt has done. I understand his reasons completely and while the loss to the homebuilt community is a great one, I believe Burt has done the right thing for himself. I hope that through the sale of his time and talent in the commercial side of aviation, Burt can indeed make the kind of income that people thought he was making in homebuilts. I'm sure Burt will go for that too.

My family and I have been in this homebuilt aircraft business for seven years now, working very hard at it and making a modest living at it, with a considerable investment in time, tooling and cash. We've never had anybody lodge a liability suit against us, in fact, we've had very few incidents that could have resulted in a liability suit. I don't know if we've been just plain lucky or perhaps some of the counseling and cautioning that I do in this newsletter concerning how to do things right the first time, 'Don't do nothin' dumb', giving pilot check-outs here; ranting, raving and wrestling with some of you guys to keep you from getting into a situation where you might get hurt. Perhaps that's one of the reasons. I simply don't know. I do know that we intend to continue with both Viking and HAPI. We're going to continue to do our level best to get you to build good airplanes, to get you to get the proper pilot

training and knowledge to fly the airplane safely before you get in it and then to get you to check out the airplane and prove in the restriction hours that you do have a safe airplane, without endangering yourself or anybody else in the process.

NEW POLICYS AT VIKING

It will be mandatory that all Dragonfly builders seeking builder support from Viking have a current subscription to the Dragonfly Newsletter, as this is the only formal means of distributing mandatory changes.

Builder support calls will be taken between 3:00 and 5:00 in the afternoon on weekdays only and the builder should expect to have his newsletter subscription verified by a secretary before the call is transferred to me. It has become very apparent in the last few months, that I am spending hours and hours on the telephone trying to verbally describe to builders how to do something that has been detailed, (many times including sketches,) in previous newsletters. This kind of thing keeps me from accomplishing a lot of work that I need to get done and is a terrible financial drain on Viking Aircraft. We simply can't allow it to continue.

Those builders requesting builder's support by mail must include a self-addressed, stamped envelope with their query and please write your questions simply and clearly and leaving space on the paper for me to answer. We'll try to answer promptly and concisely and this will help us a great deal in helping you.

We plan to continue with the pilot check outs and encourage each and every one of you Dragonfly builders to come here and get checked out thoroughly before you attempt to fly your own Dragonfly. We are going to have to make some changes in this area, however, based on what past experience has taught us. I have attempted to check out some pilots whose proficiency level was pretty low, primarily, I believe, due to lack of recent flight experience, particularly in taildragers. In the future we will insist that you arrange to go next door to Frank Stezler, who is a certified flight instructor and has a Citabria available and can check you out in taildragers.

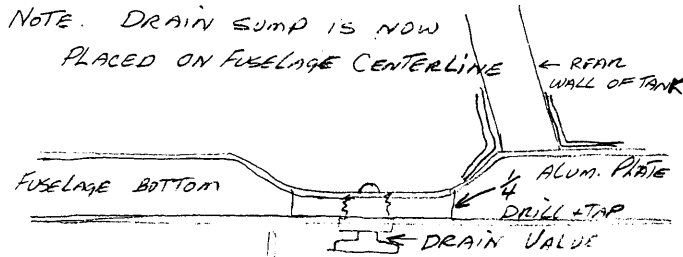
I have programmed Frank to prepare the potential Dragonfly pilot by making him fly Frank's Citabria in the same manner that a Dragonfly must be flown. When Frank says you're ready for solo, I'll be more than happy to put you in Dragonfly and get you some first hand piloting experience in a Dragonfly, but I simply can't spend more time giving basic flight instruction to people who aren't quite ready to fly the airplane. Those of you who are not current and need bi-annual flight reviews, that sort of thing, can be brought up to date with Frank at the same time he's checking you out to get into Dragonfly. Frank has a special offer available that I believe is a very good deal. He offers four hours dual instruction flight time in the Citabria, plus some ground school and oral examination. The builder will also receive a fresh bi-annual flight review. Anybody should be able to completely master a tail dragger with this amount of instruction. Total price, \$285.00. Those of you coming to the Dragonfly Swarming who want to take advantage of this, call Frank directly and arrange scheduling. Area code 602, 466-7216.

The above may seem like we're getting tough, but this is a tough business and the survival rate on homebuilt aircraft companies is pretty dismal. We intend to survive. We are open, every day of the week from 8:00 in the morning to 5:00 P.M. Our builders are always welcome here. If you have parts or assemblies that you would like critiqued, bring them along and we'll be glad to take a look at them.

PLANS CHANGES: GAS TANK FUEL DRAIN VALVE

The gas tank fuel drain valve is being relocated and placed on the centerline of the aircraft at the rear most portion of the gastank. A channel is to be cut and shaped in the bottom fuselage foam core that creates a recess at the centerline of the aircraft, rear most portion of the gas tank. The object of this recess is to create cavity that is the lowest point in the gas tank with the aircraft sitting tail down and level. Any water that might be introduced into the tank through fuel contamination, while washing the aircraft or by any other means will then collect at this point and can be drained out and should be checked in the pre-flight procedure. Those of you building prefab airplanes who already have a recess at the seam line merely relocate the gas tank drain valve. WARNING: On Dragonflies currently built and flying, a periodic check should be performed with the airplane blocked and tilted in such a manner that your fuel drain valve is certain to be the lowest point in the tank. Then drain and inspect fuel for water contamination. FURTHER WARNING: All Dragonflies should be equipped with a gascolator on the fire wall, between

the header tank and the carburetor. Any water entrapment that might be present in the fuel will then be collected in the gascolator before reaching the carburetor. Fuel samples should be taken from the gascolator routinely as part of the pre-flight procedure to check for water or other contamination.



brakes. Replace linings if worn excessively. Check bearings for wear, replace if necessary. Replace tires and tubes if worn excessively. If hydraulic brakes, refill reservoir. Check all control systems for excess wear or slop in system. Replace or readjust as necessary. Check all control surface bearings for wear and play. Check tail wheel bearings, relubricate, replace tail wheel if worn. Drain gas tank dry, check for foreign matter and or water contamination. Replace fuel filter between main tank and header tank. Check all electrical wiring for security, chafing, wear. Repair or replace as necessary. Test run engine before reinstalling cowling. Fill out engine, propellor, and airframe log books to document maintenance and or repairs performed. Test fly to verify safe flight status.

THIS YEAR'S DRAGONFLY SWARMING

We've planned to make this year's Dragonfly Swarming heavily oriented toward workshops, to pass on new builder techniques and such that have been developed here at the school to our builders who are building at home. There will also be heavy emphasis and forums on getting the airplane and yourself ready for test flying and then how to properly conduct the test flight stage of getting to know your Dragonfly. Following is a schedule of events as they will happen:

Friday Morning:

1. Lay-up Shear Web On Wing Center Section

Friday afternoon:

1. WORKSHOP @ Jig Canard Core For Spar and Top Skin
2. FORUM @ Inspections necessary during building, aligning wing and canard, pre-flight inspections, tests.

Friday Evening:

1. No Host Builder's Get Together at Pizza Parlor

Saturday Morning:

1. WORKSHOP: Nose Section on Wing Core
2. Prepare Canard Core For Upper Spar & Top Skin Glassing

Saturday Afternoon:

1. Lay Up Canard Top Skin & Spar

2. Continuous Test Flying Forums

Saturday Night: 1. 6:00 - 7:00 No Host Happy Hour at Eloy Lions Club
2. 7:00 - ? Carne Asada Dinner (\$6.00 per person) Make reservation by 4:00 PM Saturday afternoon.

Sunday Morning:

1. WORKSHOP: Turn over and re-jig canard - jig wing for glassing bottom skin and spar.

Sunday Afternoon:

Builder's Q & A Forum

Those of you who plan to pick up parts for your Dragonfly, engines and such as that, while you are here can greatly increase the chances of getting the things that you need and carrying them home with you from the Swarming if you'll call and order them ahead of time and pick up the order while you are here.

We do plan to have a whole bunch of goodies available at discounted prices, some of it old stock and some of it blemished merchandise, so there will be some bargains here this year for you guys that are interested, at an 'all sales final basis'.

Those of you who want can bring your motorhomes, or camping trailers, tents or whatever, you are welcome to put your vehicles right here on the airport, no charge of course. The motels listed below will take reservations for the Swarming. Golden 6, 466-7374 and the Albertan Motel, 836-8376 are both inexpensive, about \$20.00 a night for a couple and the Ramada, 836-5000 is a little more expensive at about \$27.00. Ground transportation will be provided for those of you who fly, at no charge. Hope all of you guys with flying Dragonflies will make it this year, if possible.

DINNER RESERVATIONS

Dinner this year will be at the Eloy Lions Club, as it was last year. The Lions are catering the thing this year and we do need to know as soon as possible how many people we'll be feeding. Enclosed find a little reservations form for dinner on Saturday night. If you plan on dinner, please send your checks and reservations in early, so that we'll know how many we're going to feed. We look forward to having all of you here, we hope that you have as much fun being here and enjoy our company as much as we enjoy yours.

CHECK FUEL FILTERS

Many builders do not get the fuel tank completely free of sanding dust and other foreign matter before closing it up and some have experienced contamination in the fuel system, therefore, 1- Completely and thoroughly clean the fuel tank before closing it, so that not one particle of anything remains in it. It must be absolutely, spotlessly clean before the two closing plates are added. After the tank has been filled with fuel, it is extremely important to check the fuel filter between the main tank and the header tank many times during the engine testing, taxi testing and pre-flight testing on the aircraft to insure that the fuel system is absolutely clean and functioning perfectly before any attempt is made to fly the aircraft.

After the system is found to be free of contamination, a routine inspection of the inline fuel filter between the main tank and header tank is recommended every twenty-five flight hours.

45% of all homebuilt "engine failure accidents" are caused by fuel system related problems; running out of fuel, taking off with not enough fuel, switching to the wrong tank in flight, switching the fuel off in flight, fuel system contamination, water in the fuel. All of these things can be totally avoided, by thorough checking on the ground, good pre-flight procedures and good in-flight procedures.

Plans change - Wicks Aircraft Company has informed us that the 15/16 diameter 4130 steel tubing, called out in Chapter 7, Page 13, is no longer available. This is a piece of tubing that slides over the pultrusion

tailspring, when you fabricate your own tail wheel. The tail wheel spring has been increased in size from the original pultrusion. The alternative for 15/16 diameter is to go to a 1" diameter 4130 tubing, 1/16 wall. If you have the early pultrusion, wrap two layers of 10 ounce bi-directional around the tubing to increase the cross sectional area creating a good fit on the 1" diameter tubing.

CONDUCTIVE PAINT

Wicks Aircraft Supply Company has sent us a sample can of a product called Spray Lat, conductive paint, that can make antenna installations on Dragonflies very easy. When installing a vertical whip antenna in the tail cone, as described in previous newsletters, Spraylat can be sprayed inside on the fuselage bottom to create the ground plane necessary for good antenna performance. The product may also be used to create the two legs of the VOR antenna, by simply masking off the proper length antenna legs as per the plans, Chapter 5, Page 3, and then spray painting the conductive legs.

I'm sure the creative Dragonfly builders that are electronically oriented will figure out lots of ways of using this product in antenna systems. Wicks stocks it. It sells for \$29.95 for a 9 3/4 oz. spray can and that's real cheap compared to the price of antennas.

100 HOUR INSPECTION

Clean and adjust all spark plugs. Check ignition timing (should be 28 B.T.D.C.). Retorque cylinder head bolts - 23 ft. lbs. Readjust tappets - .006 intake - .008 exhaust. (Solid lifters only, does not apply to hyd. lifters). Clean and inspect gascolator. Clean battery terminals and check fluid level in battery. Change crankcase oil (recommend Amsoil 10-50W racing oil). Check and retorque all prop bolts - 16 ft. lbs. torque. Check prop for cracks, knicks, or other damage. Check spinner and back plates for cracks and defects. Check all areas of engine controls systems, air induction system for wear or damage. Clean or replace air filter. Lubricate starter bearings. AIRFRAME - Remove wheels and



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