

DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

THE OFFICAL VOICE OF DRAGONFLYERS ALL OVER THE WORLD

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GRAYSON STARNER OF SARANAC LAKE, NY MAKES HIS FIRST FLIGHT IN HIS MARK II

Hello Spud

I finished up building and made my first flight in N3175D in the middle of March. I was in a hurry because I was scheduled to move to New York, so I flew my forty hours off in two weeks.....I don't recommend doing it this way. It doesn't allow enough time to ponder, tinker, improve and enjoy the process. To my pleasant surprise the plane has performed very well with a minimum of adjustments. In early June of this year I flew 75 Delta to our new home in Saranac Lake,

New York from Houston, Texas. Again the plane and engine performed well with the exception of having to fly thru rain and the trim changes that it causes, a condition that we are all familiar with. The trip was just under 1700 miles and has reinforced my confidence in what a great little airplane it is! I will be flying my Dragonfly to Ottawa, Kansas this Labor Day to attend our annual fly-in and hope to see everyone there.

Grayson Starnier - Saranac Lake, New York
(all right! a long distance contender!)

Another Ignition Option

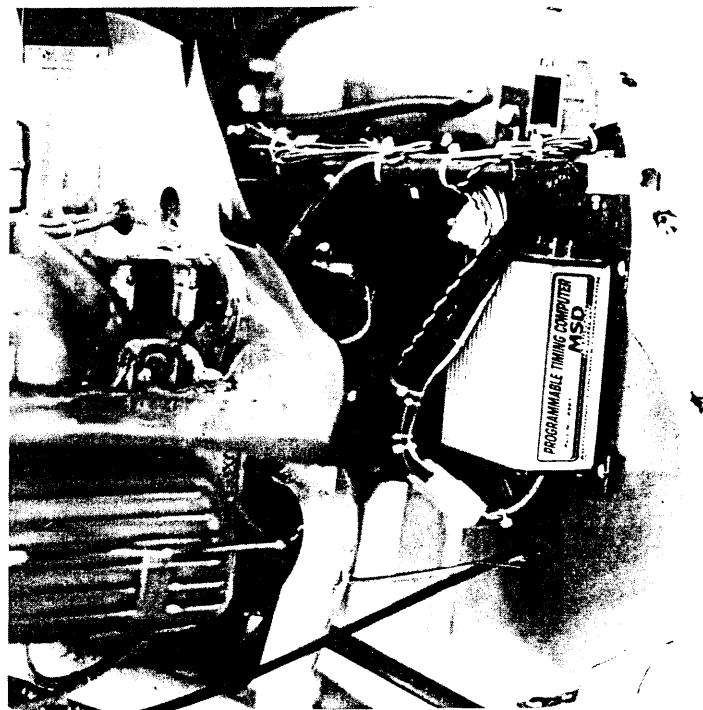
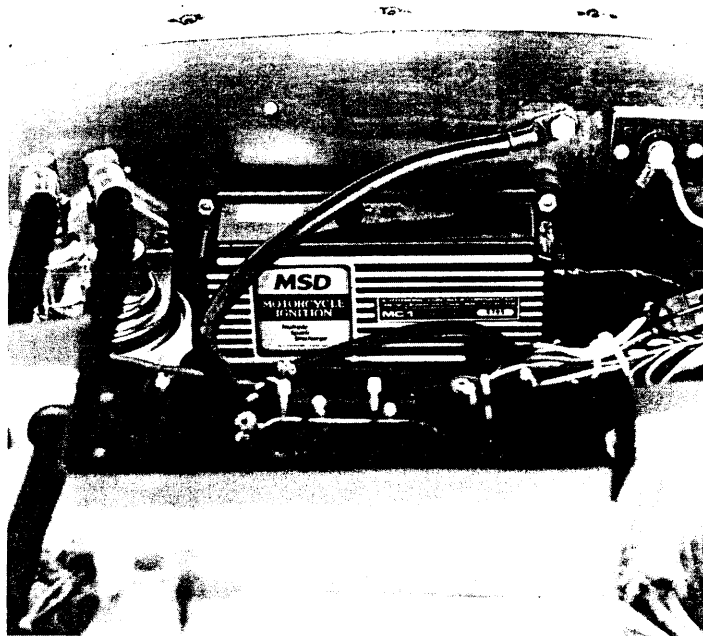
Well, Spud, I am finally getting around to writing. I thought the troops would like to know what I've been up to with old N48RV which I bought from Bob Violet in March of 93. You may recall that Bob was one of the early Dragonfly/flyers. Bob's plane was a plans built Mark I with a Hapi 1835 that I've changed to a Mark II with a Great Plains 2180 and most of the popular mods. It's a good flying bird with a cruise 140 mph indicated without wheel pants (you'll get 10+mph when you put the wheel pants on), empty weight of 710 lbs., climbs around 650 fpm solo.

One of the things I've done that may be of interest to others is the secondary electronic ignition that I've added to my plane. Actually, what I really wanted to do was buy an off-the-shelf unit that I could just bolt on, but with a \$700-\$1000 price tag, I decided against it. Since I make my living in the electronic repair business, I decided to build my own. After several weeks of burning a lot of midnight oil and not being satisfied with the results, I took a different approach. MSD ignitions out of El Paso, Texas, makes a complete line of ignition systems popular with the big buck racers. After looking at their product line, I was disappointed to find that they didn't have what I wanted, however, they did have two individual parts that although were not compatible with each other in stock form, if somehow they could be modified to work together I would have the ideal system. Well, designing an interface circuit to get these two parts to talk to each other was not that difficult. Within a week I had the system working on the test bench. One nice thing about MSD parts is that they are compatible with the Hapi trigger unit that plugs into the distributor hole. It is also compatible with the original coils. Installation of the unit into the airplane took about three hours. As luck would have it, the only convenient place to mount the computer was behind the left rear exhaust pipe on the firewall. The ignition unit itself is mounted above and behind the mag on the firewall. My installation is probably worst-case scenario, as there is no heat shielding or blast tubes and after 50 hours the unit has worked flawlessly.

The benefits in using this type of ignition are:

1. Complete control of timing. The timing computer has 3 adjustments for timing; initial(start up), rpm, and slope. Setting these adjustments is easy and takes about 15 minutes.
2. Much less current drain, the Hapi system would use 6 to 7 amps off of the system buss regardless of whether the engine was running or not. The new system uses less than 4 amps at 3500 rpm and less than a 1/2 amp when the engine is off.
3. The ability to automatically advance the timing at altitude

by sensing manifold pressure which increases engine efficiency. Also the ignition unit has a plug-in rev limiter which will limit max rpm.



The system is RF EMI free and does not interfere with my radio and of course I can now start the engine on the electronic ignition alone which produces a much hotter spark than the mag, especially at cranking speed.

ANTENNAS!

Well, you may ask, "how do you like the system after having it for a while?" The answer is I like it a lot. After it was installed and adjusted I haven't had to touch it, although I don't have the advance at altitude feature installed yet. I'll have it installed in the near future. Because of the electronic advance, I can run about 6 degrees more total advance than the 25 degrees the mag runs so I feel that the engine develops a little more power. I am seriously considering installing another system and retiring the mag; however, this would have to be carefully thought out total system with battery redundancy. Well, that about does it. If there is any interest, I'll be glad to help others and although my system is on a VW, it would work just as well on any other horizontally opposed 4-cylinder engine using a crank trigger set up. The best prices I've found on MSD parts are from:

Summit Racing - Phone #(216) 630-0200

MSD Timing Computer P/N# 8981 at \$156.00

MSD MC1 Motorcycle Ignition P/N# 4210 at \$183.69

As I've said, the timing computer has to be modified, they won't work together right out of the box. I anticipate a cost of \$80.00 to install the interface board in a timing computer. For those that are able to install their own interface board, figure approximately \$50.00 for the board itself.

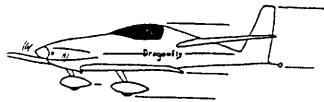
I'll be attending our big annual fly-in this Labor day weekend in my Dragonfly. If anyone has any questions about it I'll be glad to answer all I can. See everyone at Ottawa.

Mark Snow

704 No. Third

Carlsbad, NM 88220

(505)885-9105 day/evening



BUILDERS TIPS

● Let's go to school

I just hung up the phone with another builder that is completely unfamiliar with angle of incidence and some of it's terminology! The area that we are going to talk about here is where everybody seems to get goofed up. And that is what is positive and what is negative angle of incidence! Of course we must assume a water line running through the longitudinal axes of the airplane. Remember this; When ever the leading edge is higher than the trailing edge, the angle of incidence is said to be positive. The angle of incidence is negative when the leading edge is lower than the trailing edge.

Hi Spud

At last years fly-in I had quite a few of the builders ask me how I did my antenna installation, I thought it would be a good idea to share this information with all the builders.

I used the 'hidden antenna's' that were described in several articles that have been written over the years by Jim Weir of RST. I figured as long as I was building wings, I might as well add all the antenna's that I might ever need, so I put a communication antenna in the vertical fin, a VOR navigation in one wing, a marker beacon and glideslope in the other wing, plus a second communication and a second navigation in the canard. I know that I'll never use all of those (currently using one Com and one Nav), but it's just too easy to put them all in while your building. RST sells antenna kits for a very low price. I bought a bunch of them and just put them all in.

A friend of mine building a single place Quickie, decided not to put his antenna's in the wing, only to change his mind after the wing was already glassed (what a pain!!). If you have a chance, I'd say put them in!!

Performance: I have had no problems with my antenna's (at least so far!). The only problem I have is my Terra radio puts out to much power when I am in close proximity to someone. I can hear fine, but people have trouble understanding me. So whenever we fly in formation, I just use my handheld to transmit and everyone can hear me just fine. While on a cross country last month, I tried to just use the handheld to call approach, and they couldn't hear me until I went back to my regular radio. So I think everything is working just fine.

I look forward to seeing everyone again at this years fly-in.

Paul Fisher

Taylor Ridge, IL

Q-200 N17PF



Hello Spud

I have a lot of the builders ask me about my antenna installation and I have had very good luck with the performance so I would like to share it with all the builders.

I have seven antenna's: 2 COM's, 2 NAV's, 1 XPONDER, 1 MARKER BEACON and 1 LORAN. I will describe all seven.

COMUNICATION ANTENNA'S:

THE PRIAMRY COM ANTENNA is a commercial broadband unit located about 25 inches aft of the wing drag bulkhead on a ground plane made of aluminum window screen. The aluminum screen should be at least fifty inches by fifty inches with the antenna mounted in the center to provide a quarter wavelength from the base of the antenna. The screen extends up the side of the fuselage. A mounting bracket is used to raise the antenna to allow connecting the coax cable and to provide clearance for the rudder cables to run below the ground plane and the antenna base. The ground plane and rudder cables are grounded to the aircraft system ground. Do not depend on the coax cable to provide system ground. My antenna extends about two inches above the fuselage due to the height of the mounting bracket required to clear the rudder cables and the need to provide quarter wavelength from the aileron torque tubes and other metal parts.

THE SECOND COM. ANTENNA is exactly as described in chapter eleven, page three of the plans. This is RST foil type antenna mounted on the seat back bulkhead. I suggest this antenna be mounted on the passenger side of the bulkhead. I use this antenna for my handheld NAV/COM. The coax cable from this antenna terminates in a panel mounted BNC connector located on the left-forward bulkhead within in reach of the pilot while in flight. A second BNC connector is located in the same area and is connected to a NAV antenna described below. A short coax cable is coax cable is connected to the handheld NAV/COM and to the selected NAV or COM antenna.

NAVIGATION ANTENNA'S;

THE PRIMARY NAV ANTENNA is installed as shown in chapter five, page three of the plans. A modified bazooka balun is used to connect the antenna to the primary NAV/COM receiver.

THE SECOND NAV ANTENNA is a foil type mounted inside the wing hat section of the fuselage. The hat section is removable on my plane. Again a modified bazooka balun is used and the coax cable terminates on the forward bulkhead as described in my drawings.

MARKER BEACON ANTENNA. This antenna is made of half inch copper tape attached the aft side of the seat back bulkhead. This is typical sled type and works fine. If anyone needs more information on this one, please let me know.

TRANSPONDER ANTENNA. The TERRA transponder

and altitude encoder are installed in my plane. The antenna is located between the canard drag bulkhead and the fuel tank on the floor of the aircraft. The ground plane consists of a ten inch by ten inch sheet of .016 aluminum. The antenna is installed on and in the center of the aluminum sheet. Two sides of the ground plane are bent to form a "U" shape to fit against the fuel tank, floor of the plane and the canard drag bulkhead. Pop rivet to the FLOOR only. The antenna extends through a hole on the floor of the plane. I used micro to seal around the antenna. This ground plane must be connected to the aircraft system ground. My transponder and encoder operate very well.

LORAN ANTENNA. This antenna consists of a length of #22 copper wire (bare) extending from the front of the canopy to the rear canopy bulkhead. This wire is inside and is held in place on the canopy with half inch clear Scotch tape the full length of the antenna. It even looks good. I use the VOYAGER handheld Loran with excellent results. The VOYAGER does not require an external preamp, therefore I simply clip the canopy antenna to the Loran antenna. If you use a VOYAGER it must be grounded to the plane ground. I experimented with Loran antenna locations. The canopy location was Jerry Scott's idea and exceeded in performance anything I came up with.

Generally speaking I have had very good performance from my antennas.

Troy Burris

2812 Silverwood Drive

Los Alamitos, CA 90720

There is a lot of people having very good luck with the "hidden antenna's" that are not composite aircraft. The RV family of aircraft are using these antenna's installed out in their composite wing tips. The Falco and GP-4 people all use hidden antenna's in their construction.

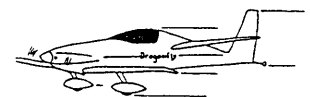
RST - Radio Systems Technology Inc. offers a thirty six page booklet called "Antenna Reference Text" which is a collection of the articles that Jim Weir has written over the past 10 years concerning homebrew antennas for composite airplane for only five dollars. They have hidden antenna kits ranging from ten to thirty five dollars depending on application. You can contact them at;

Radio Systems Technology Inc.

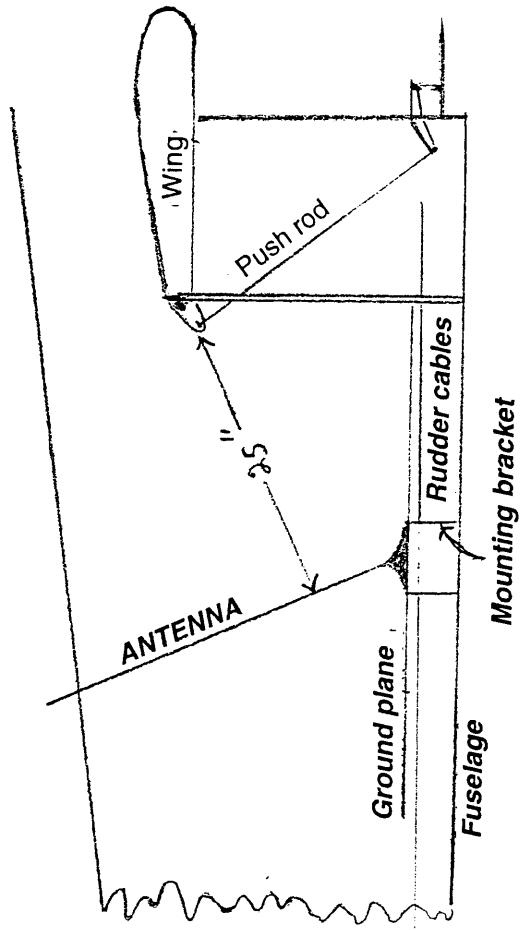
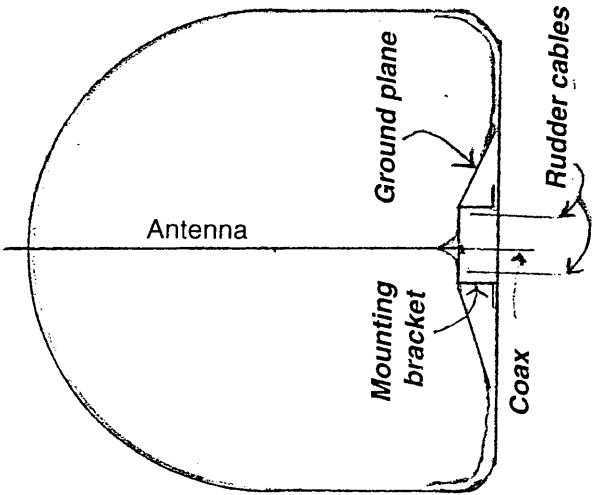
12493 Loma Rica Drive.

Grass Valley, CA 95945

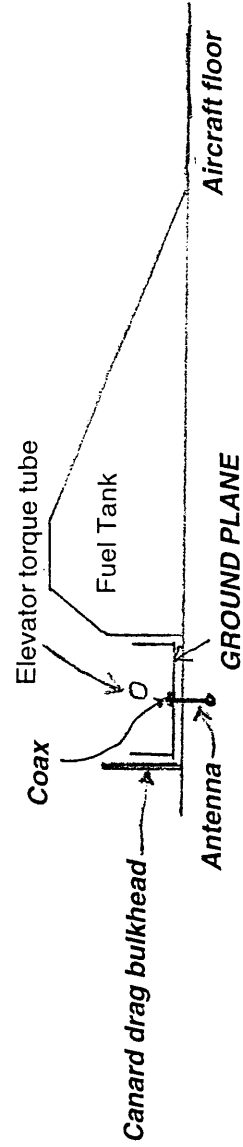
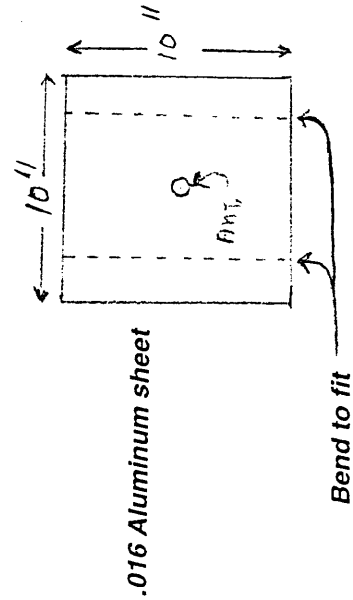
1-800-824-5978



NOT TO SCALE



PRIMARY COM. ANTENNA AND GROUND PLANE



MAKING YOUR DRAGONFLY MORE DEPENDABLE

We don't see that many Dragonfly's being flown to Sun N'Fun, Oshkosh, etc.. When I talk to the owner/pilots who do attend and the ones that do not attend these events, I get all sorts of different reasons. Some people have justifiable concerns about the traffic and what one person describe Oshkosh as "semi-controlled Chaos!" They say that's why they like and do attend our Tandem wing fly-in in Ottawa, KS. At these same big events, we see inside our own aircraft family (tandem wing) quite a few of Q-2/Q-200's that do attend, Yes there is more of them, but of those planes, eighty percent or more are Q-200's. These aircraft have Continental O-200's, a certified engine. Are these aircraft owners more comfortable with these plane, YES! Let's look and see if we can find some of the reason why? And if we can apply some of this **Magic** to our planes.

When one reviews all of their valid & invalid reasons one sense's that the majority of the Dragonfly pilots are concerned of getting stranded or having some type of unforeseeable problem (mostly mechanical).

I went back thru the last 22 issues of DBFN and came up with this summary of accidents or incidents;

DBFN LIST

Zahn	Fuel system -Carb ice
Ufkes	Electrical - Fuse/breaker
Miller	Fuel system - Carb problem
Meador	Fuel system - Fuel filter blockage
Kinros	Fuel system - Fuel filter blockage
Morton	Fuel system - Carb problem
Mace	Fuel system - Fuel pump
Dyson	Fuel system - Fuel loss/strainer drain
Givens	Electrical - Master switch failure
Besse	Fuel system - Fuel system blockage

Also we have a listing of NTSB statistics compiled from 1983 thru 1989 (I will work on getting a fresher update). Bob Woods of Creve Coeur, MO. compiled this summary from all the NTSB accident data sheets on our homebuilt, tandem wing type aircraft. Bobs comments are below;

Hi Spud I have gone through the NTSB accident reports and summarized the data for the Dragonfly as well as the similar Quickie series and compared them to the total for all homebuilt designs. The data shows each failure mode as a percentage of total accidents. The main problems that seems to stand out for the Dragonfly are the high percentage of accidents during the initial test flights (more on this later), and the large number of fuel system, landing, and wind related accidents. This seems to emphasize the importance of having the fuel tank, filters and lines clean

and correctly vented and to also avoid cross winds during the early flights. (**Summary is on page 7**)

Bob Woods

I would like to preface one thing on Bob's summary. Bob sent me all the data that this summary came from. On the summary, the section under Pilot Errors - Landing, you'll see a high number 31.3 %. A good portion of these were Mark I landing accidents (busted canard, pilot induced) and a few Mark II gear collapses.

As you can see by looking, the problem sure isn't the airframe (flying surfaces, fuselage, etc), it looks likes mostly pilot error or items related to mechanical operations.

AIRFRAME

Let's look at the airframe now even though it's not the cause of any major accidents it is involved with some minor incidents and there is a few areas that cause some builder/owners some concerns. We'll address what improvements we could do to make us more comfortable with it.

1. Landing gear; We have several options in this area, current DF construction is in;

A.The Viking Mark II style,

B. Fuselage mounted hoop style,

C. Tri-gear.

A.The fiberglass Mark II gear legs seem to live just fine once they have been reinforced in the transition area above the tire with eight to ten plies of ten oz. The steel gear has proved to be stronger in all area's and just slightly heavier. Some people feel that the steel gear leg would be considerably heavier than the fiberglass. I would guess no more than ten lbs. heavier at the most. Look at Steve Larabee's, it has steel gear legs and weighs in at 671 lbs. This is excellent for the equipment list he has in the aircraft.

B.The bow style gear has given us another improvement, only observation so far is it might be a good idea to put two plies of ten oz. Bidirectional laid up forty five degrees to vertical of the leg itself to make sure it is stiff enough. Some of the early comments are that some people may have built their hoop gear leg a little on the thin side down where the axle attaches. The problem that arise is a toe-in & out flexing problems during initial landing contact as the weight of the aircraft loads (compresses) the gear.

C.The tri-gear; I have very little input on the tri-gear because it is new, but reports from Dave Bastion and Phillipe Soulas is that it makes the Dragonfly a "Pussycat" in landing and take off mode.

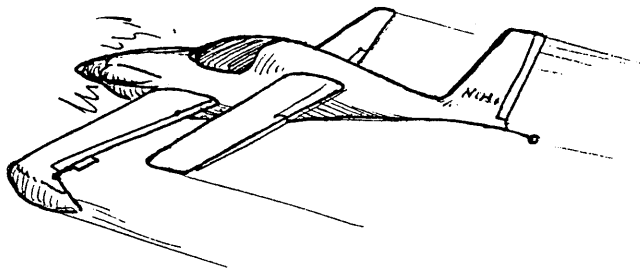


Another airframe problem is the rain/bug sensitivity of the GU (Glasgow University) airfoil. A general overview/synopsis is **YES**, there is a degradation to this airfoil when in a rain or bugged up situation. An estimate of this degradation is up to twenty percent. So what happens when we are in this condition we are effectively reducing our 102 sq. ft. of wing to as low as 81.6 sq. ft.. We have found out that this degradation is aggravated by builders building inaccuracies. These are not keeping the airfoil contour when weave filling with the big one being the inaccuracies in setting of the angle of incidence or decalage. Decalage being the differentials of the angle of incidence between the canard & the wing. We have had some people really get this way out, two to three degrees! If these are all in proper alignment the sensitivity/reaction will be minimal. Even with these builder inaccuracies we have learned a couple of ways to reduce or eliminate these problem with Vortex generators and/or gap seals.

ENGINE/PROP.

There is several phobias in this area. The big one is crankshaft breakage. As people wanted more and more horsepower the engines got bigger & bigger. The compression ratio's grew also as the engine manufactures searched out more horsepower/torque. They have attempted to combat the higher loads/harmonics on the prop-bearing areas with reinforced add-on bearing/prop hub supports. When Rex Taylor had developed the eighty two horsepower Super Magnum engine which had the best of everything and he had the engine size at it's maximum size, had the compression ratio at the highest ever, then that's when there was two crankshaft failures. There was a recall on these engines by Hapi. Well, this spooked everybody in sport aviation and they are still very spooked about this to this very day. The problem was with these "MAXED OUT" engines only, the potential VW user has not taken the time to properly research the whole story. And that's why you are seeing so many people seeking out alternative engine combinations. Which is very premature.

One of the main reasons that pushed



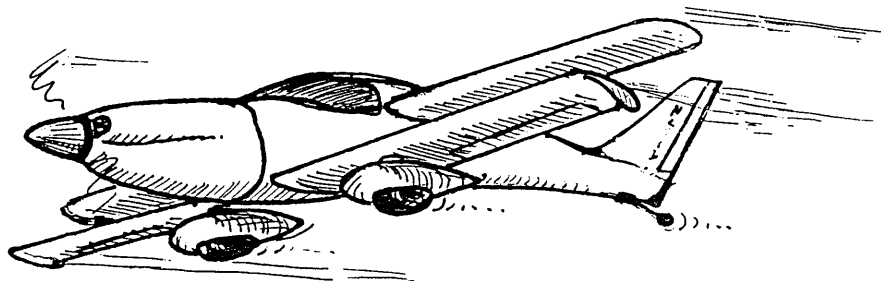
BOB WOOD'S NTSB SUMMARY

ACCIDENT DATA 1983 - 1989

	DRAGON-FLY	QUICKY	Q-2	Q-200	ALL HOME BUILTS
TOTAL ACCIDENTS REPORTED	16	19	52	6	789
FIRST OR TEST FLT - PERCENT	50	36.8	19.2	50	13.6
FATAL - PERCENT	12.5	5.3	7.7	33.3	30.7

MECHANICAL FAILURES -	PERCENT OF TOTAL ACCIDENTS				
FUEL SYSTEM	18.8	0	7.7	16.7	8.5
ENGINE CONTROL	6.3	0	3.8	16.7	2.5
ENGINE MECHANICAL	6.3	21	7.7	0	8.4
PWR LOSS IN ACROBATICS	0	0	0	0	0.6
UNKNOWN OR MISC PWR LOSS	0	10.5	5.8	0	7.6
STRUCTURAL FAILURE	6.3	0	3.8	0	4.9
SYSTEM OR OTHER FAILURE	6.3	10.5	9.6	16.7	7.7
TOTAL MECHANICAL	43.8	42.1	38.5	50	40.3

PILOT ERRORS -	PERCENT OF TOTAL ACCIDENTS				
LANDING	31.3	10.5	32.7	33.3	14.6
TAKE-OFF	12.5	10.5	15.4	16.7	8.2
FUEL EXHAUSTION	0	10.5	5.8	0	4.8
WIND	12.5	5.3	1.9	0	3.9
GROUND	0	5.3	0	0	2.2
ACROBATICS	0	0	0	0	5.6
GENERAL	0	0	5.8	0	15.1
UNKNOWN LOSS OF CONTROL	0	15.8	0	0	5.3
TOTAL PILOT ERROR	56.3	57.9	61.5	50	59.7



these Super Magnum engines to failure was the higher compression ratios. This is why Steve Bennett of Great Plains Aircraft is having such good luck with his engines. He uses a Force One hub and hold his compression ratios to a maximum of eight to one. And his engines live!

Another problem of the VW is case crackage. The stock VW case is a magnesium-alloy mix. It work hardens progressively with heat and age (read that as lots of miles!). Quite a few people build up engines using a used case, they don't know if it's got 10,000 miles or 100,000 miles, then when it does crack, then they wonder why that happened. One of the assets of the Type IV cases is that it is aluminum, not magnesium and will not work harden. Your best bet is to use at least a "new" Type I stock case with some light re-enforcement behind number three cylinder or even better yet buy one of the the new "AS21" all aluminum Type I cases which are available from Great Plains Aircraft.

The next areas which is responsible for quite a few of the forced landing are:

1. Ignition - electrical system
2. Fuel

IGNITION - ELECTRONIC Let's look at Ignitions first. Over the last four years several Dragonfly builders have learned the hard way that the dual electronic ignition system did not do a bit of good when the weakest link in the electrical system failed and shut down both ignition systems. For the person who wants to do some serious cross-country flying or at least improve their comfort level. One of two things need to happen.

1. Install two completely isolated electrical - Ignition systems. Two batteries, two ignitions, etc.

OR

2. Run with one electronic Ignition system and one magneto (this is fast becoming my preference!). Not to be repetitious about Great Plains, but their standard system has always been the primary ignition is the magneto and the electronic is actually the SECONDARY system.

When Rex Taylor designed his dual electronic ignition system, Surefire II he set it up so when it was wired up correctly was designed for one ignition to run off the alternator side and the other of the battery side. The idea was to be able to isolate system so if the battery died or shorted you could shut down that side of the system and you would be running of the alternator. Or visa versa if the opposite happened. In Ted Givens situation, he had only a single ground wire, this failed thus shutting down BOTH ignitions.

FUEL SYSTEM

According to the DBFN list it is 80% of the problem and 18.8% of the overall accidents/incidents from the NTSB listing.

Basically when the engine quits receiving fuel in one way or

another, funny thing it quits running! There's two way we can cause this problem!.

1. Exhaust the on board supply of fuel, or
2. Mechanically we are unable to get the fuel into the combustion chamber of the engine.

Fuel problem category #1. Running out of fuel (This doesn't show up on the NTSB summary, but we have had a couple (trust me on this one)). Well let's see.....Hmmm.....Well, I can't seem to come up with a answer for this one. This illness is plaguing **all** homebuilt and certified types. I can only suggest if someone thinks he or she might be coming down with this illness, I can only suggest that they check with their family doctor to see if they have a treatment for "CRANAL-RECTAL INVERSION!!" (read that as "head up their butts!") Excuse me for being so coarse, but there is just no excuse for this to ever, ever happen.

Fuel problems category #2. Let's break it down a little further.

- A. Fuel filter blockage
- B. Fuel pump failure, electrical or mechanical
- C. Electrical system failure thus shutting down electrical fuel pump.

A. Fuel filter blockage. Because of the nature of the materials that we construct composite aircraft out of we need to be incredibly cautious here. We have talked about this before and we will again here. I know quite a few of you go thru great pains to clean your tanks before closure, but it can not stop there. After the tank has been closed up and the plane is close to completion (sanding completed and painted) we can start by filling the tank with aviation fuel multiple times and to different levels and set up a temporary fuel pump and larger canister fuel filter and cycle this fuel for hours and hours. During this process pickup the ass end of the plane, shake the hell out of it, nose up, nose down, go thru all sorts of maneuvers, lift the wings, etc.,etc.. Then as we start our taxi test program we introduce a whole new vibration to the airframe. Go thru you taxi test program and then change the filters **BEFORE YOU FLY!** Start developing a pre-test flight check list and make the changing of the filters part of that check list. Also change the filters some where between four to ten hours into the test flight program. Think as this as insurance. I can hear some of you right now....."Gee, I'm going to spend twenty to thirty dollars of fuel filters". Ask yourself if the people that have crashed because of fuel filter blockage that have severely damaged or destroyed their airplanes and spent three weeks in the hospital if it would of been worth twenty or thirty dollars! And while we are on the topic of fuel filters, don't use these little see-thru glass filters that I have seen around, at least not during taxi testing phase or the first forty hours. These filters just don't have enough surface area. I suggest that you use a "pleated element - canister" type fuel filter.

We had a strong comment at last years fly-in favoring the

little see-thru fuel filters. The comment was that you could see the fuel filter beginning to become clogged up. This gentleman was planning to put it in a location in the aircraft where he could watch it while he was flying. No! We got better thing to do than watching the fuel filter, especially during the test flight stage. I suggest the best thing for you to do is fly the airplane and navigate. And if you are flying along, the engine quits, and you look down and your filters clogged. Then what the hell are you going to do! Change it! Wrong! I guess it would be handy to know so you could let air traffic control know why your going down. It would sorta go like this "Mayday! Mayday! Mayday! Kansas Center! Experimental N1371DF declaring an emergency! I'll be making a forced landing ten miles south of whatever! I just want to let you know it's because I have one those damm little clear see-thru fuel filter that just got clogged! I just wanted to let you know before I do this forced landing thing".

B. Fuel pump failure; I'm seeing more and more redundancy in this area in all aircraft types. Some people have had mechanical fuel pump mounting pad welded to the side of the case so they can mount a mechanical fuel pump sideways on a VW engine case (the original VW fuel pump sits on top of the case in the stock location, this would not work with a Dragonfly cowling. It is already mounted on the side of the TYPE IV cases.). This works great when coupled together with at least one magneto. If you have a complete electrical failure you are still in business.

Some people are doubling up. That is they are mounting two electric fuel pump for redundancy. Running two lines, two electric fuel pumps to the header tank and two more electrical fuel pumps from the header tank to the engine incorporating one way check valve prior to the carb to eliminate back flow. We will expand on other possibilities in future issues of DBFN.

One could also set up a mechanical fuel pump like Kimbull McAndrew showed us back in DBFN issue #53. I also noticed in one of the EAA Technical Counselor issues that someone did approx. the same thing, but had the fuel pump up by the firewall and had it attached by pushrod to a lever back up by the dash. He also took advantage to change the leverage arm to make it effortless to pump.

C. Electrical system failure; This creates two problems, when we loose the electrical system we shut down the fuel pump, but we also shut down all ignition systems (this is why I like one magneto & one mechanical fuel pump). We have several people working on designing two completely independent electrical system. What I mean by that is, Two batteries, two ignitions, etc.. two completely independent circuits. The way to setup this system is to have a primary system which would have a good size battery for cranking/ start-up power. The secondary electrical system would incorporate a lighter gell cell type battery that would be dedicated to running three items ignition system, fuel system, nav/com system. the secondary system would have to be able to be isolated from the failing primary system or visa versa. As you can see that creating a true electrical

back up system can start to become complex and start to gain some weight. I am concerned about a ten to twelve pound weight gain, but if I can get a true dependability increase. Again the magneto just might be the simplest and lightest alternative for this problem.

Let's know review what makes us so comfortable with certificated aircraft engine, like a Continental O-200 and what can be applied to the VW/Dragonfly;

1. Two completely isolated ignition systems - 2 magnetos, 2 spark plug wire harnesses, 2 full sets of spark plugs. What would happen to this engine if it had dual electronic ignition and had a failure like Ted Givens did, down it would come also!!!!

2. Fuel pump failure or fuel blockage. Down it would come also!!!

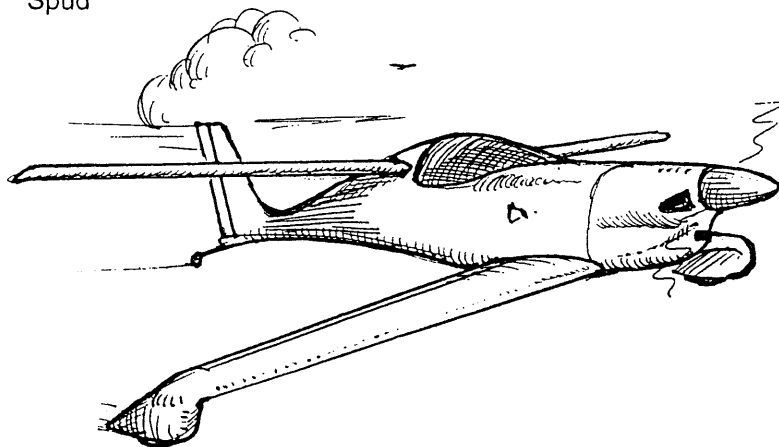
When looking at all of these FACTS and NUMBERS, the one that should hit everyone "right between the eyes" is back on the NTSB summary under DRAGONFLY, the second line. **FIRST OR TEST FLIGHT - PERCENT (this means first 40 hours). IT SAYS 50%.....Hello, it says 50% ! 50% of the time something will go wrong during the first flight or somewhere along the way of the first 40 hours.** Let's put this in a different perspective. If you drove to work successfully, you would surely crash on the way home. If you made it up a set of steps, then statistically you would fall coming down. If you made one successfully take off and landing you would surely have a accident on the next one. We are taking thing way to much for granted during our test staging of our aircraft. With these type of stats, we should not be thinking if or maybe, more appropriately we should be thinking **WHEN!!!!!!!!!!**

Well people, you can to build a dependable cross-country Dragonfly, it just takes a little planning, before you build, as you build, after the plane is completed and **before every flight!** If you'll look back at Bob Wood's summary 56.3% of the problem is pilot error! So we can improve two ways;

1. The mechanical part, the airplane
2. Your head (substance lodge between your ears)

Very Best Regards

Spud



EDITORS CORNER

● I need Dragonfly video's!

I need video's! I would like to start collecting everyone's video's that pertain to the Dragonfly, fly-in's, construction, etc.. I'll be glad to pay any nominal fees, postage, etc.

● Fourth Annual Tandem Wing Fly-in !

Well here it comes! Our fourth annual tandem wing fly-in. I can't believe this is the fourth one. Everything is set. The registrations are coming nicely, but by the time you receive this newsletter it will be time for you to make that decision whether you are coming or not. Please don't drag your feet, we need those registration and funds here as soon as you can. We really need for you to put for the effort to get that in ASAP! I'm sorry to say that we had to turn away several people for the awards banquet last year. We stretched as far as they would allow us and we still couldn't get everybody in. I really felt terrible! So PLEASE make the commitment to attend! Get those registrations in right away!

● DAVID vs GOLIATH

The Dragonfly vs The RV-6 article has really created quite a (what's the word, let's say) "Response"! The calls and the letters have been "**mild to wild**" with approval of the article (I think I hit a nerve)! And I think that's just fantastic! It's very rewarding when one get that kind of approval from his peers. **Thanks a million!** My favorite response came by phone from Rob Kermanj of Boca Raton, Florida. Rob owned a Dragonfly Mark I that he built and then flew for seven years, putting on over 975+ hours before he sold it last fall. Now Rob wasn't displeased with his Dragonfly at all, he just had "The Itch" to build something else and that something else just happened to be a RV-6. He's completed the airplane and has 50 hours on it. Spud your article, David vs Goliath is 100% correct except in one area and we'll come back to that in a minute. First off, Spud we can find no fault with the RV-6 it is truly a remarkable airplane. We don't know where it couldn't go! We have a trip that we make all the time, Boca Raton to Gainesville. In the Dragonfly we would burn nine gallons, in the RV-6 we burn right at twenty gallons. My wife and I were very shocked at this aspect of the plane. We will be flying the RV-6 to the Swarming this year. I hope we are welcome (absolutely YES!) I will always feel as part of the Dragonfly group! I said your article was correct except for one area. And that is your cost estimate to build the RV-6. It's way to low!!!! I could only hope that it would be that cheap! My wife and I refer to it as the "**MONEY PIT**" It's substantially higher! We are just **now** really appreciating some of the assets of the Dragonfly! - Rob Kermanj

● Newsletter copying !

I guess I made the mistake 4 years ago of making the comment at Oshkosh that I didn't care if someone wanted to copy someone else's newsletter to save a few bucks, I would like to retract that statement!

I just got off the phone with a Dragonfly builder out of Arizona area that has been rebuilding a canard for his plane. This gentleman has called me four times over the last year or so and I have spent close to three hours on the phone helping him figure what was the best way to do this or that. I love to help, I love to talk shop! I spend an average of 3 to 4 hours a week (My wife thinks I'm loony!). Every time this gentleman called (I'm pretty good on remembering names) I asked him if he was a subscriber, his answer was that he was just sending in his payment for the newsletter. Well, he said this on all four occasions that he called. (Please don't insult my intelligence) This last time I said, NO! Stop! Whoa! I told him I would be glad to help him as soon as he subscribed. Well was he ticked, definitely put out! He finally admitted that he had no intentions in subscribing, he just copies one of the "other builders" newsletters. I asked him, if it cost a \$1.00 to \$1.20 to get a quality copy and if he put ANY VALUE what so ever on his time, just how much was he saving. He felt he was still saving about a \$1.00 and had full intention in continuing to copy the borrowed newsletters! But he expected me to help build his canard over the phone.

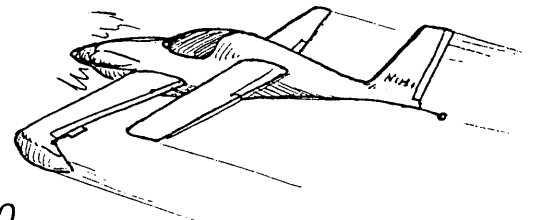
I had Bruce Dixon call to get a phone number for a builder out of California that had read in one of the newsletter about Bruce having peroxide staining problems with the West System. This person wrote to Bruce with several questions. Bruce thought it would be just as quick to call the man back than write. The guy was on the Viking roster, but had never subscribed to the newsletter. This guy has an almost completed a Dragonfly that he has built without a newsletter, Wrong! He get's copies from some where, he read about Bruce's problem with the West system.

There is another area of the country were one person takes the newsletter and then copies it for six other people. Give me a break!

I would be remiss if I did not mention the 80 to 100 people that have sent letters full of "Attaboys" about the newsletter and what we have done as a group for the group, I'm truly flattered and I humbly thank you!

The newsletter, the Sun N'Fun and Oshkosh forums & activities, Our annual fly-in in Kansas, the technical support, it's all a lot of damm work! I spend 400+ hours in all these areas and I don't like being taken for granted! If you folks don't think its worth it, just let me know and **I'LL STOP!**

Thank's - Spud



THE CLASSIFIEDS

For Sale: Dragonfly MKII - 130hrs. TT, 75HP Revmaster, Ellison Carb, dual electronic ignition, Terra com, Transponder w/Mode C, Micro engine monitor, Loran, GPS Intercom, ELT, Inboard gear, Rosenhan disc brakes, flies great! Asking \$17,000.00 Call John 801-328-3617

For Sale: Have a canard assembly (has been flown) complete with balanced long elevator system. no landing gear (clean canard) which was built by Mike Quigley. Paid \$1400.00 will sell for \$1000.00. Also Viking Mark II gear leg kit, unassembled \$300.00 Contact Gerry-Lynn (405)237-8968

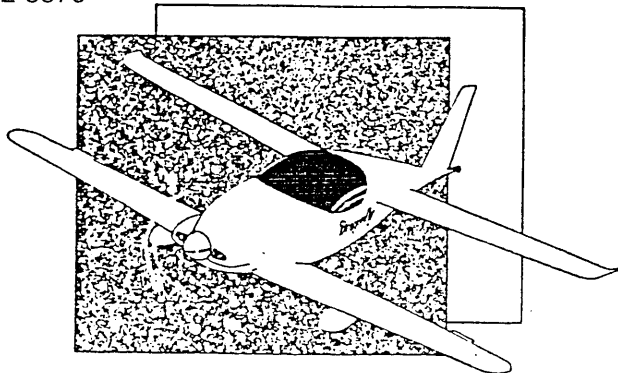
For Sale: Sterba 60X68 prop \$250.00, spin-on oil filter adapter for continental \$125.00, Day (508)668-4784, Eve(508)668-5285 EST

For Sale: INSTRUMENT PANEL LAYOUT STICKERS- Trying to lay out your instrument panel and you've forgotten which circle is which? Here's what you need!! A packet of 10 pages of full size photo-repro's of instruments, gauges, switches, etc. Just peel them off and stick them to a mockup of the panel or on the instrument panel itself. A good way to fly the instruments before the plane is finished. Send \$20.00+\$2.50 S/H to Houde Enterprises, 12573 U.S. HWY 26, Riverton, WY 82501

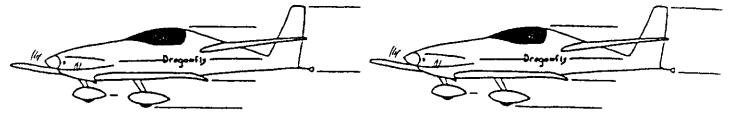
Wanted: A ride in a Dragonfly for prospective builder. Close to western New York state. Some time before winter. Al Germann, 12440 Meahl, Akron, NY 14001

For Sale: Dragonfly under conversion to tri-gear. Needs new canard. Hapi 60-2. Basic instrumentation, prefer to sell complete "As parts"; consider parting out. \$6000.00/offers. need the space. John Owen;5173 Driftwood Drive; Davidson, NC 28036

For Sale: Mark I (the one without the stilts) never flown. Hapi conversion. Is complete and has been taxied. Internal stowed BRS ballistic chute. Weight 650 lbs. How safe can you get? Built by A & P. Your best offer will be less than it cost me but I don't mind (603) 482-3876



DRAGONFLY



Subscribers Information Center

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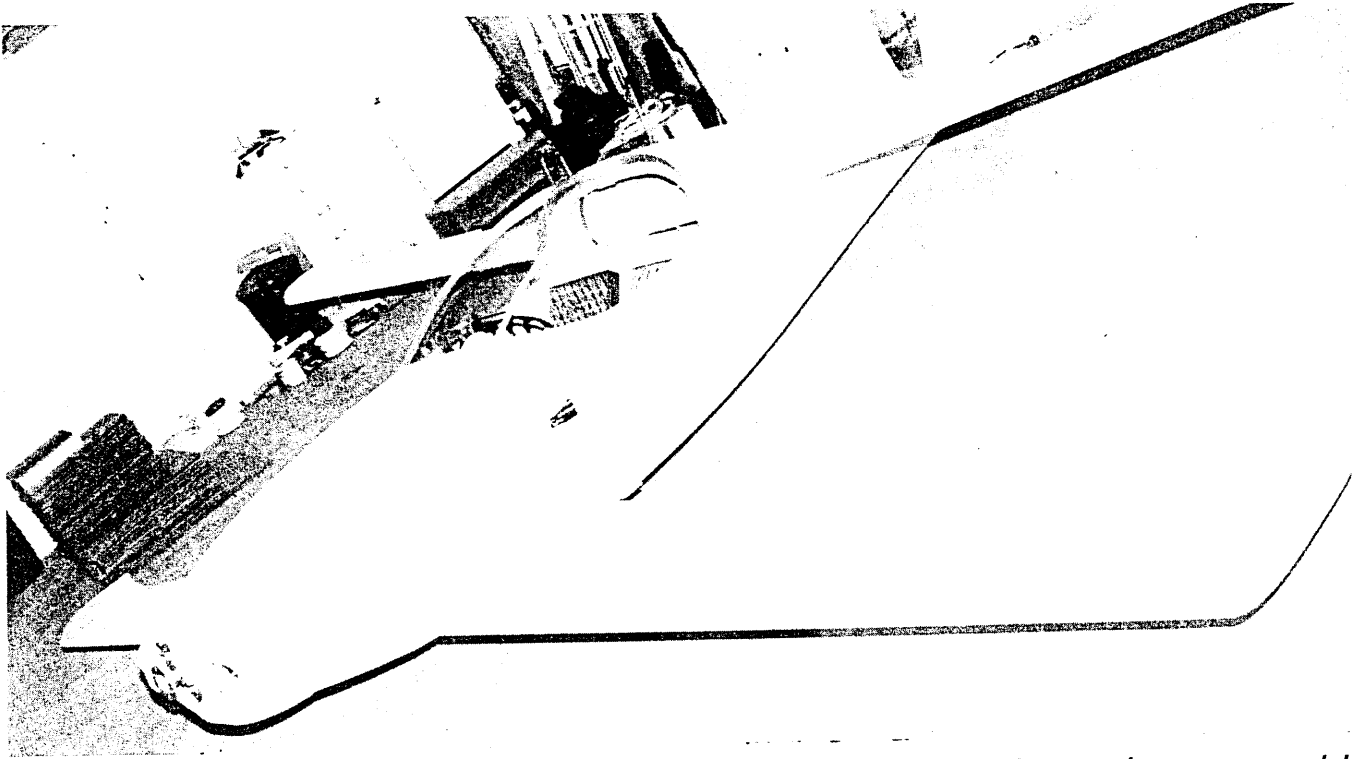
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PHONE (913) 764-5118



*Buck and Jo Buchanan of Groveland, CA. have figured a solution to the gear problem!
They have designed these very small, light weight, thruster motors that they embedded
into the bottom of the wings thus eliminating the need for main gear!*

Did ya buy that! If so, I have a bridge.....



**1112 LAYTON DRIVE
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FIRST CLASS MAIL

Last issue before the

**Fourth Annual Dragonfly/Q-2/Q-200 Fly-in - Sept. 2,3,4 1994 Labor Day weekend
Registration form enclosed - Please fill out and mail immediately!!!**

