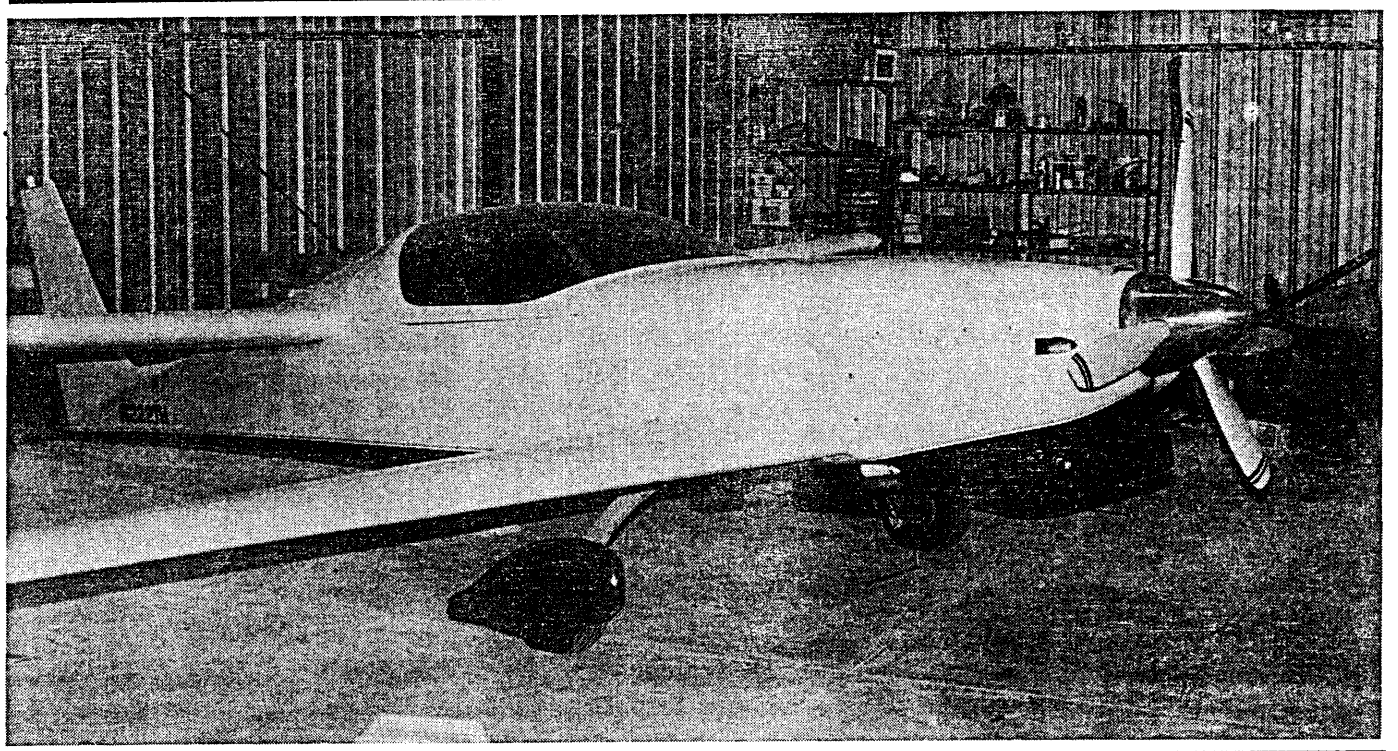
DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

THE OFFICAL VOICE OF DRAGONFLYERS ALL OVER THE WORLD

VOLUME 63 JANUARY - FEBRUARY 1996



DR. RICH GOLDMAN OF NORTHBROOK, ILLINOIS MAKES HIS FIRST FLIGHT IN HIS NORTON ROTARY POWERED MARK II DRAGONFLY

OK gang, your in for a treat! Doc Goldman has flown his Dragonfly and as he had promised, when he flew he then would report on his 14 year Odyssey. Rich....you are a remarkable gentleman and my hats off to you. Super Congrats!!!!! - Spud

Spud, it is either feast of famine. Below is a little of the feast. Feel free to use as much or as little as you wish, in any order or any issues you wish. Further data will follow as it becomes available. You are doing a terrific job. The news letter is practically the only piece of mail that I receive that I read from cover to cover before putting it down. Most of the rest hit the file cabinet first. Thank you for your efforts on behalf of all of us. I am especially happy to hear that your son is recovering well.

Yes, after all these years of promises and threats that my Dragonfly would indeed fly, the wheels actually did lift off of the ground without the help of a winch or a tow shortly before the Oshkosh EAA Air show. Below are the stats of my 14 ½ year building experience.

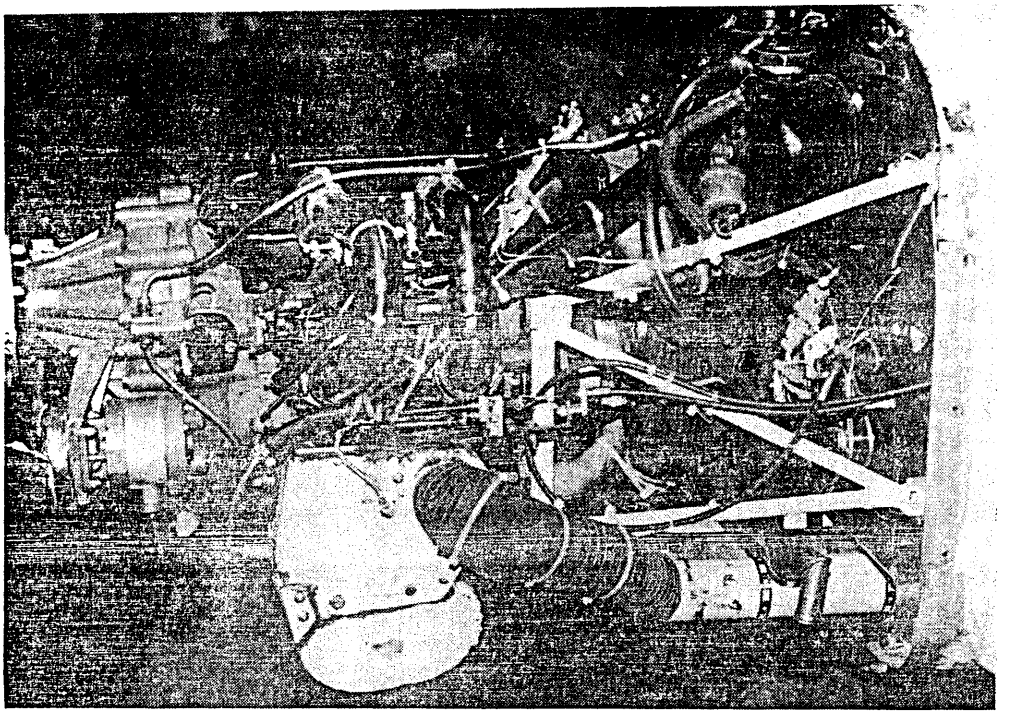
Basic Dragonfly Mark II with a few exceptions as listed below:
Aileron servos
Electric two position belly board speed brake
Electric roll and pitch trim
Hoop style landing gear with Cleveland 5"wheels and brakes
Wehelen strobes and nav lights
Duplicated fuel pumps
Large forward hatch (a must!)
Hinged "hat section"
Electric cowl flap pre select and infinitely variable setting

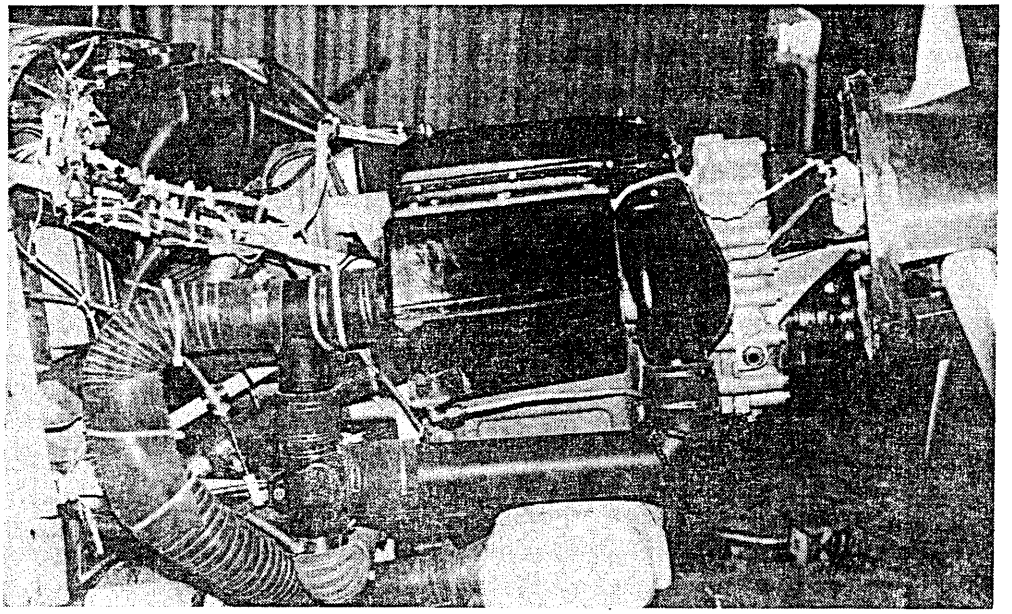
Avionics and instrumentation:
Terra TX760D Com
Terra TX200D Nav
Terra TRI-NAV-C CDI
Terra TRT250D Xpdr
II Morrow 618 Loran
Lap Map GPS Moving map
Insite Strikefinder
Rocky Mountain Instr. MicroMonitor
Rocky Mountain Instr. MicroEncoder
Vacuum driven AH
Vacuum driven DG
Vertical card magnetic compass
Navaid Devices autopilot including altitude hold and VOR LORAN & GS coupling
Co-Pilot altimeter and airspeed indicator
Flightcom intercom with recorder
RST marker beacon
Capacitive fuel quantity gauge

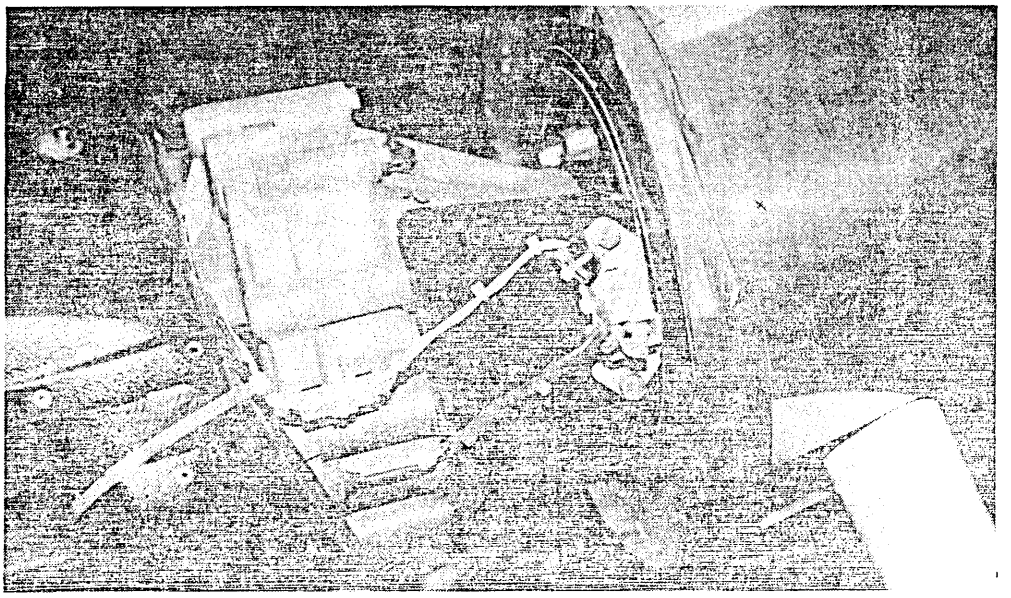
(As I was building the airplane, the going joke around the airport was that I may never fly it, but at least I will always know where I am)

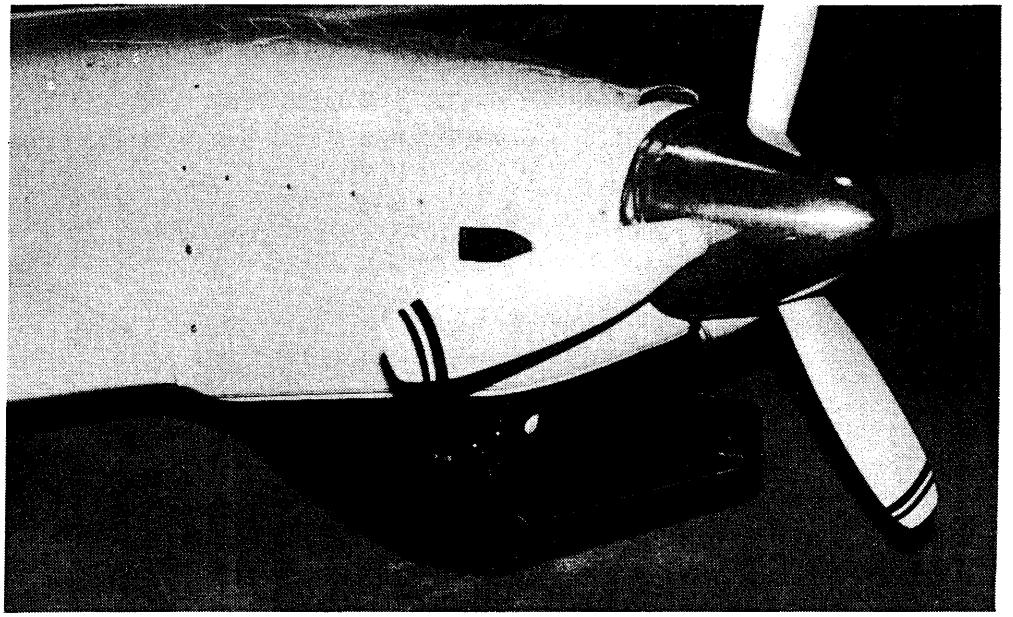
ENGINE:
The engine is a Midwest Engine two rotor Wankel *ROTARY* engine. It was made in England and is a derivative of the NORTON rotary motorcycle engine. It is converted or built up from the motorcycle power head by Midwest as an aircraft engine. As a matter of fact, this engine has just undergone certification testing in England and rumor has it that it will be the standard engine on the Diamond Katana. Currently it is fed by two Tillotoson carburetors. These will be replaced by an electronic fuel injection system in the near future.

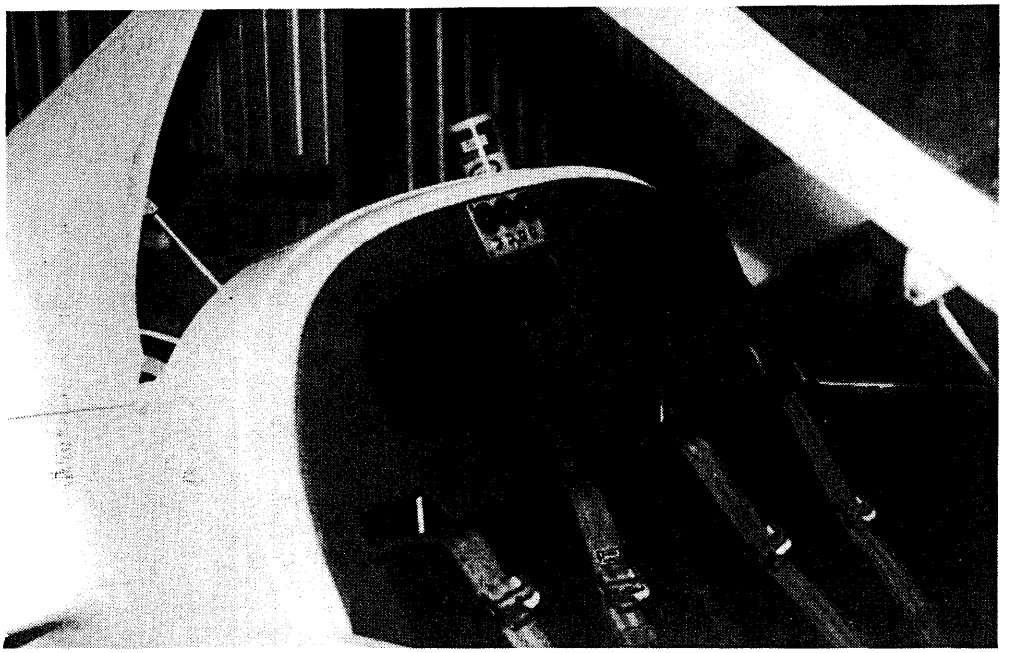
PROPELLER:
The propeller is a three blade, wood,

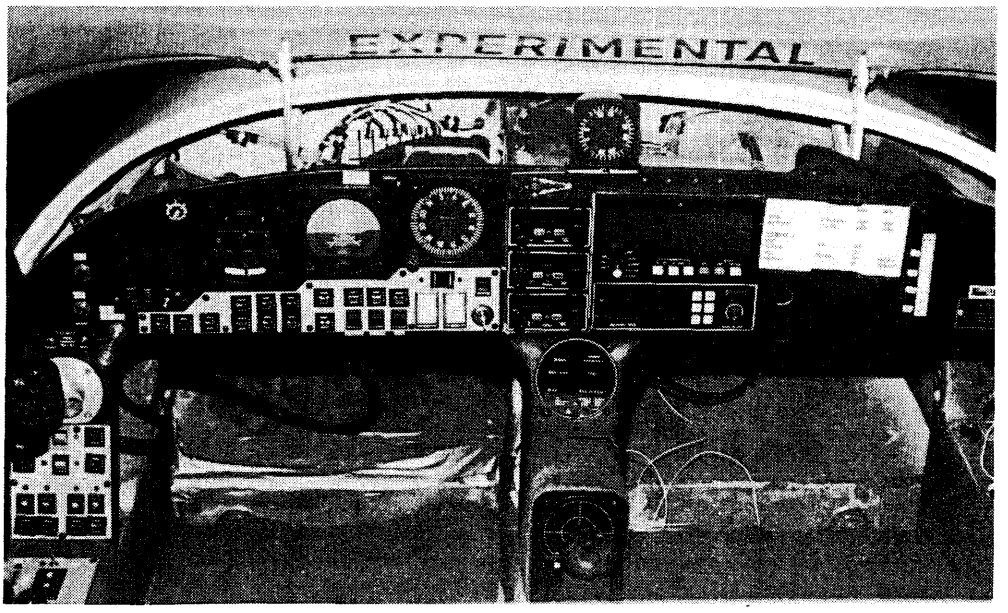












electrically cockpit controllable 52" prop made by Aeromaster Propellers of New Zealand.

As you may know, the first successful flight, as a Mark I-- although not the first successful landing --took place on Father's day 1991. This was witnessed by my wife Linda, Son, Daughter and one of their friends as well as several airport locals. It was done in the late afternoon because of various "finishing touches" that I had to do before the flight. After the arrival and courteous FAA ceremonial formalities, we carefully carried my wounded insect back to the hive for a new canard and some minor reworking. This 'minor reworking' (spelled MAJOR) occupied the next four years. After measuring the angles of incidences of the wings and canard with jigs that I fabricated, I discovered that my relative angle of canard to wing was three degrees canard nose down. The wing to fuselage angle was perfect (measurements were taken with an electronic digital "smart level") This angular difference was in spite of the fact that in the original assembly, I took great pains to get these angles dead nuts (or bolts) on! This, despite proper W&B led to apparently nose heavy flying condition in which high IAS was necessary during landing to keep the canard flying until contact with the ground. From what I understand this is not an uncommon occurence. The high landing speed, combined with the Mark I's tenancy to bounce, and probably to a minor extent, (spelled MAJOR) my lack of experience in the airplane, (I had flown in several but had never made a landing, or even an approach to a landing--thinking that my over 2,000 hours of PIC would hold me in good stead), as well as the pressure to fly the aircraft because of the entourage that had come to witness the 'first flight', all contributed to the--shall we say less than perfect ending to the flight.

After measuring the angle of the water line of the canard with respect to that of the wing on several other aircraft, and relating this angle (which should be 0) with respect to geographical areas, It seemed that the angle difference was greater in those areas that experienced

cold weather. I believe that the problem that caused this finding is the fact that when you heat air and don't humidify it, (as in a basement work shop in the winter) it becomes dry and the wood table, on which we build and level the wing and canard, has the opportunity to warp. The plans call for bondoing the level board on the wings, which are attached to the table, with respect to level. If you haven't measured the level line of the flying surface just before affixing the level board, there is a good chance that the board angle will be wrong despite the accuracy of any subsequent or preceding measurements. This phenomenon would of course become increasingly more possible the longer the wing is under construction

Now for the *SECOND* first flight.

After the FAA recertification I decided to go about the first flight more logically. Firstly, and definitely recommended (spelled ***MANDATORY***) is a thorough checkout in a Dragonfly. As is so often stated in this newsletter, the Dragonfly is not a difficult airplane to fly and land, it is just *different*. In fact it is a sweet flying aircraft and seems to land well if flown like a Dragonfly. Try to land it like a butterfly and it will try to bite you. After my pride and joy came out of its chrysalis for the second time sprouting its new canard, radios, engine, prop, vacuum system, aileron servos, belly board etc, I visited Steve Laribee for a check out. Because time was short, against his suggestion, I elected to forgo air work and just work on landings (and takeoffs). In this brief time, I learned that the Dragonfly can withstand some less than perfect landings. The most obvious difference between the Dragonfly and a standard airplane is the increased sensitivity of the elevators. Because the aircraft must be "flown on to the ground" minor stick movements cause what seem, at first to be major oscillations. First time landers, especially when close to the ground, will get into PIOs. Unfortunately, the last landing I did with Steve resulted in the automatic shortening of his propeller. (Sorry Steve)....Never ending thanks for your patience and guidance. I will never forget the two of us dragging your Dragonfly back to the hangar by the now modified prop.

One of the biggest problems that I had to overcome (having virtually all of my PIC time in tricycle gear) was the unfounded psychological block that the Dragonfly is unstable on the ground at high speeds. The truth is that it is actually controllable, and quite docile when on two wheels barreling down the runway, such as in landing and takeoff rolls. Before becoming confident of this, the time between tailwheel liftoff and rotation and the time between touchdown and tailwheel touchdown seemed to be precarious at best and downright unmanageable at worst. My other concern was the possibility of prop strike as the wing lifts and the airplane rotates around the wheels with the tail up and the tires on the ground. To overcome these mental barriers I set upon a regimen of slowly increasing taxi speeds and not going to next speed until I was totally comfortable with the way the plane felt at the previous speed. To overcome the fear of a prop strike, I measured the deck angle when the prop touched the ground and temporarily installed an inclinometer in the cockpit with markings to indicate when I was close. Since this was a pendulum type device I had to fudge this "red line" since the acceleration of the airplane on the runway would give an erroneous reading, always indicating a lower angle than actual. Logically, the wing cannot continue lifting to drive the propeller into the ground because after it lifts to waterline level, it will go into a negative angle of attack and destroy the lift lowering the rear of the aircraft.. Bouncing on the runway for what ever reason will change this equation (sorry again Steve). When I do my takeoff runs I start with neutral elevator. The plane will tell you when it is time to rotate.

So after I felt comfortable with tail up high speed taxing, and had deeply ingrained in my brain that tiny rudder really has tremendous authority, even before the tail wheel lifts, I checked out my insurance, made amends with all of my enemies, put all of my affairs in order and drove out to the airport alone early in the morning. Unfortunately it was a perfect day--calm CAVU and 70 degrees.

For the twentieth time, I inspected the airplane, and using a three page checklist, and did a pre-flight inspection. Damn--everything checked out. Starting the engine, I contacted the tower and taxied to the active. I had a tape recorder hooked to the intercom on which I recorded not only my conversations with the tower, but at regular intervals I read into it the various engine parameters according to a predetermined agenda, as well as any other pertinent information and observations.

There I was, after my run-up, sitting at the end of the runway, cleared for takeoff, asking myself, **"WHAT THE HELL AM I DOING HERE,"** I didn't remember anybody forcing me to do this! After what seemed like several hours of soul searching (minutes) I advanced the throttle, heard the sewing machine like engine spin up and tried to keep the Dragonfly reasonably in the center of the runway. True to all the fast taxing experiences I had, the tail lifted exactly as before, and the apparently extremely low deck angle did not phase me (much). Continuing to accelerate, I gave the stick slight back pressure and the plane levitated. The D-fly does not climb at a high deck angle, but sort of seems just to rise. Things seemed relatively normal, other than a slight nose heavy tenancy that couldn't be trimmed out (later corrected by reflexing the ailerons), but other than that it was terrific.

Because of the engine installation being a one of a kind I was very concerned with temperatures. True to my worst fears, as I climbed in the pattern, the water temp was climbing past the point that I had projected. Reduction of power had little immediate effect so I stayed in the pattern, came around and attempted my first (hopefully successful landing). My turn to final from base was at a approximately the same place and altitude as I use in other planes.

Airspeed pegged at exactly 85 mph (*give or take 10 mph*)-- I really didn't see the airspeed or at least it didn't totally register in my already overloaded mind, but flew mainly by feel--not necessarily a great idea-- Over the fence at about 75, flair just before you think you will speaking some Asian dialect, and keep the plane at a relatively level attitude, slightly tail low, and let it kiss the earth. **KEEP ON THOSE RUDDER PEDALS.** A taildragger (not only the Dragonfly) wants to switch ends all the time. Fortunately I, in my high speed taxing, got very used to the efficacy (and in some cases over-efficacy) of the rudder, and how to control it, and learned to prevent and overcome over control. With all this in mind, the plane becomes friendly on landing and takeoff. Until you have mastered ruder control and feel--- DON'T FLY!! PRACTICE HIGH SPEED TAXIING!

The feel of the first (successful) take-off and landing of an airplane that you have constructed gives you a wonderful sense of fulfillment and accomplishment, a wonderful reward for the years of work and sacrifice that you have put into the project. In a way, it feels as if the airplane, itself, is saying thank-you to you. Beside that now you can answer all of the people that have been asking you for so many years, "When are you going to fly that thing? Gfaw Gfaw!! All that wonderful stuff aside, if you don't feel comfortable, are not ready, or if the astrological signs are not proper for you ------ don't fly yet or better-- get someone else to do the first flight for you... Hats off to Ron Price for admitting this and having Fearless Fred fly his for the first flight. Seeing your creation (or yourself) sitting in the middle of the runway, bent, in pieces, or worse is an expensive price to pay for **EGO.**. Flying, unlike most other past times, is very unforgiving. Stay safe and fly smart! Enough soap-boxing.

Although I have not had a large amount of time in other Dragonflies, noticeable is the fact that my memory of the ailerons is that they are fairly stiff. The servos, as described in previous DBFNs work quite well. Mine are 21"wide and I have used the left one, actuated by a MAC servo for aileron trim. A recommended item.

I have not yet deployed my belly board. Currently, with a limited number of landings without using it, I am consistently landing in about 2500' (I still won't try it on a runway less than 4600'). The negative part of the belly board installation, other than the increased building time, is added weight and complexity, especially with electric actuation. I will write with further info on the performance of this and all other untested modifications. The electric trim is quite nice and the altitude hold autopilot uses the same elevator servo mechanism for its authority..

I obtained my hoop landing gear from Skip Lawrence (a dragonflier). It is glassed into a socket made in the floor between the canard drag bulkhead and the front of the fuel tank. In accordance with his plans, massive (seemingly) amounts of glass, flox and resin hold it in. It is probably the strongest structure in the plane. I chose this configuration, after previously making and installing the stock MK II gear because of my desire not to place the landing loads on the spar of the canard. The standard MK II, however, seems to work well for others. The weight difference seems to be nil. The gear seems to be forgiving of my occasional carrier-type landings and has little tenancy to make me airmail once I have been delivered to terra firma. The Cleveland brakes are more than adequate, My initial feeling is that I must use them sparingly when landing, to avoid possible nose over.

I am using facet pumps to transfer fuel to the header tank and from the header tank to the engine. The engine does not have it's own pump, thus, becaue I rely on the pump to keep the fire lit, I have two identical pumps in series with a rocker switch to select one or the other. I have done this for both the main to header transfer pump as well the header to engine pump. I am not crazy about the noise that these pumps make and am looking for a worthy replacement.

Rocky Mountain Instruments is a small electronic manufacturer located in Thermopololis, Wyoming. They make two products for airplanes, both available fully assembeled or as kits. The engineering used in these products is exceptional. The kit building ease and the instructions are some of the best that I have seen. This excellence is only exceeded by the knowledge, courtesy, willingness to help and all around service provided by the company's principal, Ron Mowrer. I built both of the instruments that his company makes.

The Micromonitor is a microprocessor based engine monitor with appropriate alarms for exceeding or going under selected (and set able) alarm points. All readouts are given digitally. Temps are in centigrade. Although the instrument comes complete with all circuits, the owner has the option to reduce cost by not using the sensors for circuits not desired (sensors are extra, some of which are quite costly). The parameters covered by this instrument are: RPM, EGT, MP, Oil Temp, Oil Pressure, Fuel Pressure, Fuel Flow, Fuel totalizer, Carb Temp, OAT, Buss Volts, Amps, Stopwatch, Countdown timer, Clock Zulu, clock Flight time

It also has three alarm circuits for external switches (for canopy, gear,etc. etc.) the whole device is in a standard radio stack width case approximately 4" high, 6" deep and weighs less than a half a pound. It installs in a mounting sleeve like standard radios, and draws very little current. It is back lighted and self tests upon power up. It can be switched to run on a small auxiliary battery which it keeps charged automatically. I have also built a switcher that allows me to select either one of the trocoids (rotary cylinders) for EGT and also switches the amperage readings from output of the alternator to output of the battery.
Advantages: small compact unit of high quality and design. Indications logically laid out in one area. Alarms are unmistakable (both aural and visual) Loaded with incredible features. Easy to see. Building and programming instructions top-notch. Owner support unmatched. Display space small.

Disadvantages: digital display takes some getting used to, however once done is preferred as it leaves little to interpretation (redlines, etc. are set in the alarms). Temp readouts in centigrade which requires some change in thinking. (However true air speeds are calculated with centigrade temps). More expensive than Westach (however infinitely better in quality and less expensive than a collection of instruments that do what it does). All instruments are powered by the same power supply so failure mean loss of all. (The quality and accuracy of the instrument tends to mitigate this problem). Repair on any one circuit means all are down. (2 day service if necessary is the rule). DEFINITELY RECOMMENDED!

Their Micro encoder is, as the Micro monitor, a multi functional microprocessor based instrument. Its functions are as follows: Sensitive altimeter, Encoder, VSI, Airspeed indicator (mph/knots/mach), TAS indicator, D/altitude, P/altitude, true air temp(whatever that is), OAT, Airspeed trend indicator, Altitude select and hold indicator

The instrument will also give a readout of the encoder codes for verification. As with the Micro Monitor, several alarms and indications can be set. You can also set the sensitivity of readouts such as vertical speed and airspeed. It has a serial port output so it can communicate with Loran or GPS units. The readout is backlit and is all digital with the exception of a vertical speed analog (in addition to the digital) and an arrow indicating increasing or decreasing airspeed. Settable are visual alarm indications of Vspeeds, flap, gear, etc. It is mounted in a standard instrument hole through the panel is about 10" long and weighs about the same as the Micro monitor. It comes complete with all sensors.
Advantages: Like the Micro monitor it a babysitter in the cockpit. You can set an altitude on climb out, It will announce when you are within a preset distance from it and announce when you achieve it. It will then let you know if you deviate from that altitude by the number of feet that you have predetermined. Well designed and easily read display. Saves panel space.
Disadvantages: like the Micro monitor it has only one power supply. Because it is both altimeter and vertical speed indicator, If you are going to fly IFR, duplicate one or both instruments. Cost. Recommended!

I will comment on the autopilot in further articles when I have had a chance to fully evaluate it.

The intercom seems to work well when used with a tape recorder in the cockpit. The clearance recording device, works well (recording and playing back 30 seconds of anything that comes over the phones). I wonder about its usefulness, however. More on that possibly a later date.

Now to the engine:
Originally I had a fuel injected HAPI magnum Plus. I chose to replace it with the rotary because of its simplicity of construction and design (fewer than 10 major working parts) additionally it is a small and light engine for the power it puts out, and it is incredibly smooth. Power 100 take off horse power (7500 rotor RPM reduced 2.96 to 1 at the prop) Weight 114 Lbs... + approx 15 lbs. for liquid cooling system) Size About 11"" in diameter plus gear head and mounting pads. It uses a total disappearing oil system (synthetic 2 cycle) although 1/3 of the oil delivered to the engine is reclaimed and reused. It seems to use very little oil. It is designed to burn 100 LL but with proper fuel delivery can probably burn almost any fuel. The engine currently has 2 Tillotsen carbs, but a fuel injection system is now being developed. It has two plugs per trochoid (analogous to cylinders). Each plug is given juice by its own independent coil, the primaries of which are driven by 2 CD units, each unit driving one plug per trochoid for duplication. Timing is by fixed hall effect sensors on the flywheel. There is a 26 amp alternator built into the flywheel (like the HAPI). Engine case cooling is water/ethylene glycol and rotor cooling is done by forced air from a belt driven turbine,. This air cooling system also aids in the lubrication system. The engine uses a dual chamber muffler system. The majority of the noise, even at take-off is from the propeller. It feels more like a sewing machine than an aircraft engine. Because of the relatively slow prop takeoff RPM, approximately 2500, I chose a cockpit controllable 3 blade propeller. I haven't had the opportunity to really get any good performance numbers but I will forward them in future articles.

As I mentioned before, in the initial flights, I had heating (cooling) problems (as are common with new designs especially water cooled). In trying to solve the problem easily, I changed the shape and size of both the inlet and outlet areas of the cowl. The radiator, at that time was on the firewall at a 40 degree angle, baffled so that all entering air to the cowl must exit through the radiator. It seems, however that air does not like to change directions much and although I had a lot of intake area and outlet area, the path that the cooling air had to take was so circuitous that it gave it very little flow through the radiator. Thus, less than adequate cooling. I have, hopefully, solved this problem by placing the radiator in the cowl with practically straight shot for the air to enter, grab some heat and exit I also provided a electrically cockpit controllable cowl flap. Hopefully, by the time this is printed, the system will be up and flying again.

In the flying I have done with this engine and propeller combination, I find it absolutely delightful in terms of quietness, smoothness, and responsiveness. Full power with the prop at take-off rpm will lift the tail immediately if the brakes are on. I will have more data with further flight testing. Hopefully the weather will cooperate. I do have a hot water cabin heater.
The possible advantages of the engine are as follows:
Less complex and thus more reliable
Engine not pushed beyond its original design power
Smaller, lighter power package
Smooth

The disadvantages at this time are as follows:
Cost $$$$$$
Poor distribution network in the US
Inadequate knowledge and response by US representatives (mitigated by good response from England).
Higher fuel burn (will be reduced significantly with upcoming fuel injection)
Because of the limited testing I have done, I will reserve commenting on the propeller for a later date.

Building tips:

When making dry micro, to maximize the amount of micro in the mixture, lighten it, and make it easier sanding, after you have incorporated the maximum amount of micro by standard techniques, you can add a considerable additional amount of micro by using a gloved hand, in a squeezing motion in the mass of epoxy-micro.

A better option, although more expensive is a 2 part epoxy product marketed by Alexander Aero called Super-lite epoxy filler made by Poly-fiber. It has the micro incorporated into one of the two components. Mixing is easy (measure by measuring spoon) application is easier (doesn't curl back on application) sets in approx 8 hours on a normal day, and sands very well (slightly harder than lite bondo--much better than micro--use 40-80 grit).

Before bondoing the level boards on the wing and canard, It is vital that you check that the water level is still level. Better yet, make jigs to ascertain this.

When doing the electrical wiring on your aircraft, plan, plan, and plan some more. Then prefabricate a wiring harness for what you need and add at least 25-50% more wires in the bundle for future use.(label them well).

While in construction postpone putting the wings and canard on till the last possible moment. This saves miles of walking around these structures while finishing the fuselage. (You will also spend less time mindlessly but happily gazing at your winged bird. (The fuselage mounted bow-type gear is a positive here because you can have it on its's wheels without the canard.

If you are going to use wingtip lighting, run your wires through a conduit. Make your conduit double the size that you think that you will need. It's much easier to run the wires in larger conduits and if you decide to change your plans, or retrofit a new system.

Make as large a forward hatch as possible. Working directly over the canard is tough enough. Make things easy on yourself.

Hinging or making your hat section (over the wing) removable is desirable because it allows you to access the tail and aileron linkages without making yourself into a pretzel.

Remember what Nate Rambo said and use Electric pumps for fuel. The fuel head (which creates the fuel pressure to the engine in a gravity feed situation)is marginal on the dragonfly to begin with and in a climbing configuration can be disastrous. (The lower you mount your carburetor increases the head) The varying head with aircraft pitch attitude causes a variation in fuel pressure to the carb which, depending on the carb can cause trouble.

When making multiple ply layups that don't have to have compound curves lay up all the plys on a workbench covered by a piece of polyethylene or similar material. (I use plastic garbage bags). Saturate, squeegee and get your material/resin ratio proper. Place an additional layer of plastic on top of the lay up, squeegee that down. Cut the lay up to size (through the top layer of plastic, fabric and the bottom layer of plastic)with a straight edge and mat knife, paint a thin layer of epoxy on the structure where you are going to put the new lay up, carry the plastic encased lay up to the area, strip one of the plastic covers off, put the lay up in place then remove the outside layer of plastic. Stipple with paintbrush, a quick final squeegee and peel ply if you desire. The fiberglass being sandwiched between the plastic sheets will not distort in cutting (with rule and knife (don't use scissors)) and the whole lay up, regardless of size will be very easy to transport. Taking one cover off will allow bonding , and positioning on the aircraft with more flexibility of the lay up. It will also (unless extremely wet and heavy) stick where it is put (especially important on non horizontal surfaces. You have the advantage of optimizing epoxy-cloth ratios, easy positioning during wetting and lay up, ability to cut to accurate size and easy application, even in tight areas or awkward positions.

Dusting the surface with microbaloons does not seem to extract much epoxy from the lay up. It does leave a more easily sandable surface although the process is messy and you have trouble inspecting and evaluating the finished lay up because the micro creates an opaque surface.

If you are going to make a cowl, wheel pants etc. yourself, create the shape with foam, cover the foam with light weight fast drying spackle(premixed), let dry and sand. Do not follow Tony Bingalis' advice and spray primer, or any other paint-like substance on the plug for surfacing. This will leach through the thin areas of plaster and uncovered foam and dissolve the foam away, doubling or tripling your work. Instead, after the plaster/foam structure is smooth, coat with 3 coats of a good urethane varnish. Let dry overnight. Then paint on Film # 10 (available at Wicks/ACS), allow to dry according to the instructions and apply glass. I did not find it necessary to apply wax.

Safety Item

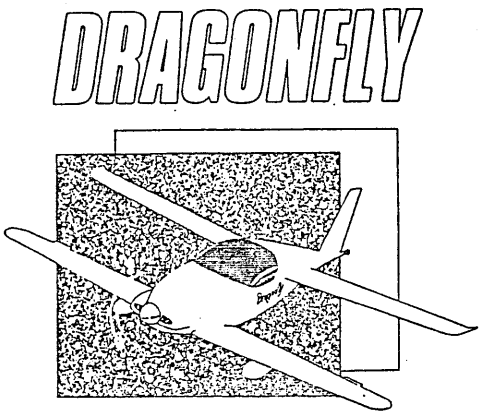
One of our dragonflyers complained that on his plane, which

he had purchased from another builder, he had found the holes in the metal inserts in the canard drag bulkhead were enlarged which allowed the canard to move. He surmised that this was probably the previous builder's attempt to easily change the angle of incidence of that surface without doing a lot of work. While this may have been the case, some additional thought yields a potentially different scenario, one that may have safety ramifications for all flying Dragonflies. The way that the canard drag spar is bolted to the drag bulkhead, unlike all of the other support fittings, is a blind joint. Since there is a glass buildup over the steel inserts and the area is poorly visible, we really can't visually determine if the bulkhead is really tightly clamped to the drag spar with the mounting bolts. (Remember, the purpose the bolt is to create a tight friction joint, not to be a supportive member itself.) It is possible, that with excess clearance between the drag spar and the bulkhead, that a bolt placed through the aluminum bulkhead insert into the tapped steel plates will have it's threads bottom out in the plates before drawing the two structural members tightly together. But, it will look that way. The bolt will show the proper torque value, but will let the two surfaces move with respect to each other, increasingly wearing the hole in the insert larger and larger as the canard exhibits more movement on the ground and in the air. This might be a good thing to check.

I would like also to purpose that, as a group, we create a generic Dragonfly annual inspection list. There are enough d-flies out there with advancing hours to give us knowledge of the weak points which need more care, as well as to help us all in our conditional inspections. Of course, engine installation and modifications would be up to the individual. Perhaps Spud will serve as a clearing house if we mail or E-mail this info to him (he needs something to do anyway).

More to come as more data becomes available

Rich Goldman
N222TH
2349 Arbeleda Ln.
Northbrook, IL 60062
(847)498-4444
E-mail ARGOLDMAN@aol.com



PHOENIX FLY-IN PICNIC

1996 Phoenix Dragonfly Club Fly-in Clinic

Sponsored by: Phoenix Dragonfly Club

What: Annual Dragonfly & Q-Bird fly-in picnic

When: March 23-24

Where: Deer Valley Airport (No. side of Phoenix)

Contact: Matt Gunsch (602) 252-4720

Food: Picnic will be furnished compliments of the Phoenix DF builders.

Fun!: Comraderie, blue skies, warm sun, nice facilties, free shuttle to motels, tie downs and hangar available!

MULTICOM

● Newsletter Input comments

As for the newsletter, I would definitely, absolutely like to hear about what other people are doing and thinking. If we don't have a chance to combine and maybe blend ideas, we will all be doing our innovations alone. It's great to hear what works or doesn't work for other builders. Isn't that what the newsletter is for? It might be more important for builders to be able to ask for some opinions before they go out and fly their new ideas than to just tell what happened after. That's my opinion. **Bob Stieg - Rockford, IL.**

A comment on your recent "Editorial" on what to print: You of course have the final decision (and should have) as you are doing the work. There is almost no way you can or should be expected to determine the validity of some claims and ideas put forth. The merits of the ideas presented can only be determined by the individuals writing and reading them. If there was some way to pre-qualify some of the articles it would be great. If it was possible to verify or require that the individuals had read all of the newsletters and viewed the construction videos it might help to eliminate a "re-invention of the wheel". The rudder control modification is one in case in point, and the use of micro balloons on a fresh layup, covered by Patrick Taylor in the videos, is another. I guess that we readers will just have to learn to "separate the wheat from the chaff".

Henry Roden - Olympia, WA

MULTICOM CONTINUED ON PAGE 10

BRAD AND BETH'S EXCELLENT ADVENTURE!!

Hi Spud: With New Years just celebrated, it was a time to reflect on 1995. Certainly one of the highlights was the trip to Oshkosh with my wife, Beth, in the Dragonfly. We were very far behind as the end of July approached, both at the job and at the airport. Finally I called Beth to meet me at the airport saying we "shall" depart this afternoon. She rushed to the airport, and as she got there she was saying "are you sure we are going to make it for Oshkosh 95?". We left Chino, California that afternoon, 1 1/2 days behind schedule but this was the toughest part. From then on it was a most eventful, exciting, and trouble-free adventure--Smooth Sailing. Before starting the trip Beth said she might return from Oshkosh by commercial flight as she was mostly concerned about the bumps. She had such a great trip east that it was never discussed again. She was invaluable, doing most of the navigating. Now I know why she gave me the Garmin 90 GPS (this is a great little unit) for Christmas last year--so she can see more of the sights!

Brad and Beth coming up on the Grand Tetons!

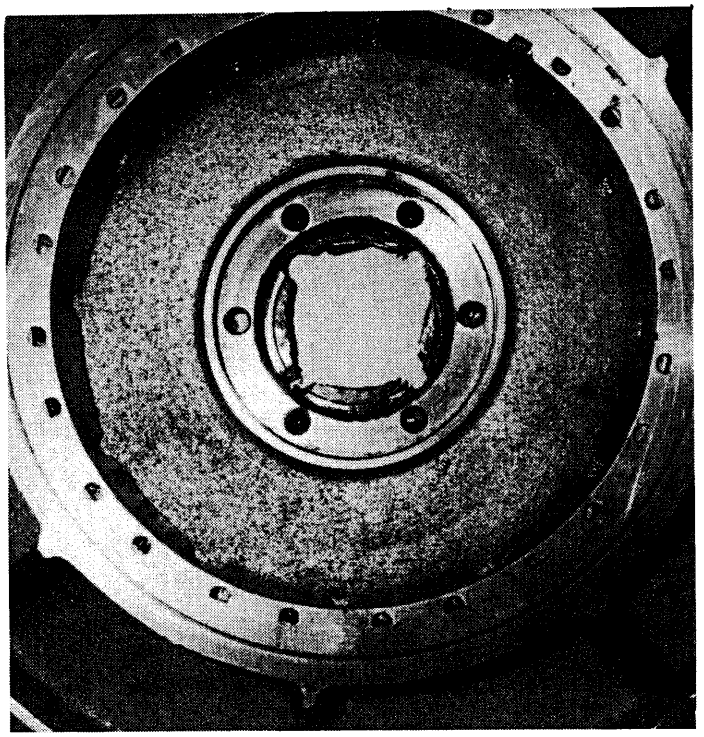
Let me give a quick summary of the trip:
To Oshkosh: Chino - Bullhead City, AZ. - Cortez CO - Garland, KS - Ames, IA - Mason City, IA - Wisconsin Dells, WI - The Big O. (14.6 hrs/55.1 gals)
Visiting Family/Friends: Oshkosh - Angola, IN - Dayton, OH - Griffith, IN
Return to CA.: Newton, IA - Mitchell, SD - Rapid City, SD - Rock Springs, WY - St. George, UT - CHINO
Totals--(Approximate) 42.4 hrs 151 gallons fuel

Oshkosh was the Grand goal, and we made it. It was such a pleasure to meet you in person (and your family), after talking on the phone for so long. We shared a lot, talked a lot, and answered a lot of questions from everyone who came by-it couldn't have been more fun!! (Beth answered all the questions the judges had as I was not there when they came). And we could have spent more time there, we just ran out. The DF Forums and the DF Dinner--these were some of the highlights, to share with other builders, pilots, and friends. Great Job Spud, and thanks for all your time and effort. Our intent was to play and that we did, seeing family and friends and giving rides, and stopping at Mesa Verde CO National Park and MT. Rushmore. And I can't say enough about the people we met, so many nice people (It's hard to stop for a "short" fuel stop!). They gave us cars to drive (even overnight), free hanger space, helped with hotels when there seemed to be none available, etc. One "EZ" pilot even offered to share his hotel room if we could not get one (I think we would have waited outside while he explained this to his wife?!).We flew every day we wanted (12 of 15), only starting late one day due to rain and another because of fog (3 days on the ground at the Big O). Yes, we did have some luck. We tried to break up the flying so as not to spend full days in the cockpit, and this worked well. We also departed early to miss the bumps and wind. We departed from Cortez, CO for our trip over the Rockys at 6:06 AM--it was beautiful coming over the pass west of Pueblo at 13000+ feet!!The Oshkosh Award certainly was the icing on the cake, and this trip was definitely the Event of the Year for us with the Dragonfly! But we have made several other great trips too. I've enclosed pictures from the Grand Tetons and Lake Havesu. Our memories have the best pictures...By the way, the Dragonfly still gets some use, now about 280 hours in 15 months *(Wow, That's 18.6 hrs. per month!)*! Looking forward to our next meeting, Spud. The Best for the New Year!

Brad and Beth Hale - 6778 Naomi Ave
Buena Park CA. 90620 - (714)-523-9197

FLYWHEEL PROBLEM!

I guess this is old news by now *(This is the second one that I'm aware of - Spud)* given the feedback I received from Steve Bennett of Great Plains Aircraft on broken flywheels. However enclosed is a photo of the flywheel from my HAPI 60-2 DM engine after 250 hours of operation. I discovered this as a result of an oil leak from the rear seal which I think was damaged by debris from the flywheel. Judging by when the leak started I would guess I was flying behind this flywheel for about four months with it cracked right through. The cracked surface was was quite worn so it clearly didn't just

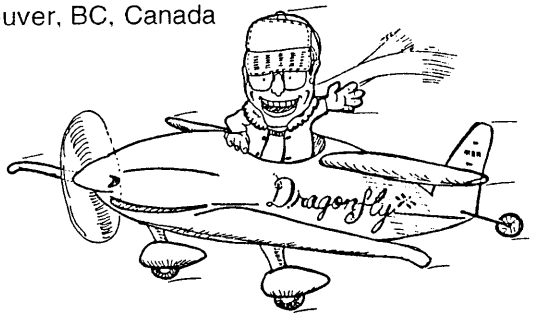


occur recently. At least it is not a catastrophic problem as the flywheel still takes torque even though it is not solidly attached to the crank. I am now back in the air with a replacement <u>steel</u> flywheel from Great Plains. I would recommend that anyone with an original aluminum flywheel replace it at their earliest opportunity whether there is an indication of trouble or not.

Thanks again for the great newsletter.

Peter Judd

Vancouver, BC, Canada



<u>MULTICOM CONTINUED</u>

In regards to your comments on belly boards and other mods in issue #62, I'd just like to chime in to agree with you. Choices must be made available so that people can then freely select that which most fits their particular desires and skills. Homebuilding is the only remnant of aviation where true individual choice still exists. There are two types who strongly conflict with this concept of individual freedom - the one who says. "You've absolutely got to do it my way!" - and worse; the one who says "You've absolutely got to do it the way the bureaucracy taught me!"

My Choice is no belly board. My wife and I have no problem with flying sideways. Some pilots (and many passengers!) do indeed have problems with such flight attitudes. Though adding a little more complexity and weight, the belly board appreciably reduces the pilot skills required to consistently and safely accomplish shorter landings. This is particularly important when you are tired after flying all day, especially if somewhat less that ideal conditions exist at your destination airport. - Buck & Jo Buchanan - Groveland, CA

Sorry no Sun N" Fun.....I am sorry I will not be attending Sun N" Fun in Lakeland, Florida. The trial for the attempted murder of my son (Ryan) starts that Mon., April 15th, 1996. If it wasn't for the several death threats made to our family over the phone just after the shooting's I would of come down for Fri., Sat. & Sun. I feel these calls were meant only to intimidate Ryan not to testify. The police & DA office that these could reoccur just prior to the trial. You just never know and I can't take a chance. Time has also got away from me in order to prepare any type of dinner or forums. I am truly sorry and I can only say we'll shoot for next year. I am already working on a dinner and forum for Oshkosh. Again I am sorry - Spud Spornitz

THE CLASSIFIEDS

<u>Great Plains Aircraft Supply</u> - Quality Aircraft Parts, Excellent Service & Support at Reasonable Prices Since 1982 - We have a full line of assemble and tested VW based aircraft engines, short or long block component packages - assembled or in kit form. We have individual components, quite a few replacement parts for Hapi engines, props and many accessories. 64 page catalog and technical manual still only $3.00!! send for yours today. Our business hours are Monday through Friday 8:00 AM to 6:00 PM and Saturdays 8:00 AM till NOON Great Plains Aircraft Supply P.O. Box 545 Boys Town, NE 68010 Phone (402)493-6507 Fax (402)333-7750

<u>For Sale:</u> Dragonfly project. VW engine and prop, instruments, canopy. Needs canard and some type of gear setup.

Great airplane but need a four place aircraft. $3,800.00 or trade for 4-place plane or Cozy IV project. Ask for David (941) 772-3841

LETTERING BY ROBERT! **- "N" NUMBERS AND MORE!** High quality self-adhesive aircraft numbers. Numbers and lettering in any shape, size and color. You'll love our work - 100% satisfaction guaranteed. Pricing - 1"-.35, 2"-.55, 3"-.75, 4"-.95, 5"-$1.15, 6"-$1.35, 7"-$1.65, 8"-$1.95, 9"-$2.35, 10"-$2.75, 11"-$3.15, 12"- $3.45. Postage and handling $3.50. Ask for Robert after 6:00 p.m. (913) 648-4022 or E-mail "apwrobert@aol.com or mail to 6501 W. 80th Terrace, Overland Park, KS 66204-3823

For Sale: Hapi 60 hp - 60-2DM engine with Tillitson carb, Hapi alternator/accessory case and slick Mag (a real plus). First $1500.00 Ask for Paul Dickison (606) 654-6068

For Sale: 1 pair of Mark II fiberglass gear legs, brand new, as shipped by Viking plus complete set of Mark II pressure pack hydraulic disc brakes including axles, bearings, wheels and mew 500 X 5 McCreary aircraft tires and tubes as described in D-fly newsletter #17. If you buy the whole package, I will give you super deal and throw in an extra set of brake linings, too. Call for more details, Guenther Kaelberer, 11233 w. Olive Dr., Avondale, AZ Phone/Fax (602) 877-3157 or leave a note on Compuserve #75231,731.

Wanted: I am looking for "original" copies in good condition of the "DRAGONFLYER" newsletter issues #1, #3, #7 and #19. Will pay fair price. Spud Spornitz (913) 764-5118 or mail to 1112 Layton Drive, Olathe, KS 66061

For Sale: All new, never used. Diehl Super Case, flywheel, starter, Mag drive, slick mag & harness, No alt. components. Q-2 style motor mount. VW taper prop hub. All of the above items $800.00 or best offer. Ask for Floyd after 6:00 pm (816) 836-0354

For Sale: Dragonfly project, includes zero time Hapi built (60 hp), mount, spinner, instruments, second set of heads for dual ignition. Two fuselages one scratch built, other snap dragon, elevators, ailerons, two sets of plans. Wing and Mark i canard (not filled) metal parts, foam, cloth, tires, some flight instruments and more. Over 11 invested $5500.00 OBO Call Phil Jones (414) 367-0181

For Sale: Subaru EA82 engine, single port heads & throttle body injection, drive accessories, may need work, I was told it was running. Should be properly checked out. 3-speed trans (for prop reduction?) and some other stuff. Make offer, all or part (try to make me mad). I gear drive starter from Mosler, special to fit the Hapi accessory case. Paid $165.00 new, never used. Make offer. Asuza wheels, axles & drum brakes from Mark I, make offer. (815) 397-1533 days Ask for Bob or Ken

For Sale: 80 hp Hapi Engine with Scat split heads, Hapi alternator/accessory case and dual electronic ignition. Recently freshened by Gene Evens'. Engine has had a prop strike, crank prop flange dials out good but should be checked before flight. Complete less carb and lower intake section. . First $2200.00. The heads, alt/accessory case & dual ignition components worth more than the $2,200. Spud after 6:30 CST (913) 764-5118

Wanted: Your extra materials, looking for canopies, 5" carbon fiber (for spar caps), bi or uni cloth, blue foam, Instruments, etc. Spud (913) 764-5118

NOTE: Who's ON-LINE will return in the next issue.

Subscribers Information Center

Dragonfly Builders & Flyers Newsletter (DBFN) is currently published Bimonthly at a rate of $3.00 per issue/$18.00 a year in U.S. $3.33 per issue/$20.00 a yr. in Canada, Alaska & Mexico. $4.83 per issue/$29.00 a yr. (U.S. funds) per 6 issues to foreign subscribers. Send remittance to: DBFN, 1112 Layton Drive, Olathe, Kansas 66061. **PLEASE MAKE CHECKS PAYABLE TO: BILL SPORNITZ**

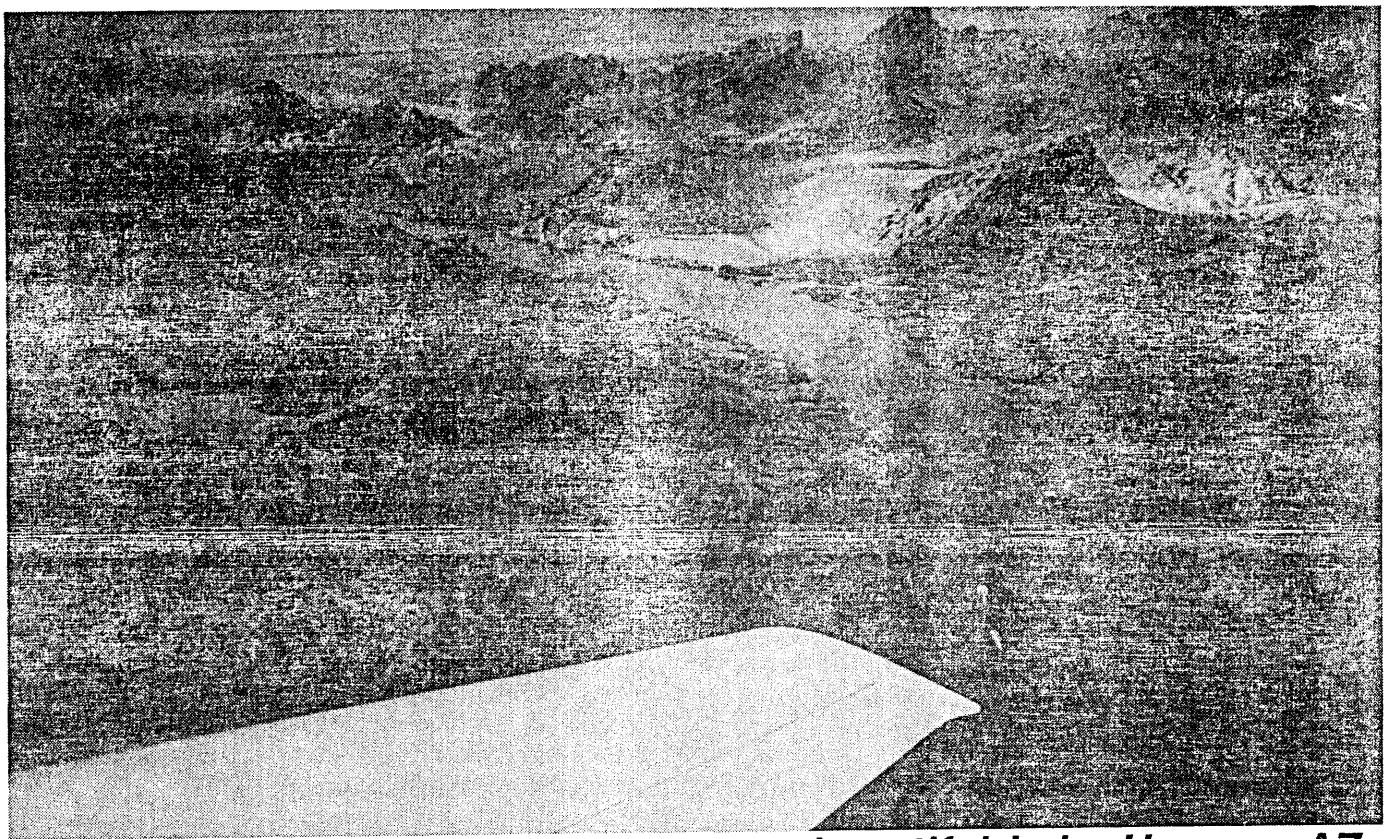
Ideas and opinions expressed in DBFN are solely those of the individual submitter. This information is for educational purposes only! Application of these ideas and/or suggestions contained in DBFN are the sole responsibility of the experimental aircraft builder at their own risk, which could result in builder/pilot personal injury or death. DBFN does not imply or suggest in any way their usage.

Letters, Pictures and computer supplied data submitted to DBFN are subject to final screening by DBFN / Bill ``Spud" Spornitz and may be restricted, deleted or revised. Material returned by request only.

Classified advertising; (non-commercial) for current subscribers may place an ad of 50 words or less for $6.00 per issue, with one photo a additional $12.00. Back issues of ``Dragon-Flyer", ``Dragonfiles" & ``DBFN ``are available at $3.00 each.

The use of ``VW" or Subaru by DBFN is for the sole purpose of application and description only and is not intended to infer or imply a direct connection between DBFN and Volkswagen or Subaru.

1-913-764-5118



Brad and Beth Hale took this shot over beautiful Lake Havasu, AZ on their return home from Oshkosh in their Dragonfly..... You people that are still building, some day you can take this shot in <u>your</u> Dragonfly!

DRAGONFLY
BUILDERS & FLYERS
NEWSLETTER

1112 LAYTON DRIVE
OLATHE, KANSAS 66061

<u>FIRST CLASS MAIL</u>