

# DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

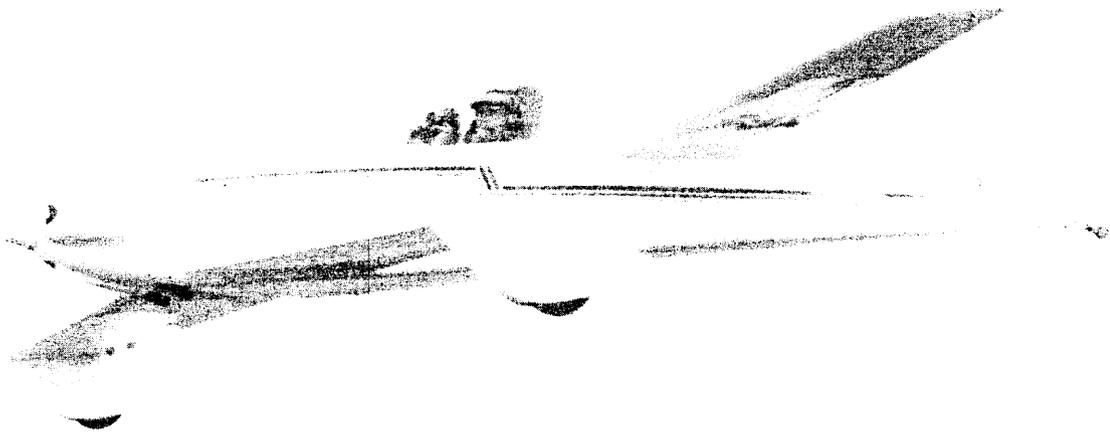
THE OFFICAL VOICE OF DRAGONFLYERS ALL OVER THE WORLD

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MARCH - APRIL 1994

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## **LEN GRIFFIN OF SILVER CITY, NEW MEXICO MAKES "HIS" FIRST FLIGHT IN HIS MARK I**

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Len Griffin was fortunate enough to purchase Del Bradley's beautiful Mark I Dragonfly. Del's Dragonfly has been the "Benchmark", "The Standard to Shoot For" for many a Dragonfly builder and myself since we first saw it at Oshkosh in the late 1980's. Len Griffin has taken this airplane home and even refined it more.

Hi Spud,

I have finally solo'd N826DB, after many hours of dual and the plane is fantastic! I have it back here in Silver

City and have been flying it regularly.

All the pictures I've seen show there birds on the ground, so just to prove they do fly!

Some rough initial data on N826DB, cruise 140 mph indicated and burns 3.6 to 3.7 gph at very near full gross.

It everything goes well hope to see everyone at Ottawa, Kansas on Labor Day weekend at our annual fly-in !  
Len Griffin - Silver City, New Mexico

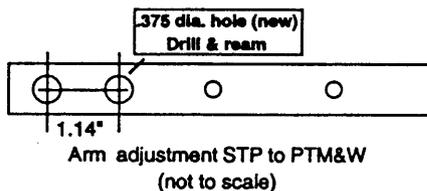
# EPOXY UPDATE

## The Great Epoxy Caper or Just What to Hell Epoxy Should I Use?

To follow is a collection of excerpts, comments and facts taken from Dragonfly builders and several other composite aircraft newsletters. Also a follow-up call to Hexcel themselves.

I hope everyone has been following the changes that have occurred to the epoxy system that we use during construction of our Dragonflies, if not I suggest everyone refresh by reading DBFN #46-page 4. "In a nut shell", Hexcel's Epolite I & II (alias Safe-T-Poxy I & II) has been discontinued because it had a chemical, MDA, which has proven to cause cancer in laboratory testing. The Rutan Group (these guys be the pro's) had intensely researched all available epoxies on the market at that time and came up with a suitable replacement called PR2032/PH3660-2 or now know as PTM&W.

One of the only negatives of the PTM&W is that it requires a scale or pump change. The old Hexcel had scale ratio of 100 to 47. The PTM&W ratio's are 100 to 31.3. I've had numerous request on how to change over the Michael's Engineering Stick Stuff Dispenser. Please find below a excerpt from the 1994 Wick's catalog (sorry for the delay).



**CHANGE PUMP:** To change from 47/100 to 31.3/100 by volume: Move the pivot 1.14 to the right. Drill a new .375 dia. hole for the pivot bolt, using a 23/64 dia. drill and a 3/8 or .375 dia. reamer. Drill a new 5/16 dia. mounting hole in the steel bracket 1.14 to the right of the original. Measuring upward at the angle of the operating handle is best but moving horizontally is alright. Make sure that the connecting links are aligned straight up and down when the operating arm is horizontal. This will convert your pump from Safe-t-poxy to the PTM&W

Below is a letter from David Morris, Dragonfly builder out of Garland, Texas with his comments on PTM&W;

"My wife likes me again! She thinks I've quit working on the Dragonfly. Actually, what's happened is that I've started using one of the new epoxies. PR2032 and PH3660 or what is sometimes referred to PTM&W, recommended by the Rutan to prevent cancer, kidney and liver failure, and all the other nasty little side effects predicted by the EPA for SAF-T-POXY. The hardener (PH3660) will remind you of dirty baby diapers (if you're stupid enough to sniff it in the can), but after it's been

mixed with resin, it's practically odorless. Thus, our house is longer saturated with noxious (and, now we know, carcinogenic!) fumes every time I do a layup.

PR2032 and PH3660 produces a much clearer mixture that doesn't discolor your white foam after it's been laid up. So your parts end up staying whiter even after cure. That might be a blessing when you start the exterior finish. The mix ratio is radically different, but it took me only about 10 minutes to build a new epoxy scale for the new ratios. The resin is much more viscous than the hardener, you have to be more careful to stir it up completely - you don't get any visual clues. I've also noticed that knife trim stage doesn't develop until several hours later than with the older epoxy, but overall cure time seems to be about the same.

Hopefully, the new epoxy will be kinder to us in the long term, healthwise. In the short term, it has allowed me to sneak out into the garage and do layups even when the house is occupied. I'm not the one to preform any kind of engineering analysis on it, so I hope it's as strong as Rutan says, but I highly recommend it for "environmental" reasons!"

David Morris  
Garland, Texas



Well in the meantime, Hexcel has come out with their replacement, Epolite 2427. There is some nice advantages over the old Epolite (Safe-T-Poxy) and even the new PTM&W.

To follow was gleaned from the Central States Association Newsletter, a independent "SUPERLATIVE" newsletter published by Terry Schubert, Olmsted Falls, OH for the Vari-EZ, Long-EZ & Cozy and from the Cozy Newsletter published by Nat Puffer. Again, these airplane types use the same construction methods and materials as the Dragonfly & Q2/Q200 group.

(From Central States Winter 1993 issue)

Epolite 2427 Hexcel's New MDA Free Epoxy

Hexcel has completed development of a MDA and styrene free epoxy system. Samples have been shipped to determine user reaction. Carl Denk, local Cozy Classic builder, obtained one of these quart samples of the new Epolite 2427 and we tried it out last night on some test pieces. I (Terry Schubert) did a 4 ply BID tape and a 3 ply inside corner. The resin was at an ambient temperature of 70 degrees.

This replacement system uses the same Epolite (Safe-T-Poxy) resin (the clear stuff) but a new low toxicity hardener #2427, formulated only from compounds that are on OSHA's approved list. It appears to be of lower viscosity (thinner) than the standard

Safe-T-poxy, wets out quicker, and has a very low amount of odor. The hardener is light amber in color and has a sweet smell which reminds me of the West System Hardener.

Epolite 2427 is compatible with Safe-T-Poxy and PTM&W's PR2032. It uses the same mixing ratio as the old Safe-T-Poxy I & II so you can use your epoxy pump without modification. As the new system changes only the hardener it appears you need only to discard your old hardener to be within safety compliance (more on this later in this article - Spud).

Physical properties are reported to be equal to Safe-T-Poxy except stronger in impact resistance. It is superior to the RAE resin system in compressive, tensile and flexural strengths as well as in temperature resistance.

The vapors are heavier than air so ventilation equipment should pickup between the bench and floor level.

And from Central States issue #34 April; Brent Van Arsdell - I just ran out of Epolite (Saf-T-Poxy) 2183 hardener but had plenty of Epolite 2410 resin left. I called Wicks to see if the new hardener could be used with the 2410 resin. They said the new hardener 2427B needs to be used with 2427A resin.

I called Hexcel for verification at (818)882-3022 and talked to quality assurance chemist Deidre Crutchfield. She said the new hardener would work with the old resin although IT WOULD NOT GIVE THE BEST RESULTS. She said that combination would be OK for NON-STRUCTURAL application, however.

The new epoxy uses the same ratios as the old ones. You can order the resin from Wicks as number 2427A and the hardener as part number 2427B. Your liver will thank you!

(From the Cozy newsletter)

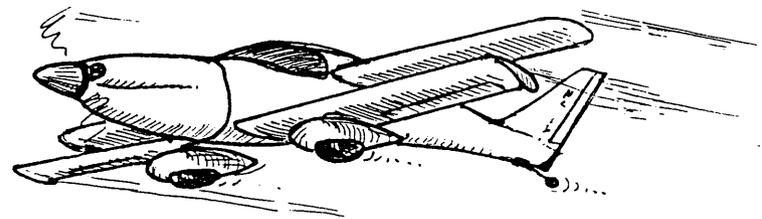
I (Nat Puffer) have obtained a gallon of the new Epolite 2427 and have used it on numerous layups. It has a viscosity of 1000cps, which is much lower than the recently approved PTM&W PR2032, and is much faster in wetting out and easier to work with. It is now #1 on our recommended list. Some of our builders, who have already switched over to the #2427 have been very impressed. If you have already built parts for your airplane with Safe-T-Poxy, RAE or PTM&W, there is no need to worry because all of these epoxies have acceptable properties and adhere to each other if the surface has been properly prepared.

I contacted Patrick Taylor of Viking, who has just finished up doing his own research on the new Epolite #2427. He concurs with all the findings the above people have found. He also gives it his Number #1

recommendation, followed of course by the PTM&W.

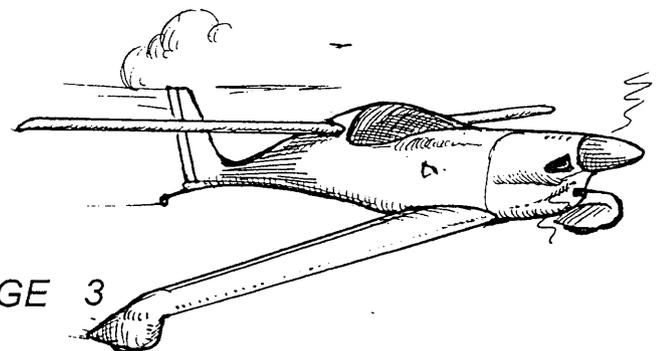
I called Wicks Aircraft in February to order some 2427 and they said it had been recalled????? They said it was sent back for a formulation change. I contacted Hexcel for the straight scoop! I talked to Phil Cuthbert who was very knowledgeable on the new epoxy. They had found out from feed-back from the earlier samples that they had sent out that some builders were having a clouding problem after about 7 to 8 days. What was found is that the new 2427 is very acceptable to moisture absorption. Hexcel changed the formulation very slightly to help hinder this problem, but Phil says that the builders will have to be very cautious to properly reseal their containers. He even suggests that if it is to be any extended time, it would be a good idea to return the hardener/resins to their original containers - Spud.

I have not used either of the new epoxies as of this writing, I plan to order the new Hexcel 2427 within the next couple of weeks, but when one reviews all the numerous advantages of either of these new epoxies it seems like a "NO BRAINER" - Spud



## 1994 CALENDAR

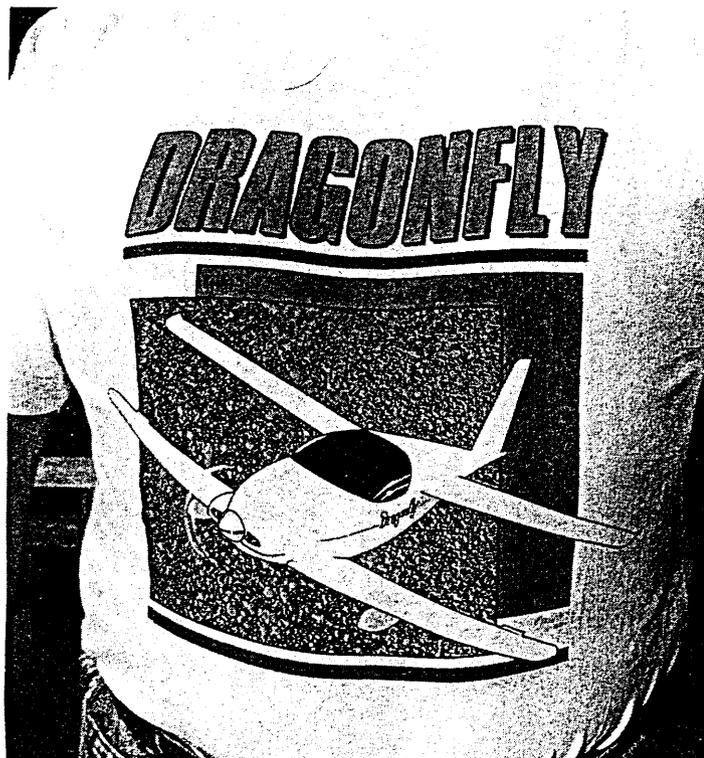
- *June 17,18,19, 1994 National Gathering for Canard Type Aircraft - Johnson County Industrial Airport, Olathe, Kansas - Contact: Terry Yake 8904 West 116th Terrace, Overland Park, KS 66210-1963 (913)451-8904 (this event is primarily Vari-EZ, Long-EZ and Cozy, Defiant, Etc. and we are welcome)*
- *July 27 - August 2, 1994 EAA Annual Convention and Fly-in, Oshkosh, Wisc.*
- *September 2,3,4, 1994 4th Annual Dragonfly/Quickie/Q-2/Q-200 Fly-in, Ottawa, Kansas*



## IT'S T-SHIRT TIME!

Ok gang it's T-shirt time again! Enough people have worn out there other ones so let's run another batch. I can't believe it has been that long since we last produced the shirts.

It very important that everyone understand that we need to "Pre-sell" these. That is we need to know sizes, quantity and the payment needs to be made at time of order. **We will not be running any extra's!** Also everyone needs to get there orders in as soon as possible and don't drag their feet. We had quite a few people that missed out last time because they took their sweet old time. Last time we ran shirts it took 6 to 8 weeks from the time that the newsletter came out and they were delivered.



Here's a picture of what they look like. I surveyed several people and they just soon stay with this design, they said people were very complementary about the design and the colors. Also last time we offered colors, we are going to simplify things a little bit by staying with white only!

The shirts will be "Fruit of the Loom" 100% preshrunk cotton or equivalent.

Pricing will be as follows;

T-shirts - \$10.00

Sweatshirts - \$18.00

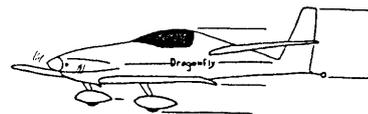
Personal checks are fine, make payable; "Bill Spornitz"

Shipping charges will be \$4.00 for the first shirt and \$1.50 for every other shirt after the first one

Canadian charges will be \$5.00 for the first shirt and \$2.00 for every other shirt after the first one.

Overseas is expensive! They will be about \$9.00 or more. If more I'll write you back

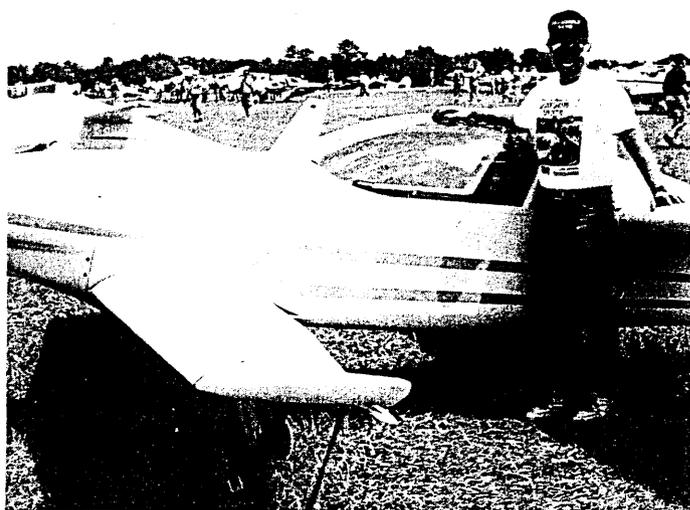
Please write out your order on a pieces of paper, quantity, sizes and shipping charges. We had to call or write quite a few last time, PLEASE! - Spud



## SUN N' FUN 1994

The weather at this years Sun N' Fun couldn't have better right there in Florida, but North of Florida it wasn't to good and I'm sure it stopped a few folks from coming. The only Dragonfly that we fly in this year was Fred Weibe's out of Marseilles, Il. up by Chicago. Who was featured on the front cover of DBFN #51.

We had 48 people in this year forum which was on Monday morning. The hour was split up and the first half was devoted to the new people and the last half was for the veteran builders and flyers. - Spud



**Smiling Fred Weibe and his Mark II**

# MORE GOOD NEWS, MORE BAD NEWS

Hi Spud!

Let's talk about the good and then we'll talk about the bad!

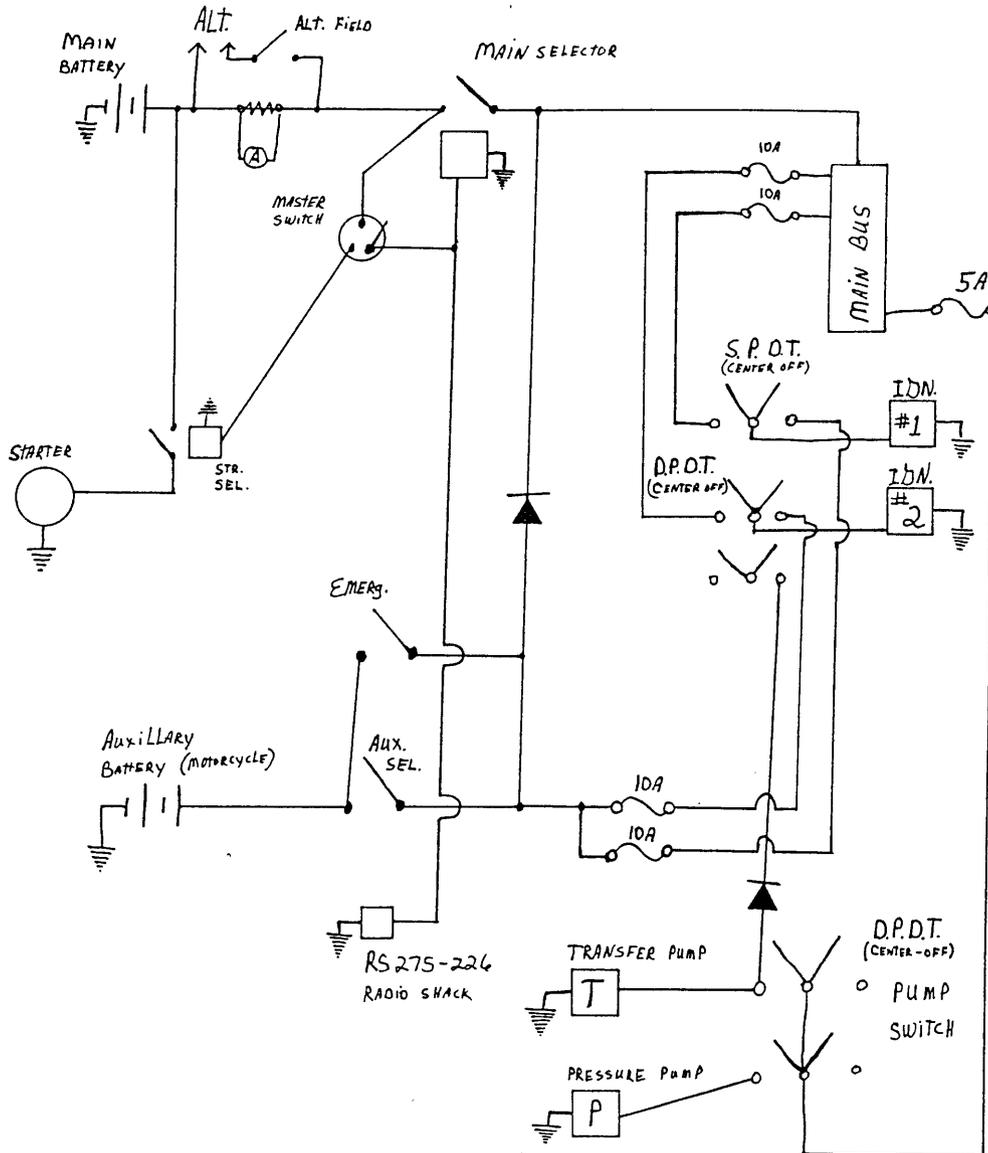
Lets talk about those gap seals. I installed the plastic "V" shaped seals made by "Frost King" at \$3.50, this was going to be a cheap experiment. I put the seals in just deep enough in the bottom of the elevator socket so you couldn't see them.

Now because of these seals my Dragonfly no longer drops it's nose in the rain, it now very slightly pitches up in light rain (all I could find). Another bonus benefit from the seals was that my stall speed "-decreased" by 5 mph and my cruise speed went "up" 5 mph to 155 mph at 3200 rpm measured by my Loran.

Now the bad! Unfortunately on December 22nd all testing came to a sudden halt when the engine stopped at an altitude of about 1300 AGL. Unable to restart the engine, I had to put the DF into a field that was surrounded by tall trees. I took about two feet out of a long needle pine

and stalled into the open field, dropped about 40 feet, hit fairly flat with a +10G to -4 1/2G bounce (I had a G-meter in the plane) and about 180 degree turn backwards coming to a stop with a broken canard and one gear leg. I didn't get hurt.

The cause of the engine failure was due to a 25A breaker between the battery and the buss bar that the plans call for. There was about a 22 amp load on it to open, but not pop out!



I would strongly suggest a review of your wiring and if you wired in the 25A breaker or fuse like I did, get it out of the circuit it's not needed! In the drawing you'll see my solution to eliminate this from happening in the future, which includes two batteries. If anyone has any questions about this circuits please give me a call. (904)347-0456.

I'm well under way to having a new canard built and should be flying late summer or early fall.

Chuck Ufkes  
Ocala, FL



# FOAM SEATS

Hi Spud

Here's the information for the Dragonfly seat foam.

The two drawings are what I drew up and gave to our 8 people here in the Phoenix builders group. These drawings are informal, but included all the pertinent data to make the seat cushions.

We ordered enough for 8 Dragonflies, therefore obtained a price of \$86.60 per 36" X 80" sheet of Confor Foam. I was initially given a price of a minimum order price of 240 sq. ft. at \$97.65 a sheet, but of course we ordered 15 sheets. At the normal price the foam calculates out to 3.9 cents per sq. in., and the 240 sq. ft. quantity equates out 3.0 cents per sq. in.. The Temperfoam price at last years Oshkosh was 9.5 cents per sq. in., therefore even if you figure at the 3.9 cent price, 2 Dragonfly seats will costs about \$180.00 to \$200.00 a considerable savings. It is well worth the investment for the comfort and the safety increase in the event of a forced landing.

The product we are talking about here is called TDS-13 Confor Foam. It is manufactured by;

EAR Specialty Composites

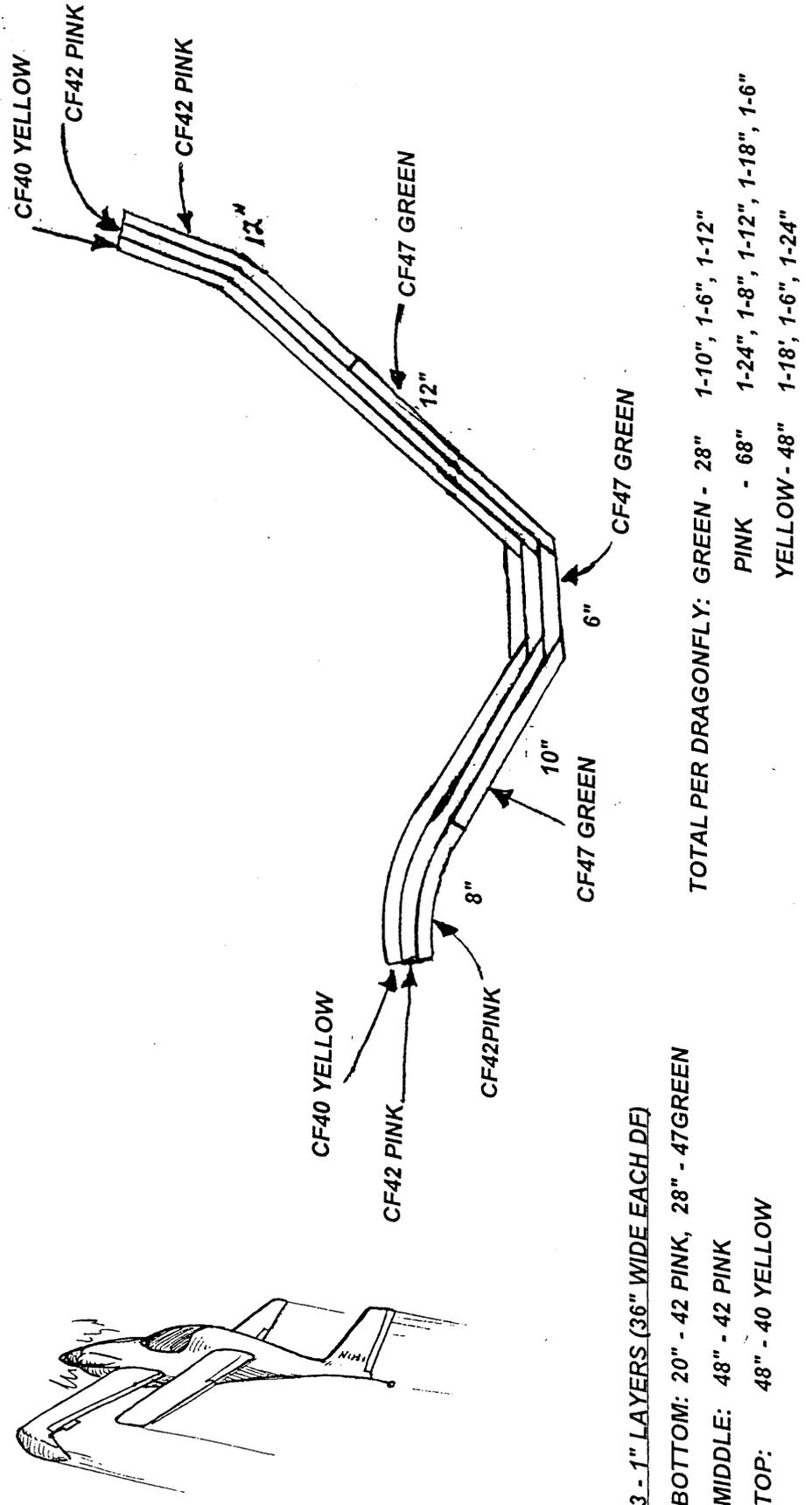
7911 Zionville Road

Indianapolis, Indiana 46268

Phone (317) 872-1111.

They have distributors all over the U.S., give them a call and ask them for their closest distributor.

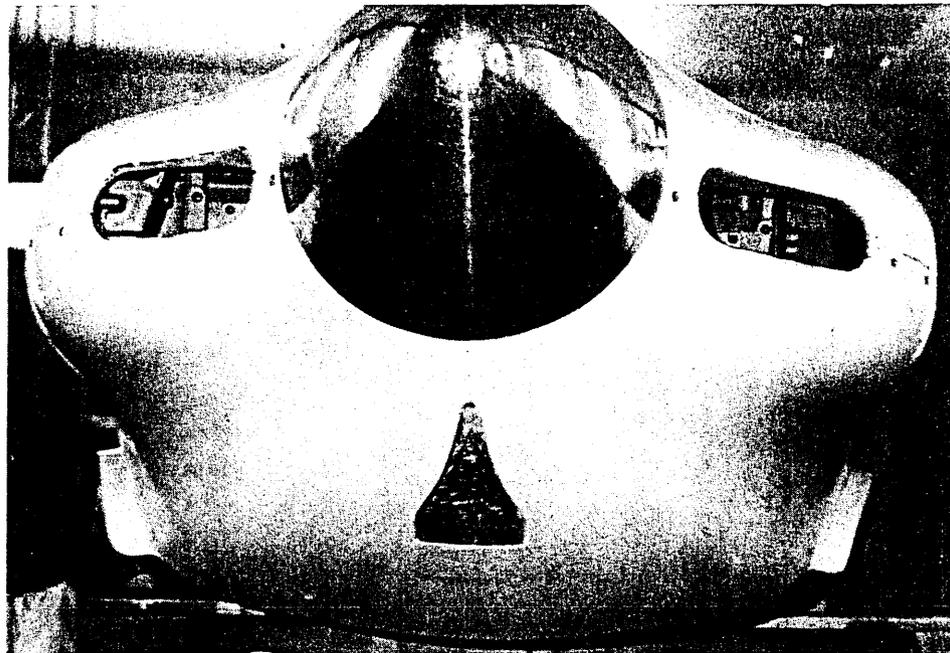
Drawing #2 gives the top lengths and various size pieces of the 3 densities used in the seat, and the layout is shown on drawing #1. The lower half of drawing #2 gives details of the 3 - 1" layers of the most foam - green pad which can be kept separate under the total 3 layers - 48" seat for the shorter





## SUBARU COWLING

Reg & Bud Clarke are brothers that have been working on the turbo-Subaru application over that couple of years. Reg lives in Alberta, Canada and Bud lives in Helena, Montana. Reg's Turbo Subaru Dragonfly is flying and they have been using that for the engine/turbo testing. Bud's Dragonfly is still under construction and they have used that to do the design work for the new cowl. The composite work is Bud's area of expertise as you can see by these photo's of the new cowl.



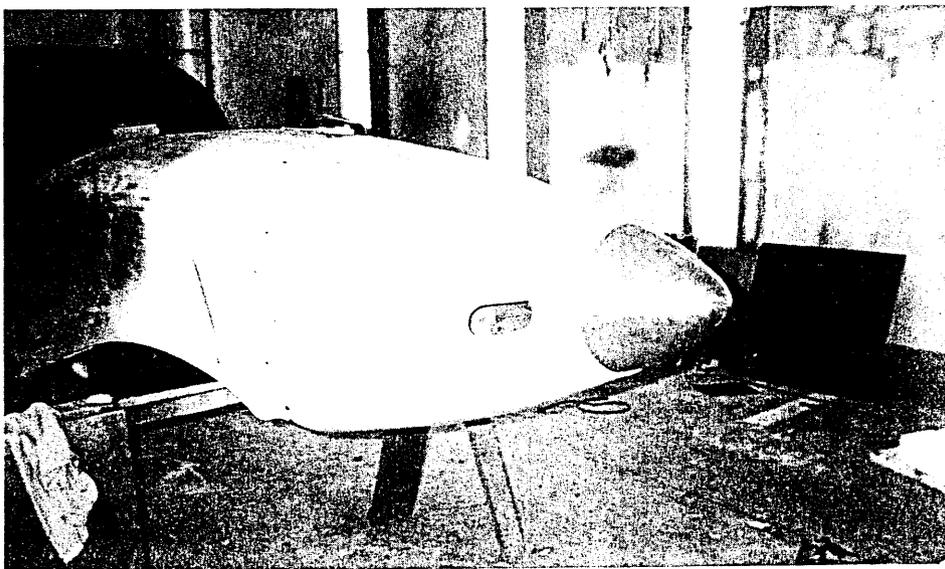
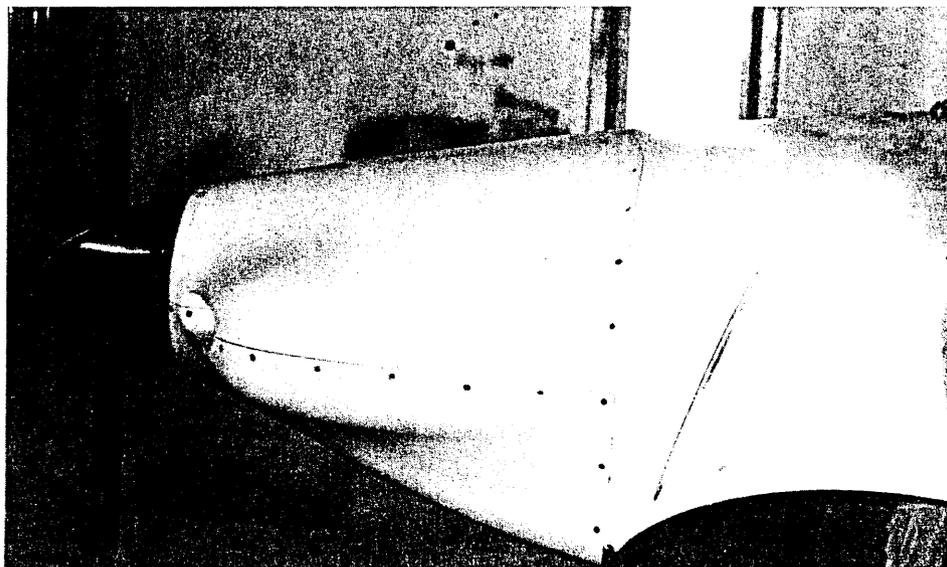
Now Bud's update!

Hi Spud, here's a update on our new Subaru/Dragonfly that we have available. It will fit the EA-81 or the EA-82 with a prop extension or reduction. It would also work with a VW engine as well with a 4 1/2 to 5" prop extension if acceptable by the engine manufacturer. The cowling incorporates a "Shark gill" type cooling air exit.

Included with the cowling package is a top & bottom, side cheeks hot air outlets, input air inlets & flanges molded on all parts, so all that has to be done is install nut plates, trim, prime & paint. The flanges are made 3/16 thick so you can eliminate the flat washers on the outside of the cowl. Just use 10/32 countersunk machine screws. The main cowl halves are made with 3 plies of 10oz. BID, very light but very strong.

These cowling packages are available for \$575.00.

Contact; Reg Clarke  
c/o Clarke Upholstery,  
Box 6896,  
Wetaskiwin, Alberta, Canada  
T9A 2G5  
(403) 352-5001



## LETTERS, LETTERS !

To follow is a letter that was published in the Jan/Feb issue of Q-TALK, the Quickie Builders Association newsletter published by Jim Masal. Jimmie felt this deserved a much wider exposure. As usual he's absolutely right again! Please read & digest it, couldn't be more accurate of a observation - Spud.

### NOTES FROM THE EDGE

#### **A Commentary On the Joys Of Airplane Building**

So, you're interested in building an airplane and you're either held over heels in love with a design or just searching through the trade magazines with hopeful eyes and not much of a bank account. I know where you are looking to go, but I'd like to discuss the darker side, the things some us miss in our call to glory. I'll tell you what the slick magazines won't.

The reason I'm writing all this is because I'm in the middle of another of the panic attacks that I have been having for the last three weeks. It occurs every time I even think of what it's going to take to pull through the last odds and ends to get my plane (Q-200) to the airport and make the monster fly. The night before last my wife gently tried to massage the tension out of my upper body as I was so tight that I was beginning to cramp. You think maybe it's just the job stress coupled with an intense desire to finish? Maybe early mid-life crisis? Maybe that's it's, but I can't be sure.

Other builders will tell you about being 95% completed and having another 95% to go to finish an airplane. Others (generally &\*\$%# system engineers) will describe 80/20 relationships of doing 80% of the work in the remaining 20% of an effort. I don't really believe I'm overloaded in this manner, I just feel tired. There is a common saying in homebuilder circles that there is a finite amount of effort that a builder will put into a project, after that he will finish it, one way or another. I'm there now, guys. I can't truly say that I have hated the process, but it's had it's moments and I'm still not done. I must also mention that I will probably continue to build these things until I'm dead cause I'm an obsessive/compulsive guy when it comes to this.

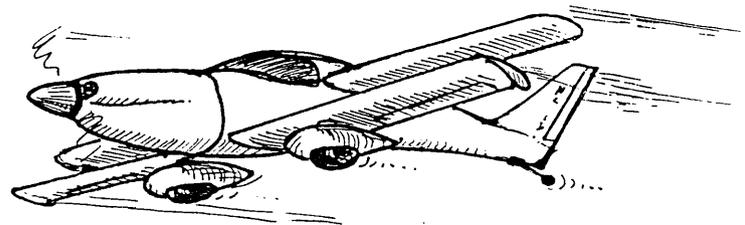
So what does the dark side look like? It looks like buying a kit out of production for 4 years and having to scrounge for parts which no longer exist. It is finishing a major prefabricated assembly and realizing with your "engineering" mind that you would have had a better part if you had done it from scratch. It is the never ending labor of composite finish spline sanding in a summertime 105 degree F garage wearing a respirator,

with sweat streaking through a face colored white with dust of cured micro slurry. It's investing in lasers and electronic angle finders to achieve accuracy's other somehow find with a simple plumb bob. It's also the frustration of implementing all the "nice to haves" and "warm fuzzies" that your non-builder buddies can think up and realizing years later that you really didn't need any of it. You have been adding dead weight and expense to your plane that could have been had with a handheld. Then, it is the horror of watching your 7 years of work packed up on a trailer for a long slow precarious trip to the airport and seeing the restraints come lose on a bump less than a mile from the destination. The dark side is spending more time building the plane than you spend with your family. You have had no weekends off and no vacations, because even though you were physically elsewhere, your mind was still on the project. I am also sick of answering meaningless questions: No, Burt didn't design my airplane, it's not a canard it's a biplane with no horizontal, and you can't go out and buy one for so much money. And even more: No I don't know when it will be done or when I fly it because I'm not even sure it will fly. AND FINALLY: Use of composites or aluminum in a design is all a tradeoff. The stuff you really want to build your planes out of is called "unobtainium." Now, you show me the Kitplanes ad or article that says all this! Don't get me wrong. I'm not down on the movement, I'm just warning you.

Is there any good in all of this? I'm not sure, but maybe the look on your four-year old's face when he asks you what you are working on or maybe the opened mouthed awe of your ten-year old when he sees your engine for the first time. Maybe that's it. I'm not sure. I do know that it is much easier to see how I will design the next one. This is stuff that the Aerospace Engineering curriculum did not reach. I've also learned another thing for sure. And that is, if you area first time builder, build it simple and cheap. You guys out there who turn up your noses at Tailwinds, Sonerias, and anything without a electrical system have never built an airplane. The guys who build simple airplanes will fly cheaper and more often with less to fix than the guys who spend a megabuck for the latest and the greatest. Airplanes are tradeoffs in performance, time and lifestyle. think about it!

Brian Martinez

Q200 Builder



# PHOENIX DF PICNIC

A short report the Phoenix Dragonflyers 3rd Annual Cook Out - Fly-in. It happened on a beautiful Saturday/Sunday of February 26th & 27th at Deer Valley (north of Phoenix) airport, and 7 Dragonfly swarmed around a crowd of 30. Refreshments, hot dogs and hamburgers with all the condiments prepared for the visitors and home town crowd.

We had invited all the DBFN subscribers in the southwest, and were pleased that locals Larry Brown and Bob Roe had their Dragonflys, plus Justin Mace up from Tucson, Len Griffin and his instructor Bill McLearn rolled in from Silver City, New Mexico via Tucson. First to arrive on Friday were Jack Shafer and his dad, along with Guy and Gene Evans from California. Nate Rambo and Margy drove over from Camarillo, CA. for the Saturday festivities. It was good to see all the old friends and make new acquaintances. For all of us who are not in the air in our own DF's, it was great getting a ride with some experts early bird fast builders! We thank all the gals who prepared all the food.

People attending with aircraft were as follows;

Matt Gunsch - Mark III (Tri-gear)

Justin Mace - Mark II Subaru

Bob Roe - Mark II

Larry Brown - Mark II

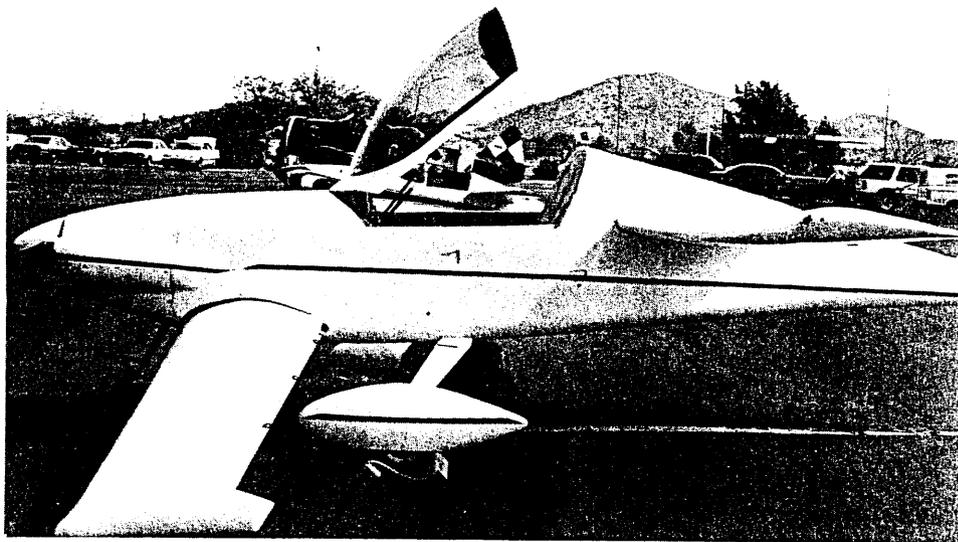
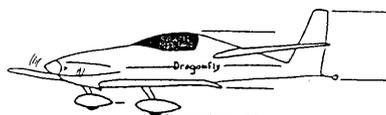
Len Griffin - Mark I

Gene & Guy Evans - Mark II

Jack Shafer - Mark II

Bob Boydston

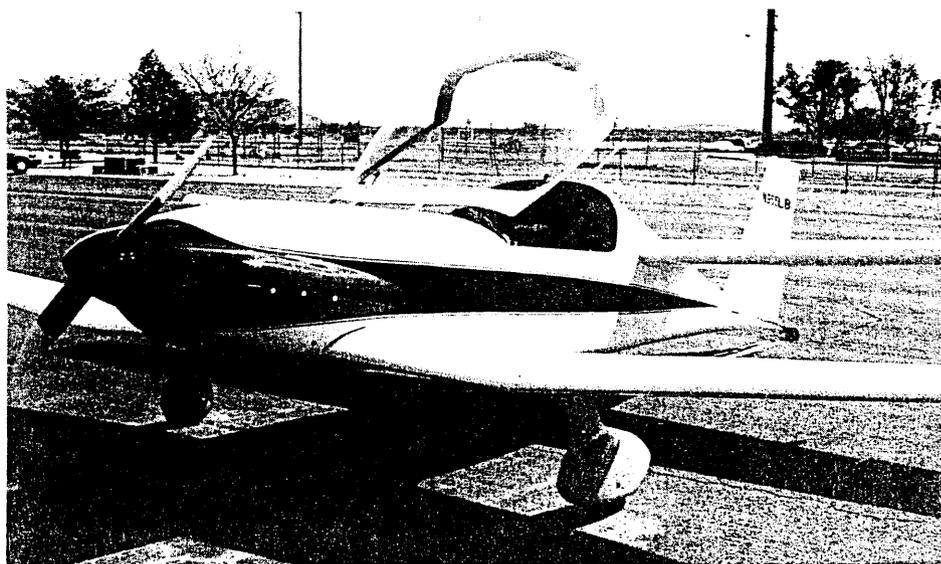
Sedona, AZ



**MATT GUNSCH'S - MARK III TRI-GEAR**



**BOB ROE'S - MARK II**



**LARRY BROWN'S - MARK II**

## THE CLASSIFIED'S

**Free Jigs:** I have the forward and rear turtledeck jig/molds who ever wants to pick them up - free. I got them from Paul Zimmerman on the condition that I would would pass them. David Morris - Garland, Texas (Dallas/Ft Worth area) (214)414 3717

**For Sale:** Mark II Dragonfly project-fuselage, wing, canard and fin complete(no fill). Includes cowling, canopy and other material to finish including most metal parts. \$2500.00 OBO. Will consider parting out. Also have all parts to build VW engine Hapi 60-2DM 1835cc (no carb) \$1900.00 OBO Doug (206) 638-25994

**For Sale:** Sterba 60X68 prop \$250.00, spin-on oil filter adapter for continental \$125.00, two new Lamb 11:00X400 tires \$50.00 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

**For Sale:** Mark I Dragonfly 240 hrs., plans built less canard & engine. \$4500.00 Call Kenny for spec's-(402)593-9492 after 6:00 PM CST

**For Sale:** Dragonfly plans/newsletters and all three Hapi construction videos, all never used. Also looking for an unused set of CYGNET plans which Hapi once sold. Tim (403) 594-5675 POB 3114, Medley, Alberta, Canada T0A 2M0

**For Sale:** Rotax 503, 2.24:1 gearbox, Dual CDI ignition, Run great. Jon (406)443-7311

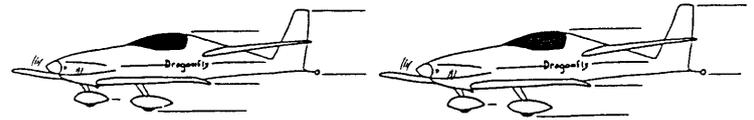
**For Sale:** Dragonfly project, fuselage started, most other materials to finish airframe and an used VW engine. Make offer Charles Cagle (404)382-5656

**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:** Original Mark I Dragonfly, no canard or prop, Hapi 60-2DM engine. Flight instruments, Whelen strobes, unwrapped "bow" style gear leg. \$5800.00 Paul Dickson (606) 654-83984

**For Sale:** New propeller for VW Diameter 48" x 45" pitch, center recess 2" diameter, 4" inch bolt circle, laminated Birch, fiberglass ends, urethane finish. \$220.00 money back guarantee, Joe (303) 936-1683

**For Sale:** Dragonfly 35hrs TT, time not flown off. New style bow gear legs no wheel pants, wheels, tires and brakes off Tomahawk, 1835cc VW w/ Monnett conv. access and Rajay turbo, Escort 110 radio, strobes and running lites. \$8000.00 Warren Yeley (405)586 1753



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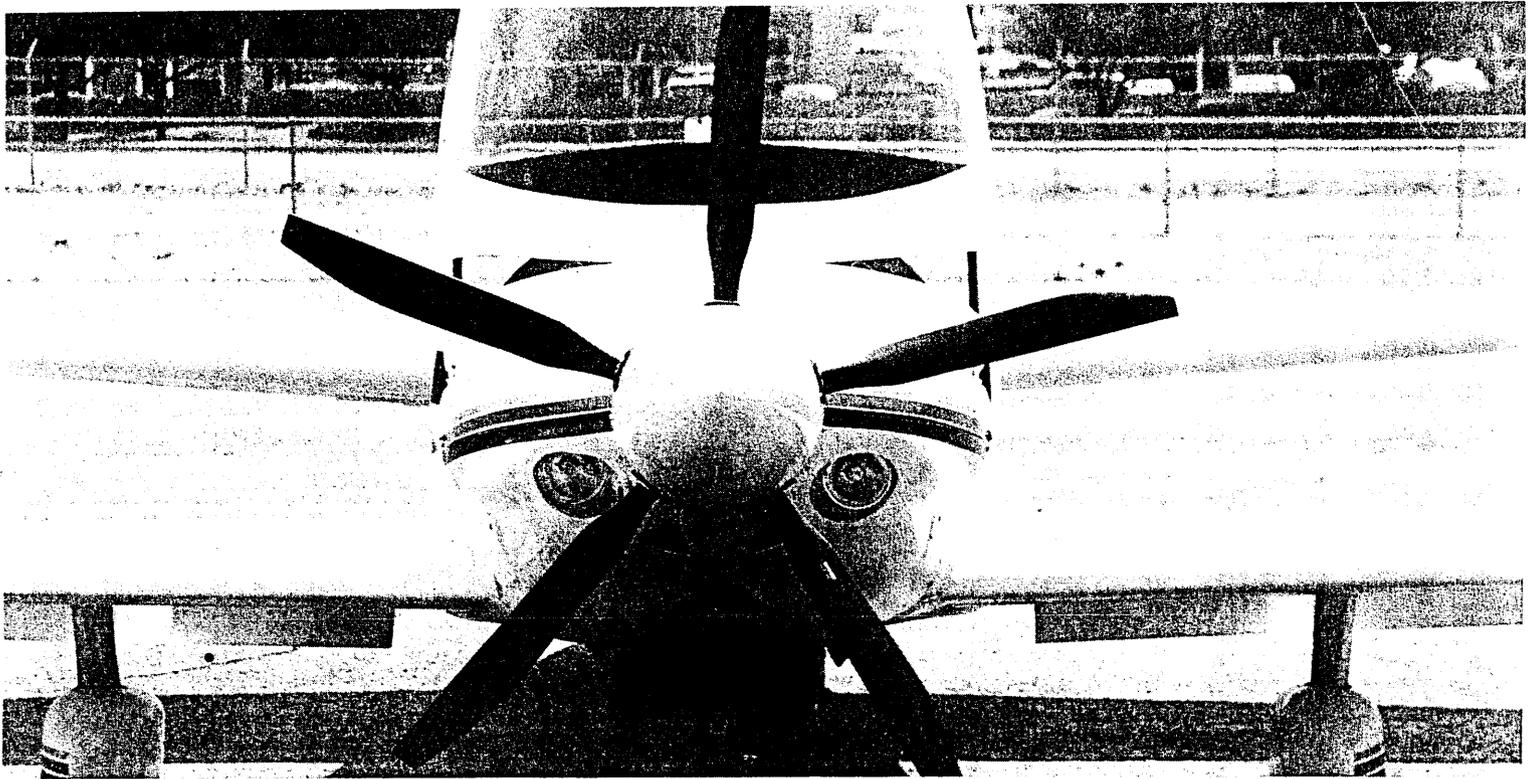
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