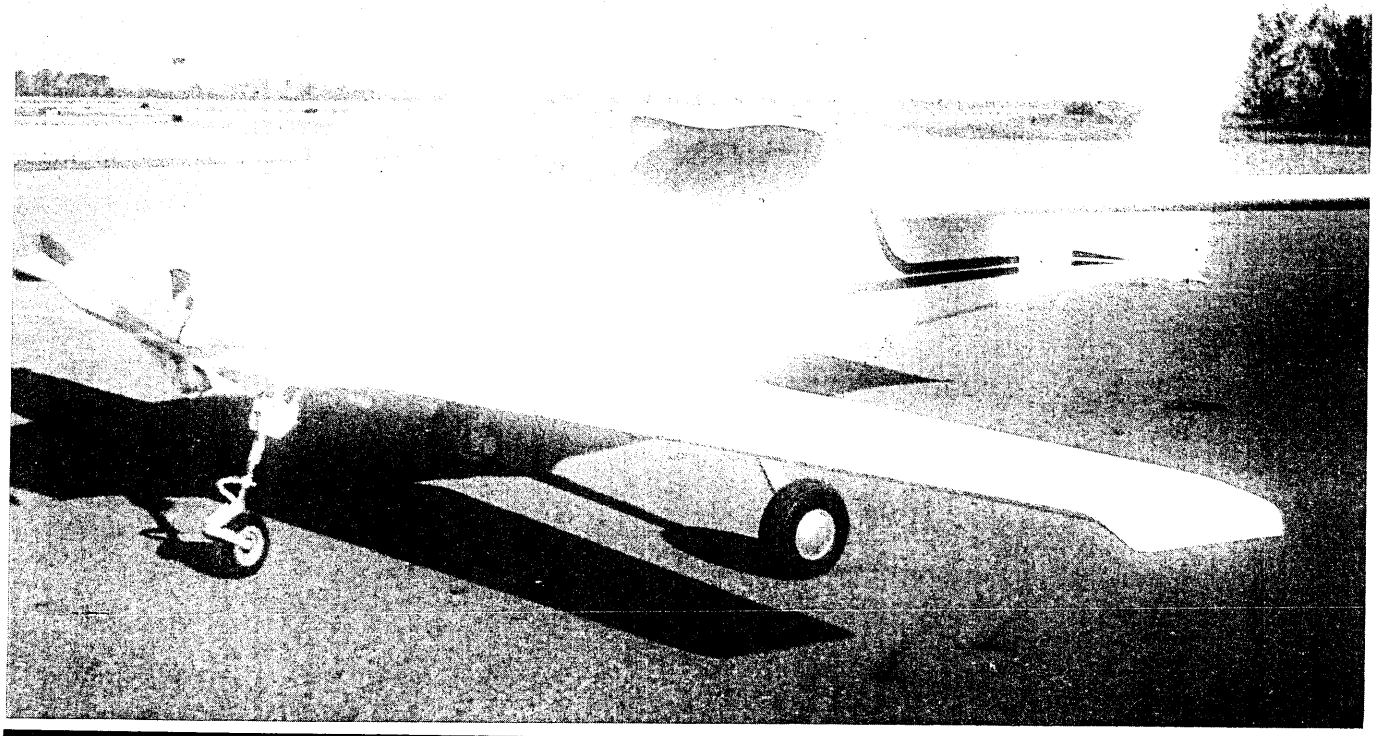
DRAGONFLY BUILDERS AND FLYERS NEWSLETTER

THE OFFICAL VOICE OF DRAGONFLYERS ALL OVER THE WORLD

VOLUME 50 *NOVEMBER - DECEMBER 1993*



DAVE BASTION OF FLUSHING, MI. MAKES THE FIRST FLIGHT IN HIS NEW TRI-GEAR

Hi Spud

Well it finally happened! After 7 years. & 400C plus hrs my Tri-fly made her first voyage into the wild blue yonder!

The flight was without major incident, other than a slightly heavy right wing, which I easily fixed by readjusting the elevators. Flies hands off now.

I just wanted to tell you & all my Dragonfly friends that I am not a taildragger pilot. I gave it a honest try but I was trained in Cessna 150's and old tri-gear habits are hard to break. I had my Dragonfly all finished as a Mark II and at the last minute changed it over to the tri-gear

and I'm in love! It was a tough job changing it over but I'm totally satisfied with the outcome. I remember the day I called you about changing from a taildragger to the tri-gear you said that the change-over time would be about 80 hours, well how about 250 hours plus all the running around the country side trying to make thing happen. I started out with a piece of aluminum 8"wide, 8'long and 5/8"thick and a BD-5 nose gear. Well to make a long story short it turned out just great and it was worth every long hour spent.

I have now flown it 3 times for about a hour each and waiting for mother nature to smile on me so I can get the forty hours flown off.

After I get the forty hours flown off I'll write again and tell you about some of the things I did in building her.

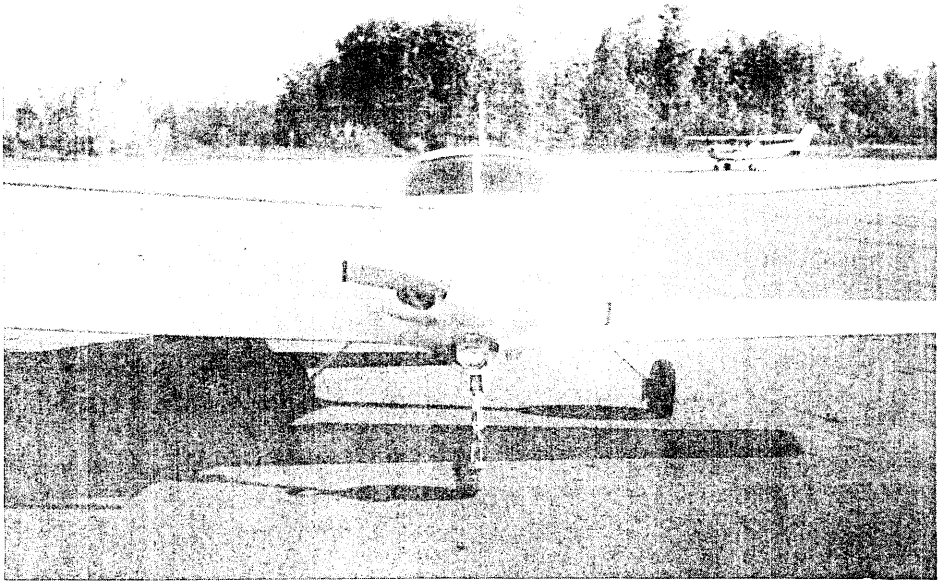
Dave Bastion

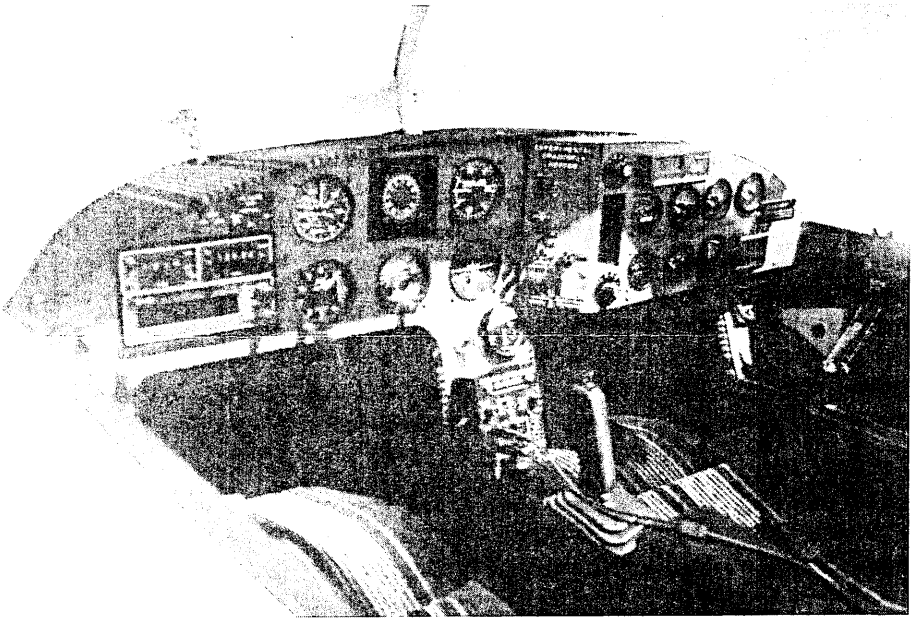
7201 Northfield Circle

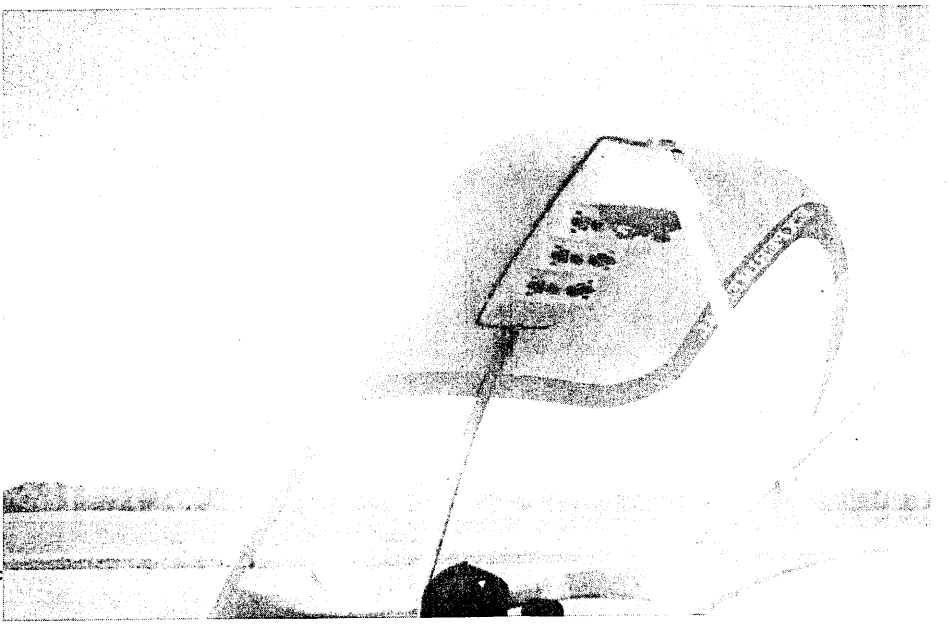
Flushing, MI 48433

(313)659-7228

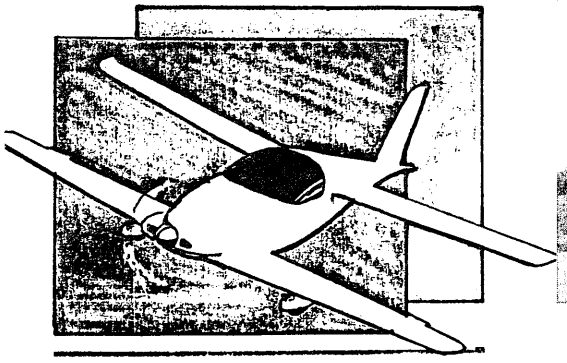
In the pictures to the right you'll notice a couple of neat things, Dave did different on his Dragonfly. He has a partial cover over his canopy incorparating a electrical console and interior lighting. Also you'll notice he has built out from his header tank area for additional instrumentation which also gave him some addtional area for contol swiches and etc.(notice the angled area just right of the turn & bank). - Spud







DRAGONFLY



STILL MORE ON GAP SEALS

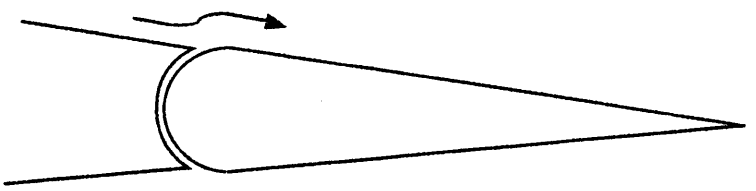
Hi Spud,

In DBFN #48, page 5, I read with great interest the letter from Peter Judd (MORE GOOD NEWS ABOUT GAP SEALS), Telling of his experience using Reg Clarke's gap seal method from newsletter #43.

For years I've wondered about the significant range of differences in canard pitch change involving rain or surface contamination. Besides the many discussions about it in the various magazines over the years, I can remember reading about a study that Burt Rutan did a few years ago that didn't really come up with a definitive answer.

Obviously, no two canards are going to be the same because of variations that "moldless" construction creates from aircraft to aircraft. (not to mention the differences between the left and right halves of any canard!). It just didn't dawn on me to think of the elevator hinge gap as a major source of variation in airfoil efficiency. I seem to remember that on the prototype Dragonfly, the elevators were very snug. It would be interesting to see if the Dragonflys with the greatest amount of pitch change in the rain have slightly larger elevator gaps than average.

I'll include some related information from a 1984 issue of Soaring, but first I'd like to mention something remembered from an article that I possibly saw in Sport Aviation back in the 1970's. This was a discussion of control surface design on the P-51 Mustang. Control surfaces are similar to the Dragonfly, except that on the P-51, the control surface cross section was slightly larger than the trailing edge of the wing. The theory here was that as the laminar flow departs the trailing edge of the wing, it is forced to flow up and over the larger elevator surface (Drawing below), causing it to maintain laminar flow for a longer period of time. (This might also tend to reduce the airflow into the gap, but unless I manage to find this article again, I'm stuck for any more info the article might have contained.) I was tempted to build enlarged control surfaces when I was preparing to hot wire, but I chickened out.



The most subtle sleuths of drag are the glider boys, who have pursued this quest for decades. I recently ran across one of the many articles that I've saved over the years as a reference for the Dragonfly project. In the May, 1984 issue of SOARING, there are two articles relative to laminar drag reduction. One is "Maintenance & Projects" on page 41 which describes methods for reducing control gap leakage. The second article, on page 20 is "Drag Awareness", from which I am including pertinent excerpts. "-- **Interference Drag** - In addition to interactions between wing, body and tails, movable control surfaces, spoilers, and air vent systems also cause drag. Some of these interferences are inherent in the design and some may be affected by the pilot. Control surface and flap gaps may create interference drag which can be reduced by sealing. Some sample data are provided in Figure 5 to give an idea of the importance of these sources to sailplane drag."

(from Fig. 5)

Control Surface Gaps Cause Drag

100 mph (87kts.)

Unsealed Spanwise Gaps	
Rudder & elevator	0.3 lbs.
Ailerons	1.0 lbs.
Sealed Spanwise Gaps	
with Seal depressors	
Rudder & elevators	0.1 lbs.
Ailerons	0.5 lbs.
Unsealed Cordwise gaps	
Ailerons	0.1 lbs.
Ailerons & flaps	0.3 lbs.

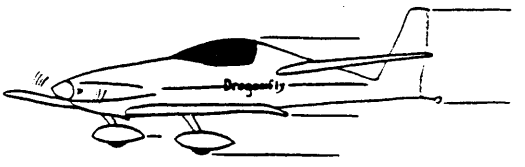
Total Drag, All gaps unsealed - 1.6 lbs.

Total Drag, Spanwise Gaps sealed - 0.70-0.8 lbs.

Please understand that these drag figures essentially refer to factory built glass sailplanes that probably come with fairly consistent and reasonably close-fitting control gaps. Of course, neither are they outfitted with full-span elevators, as is the Dragonfly. I would think that unsealed drag figures based on a Dragonfly would be appreciably more than a typical sailplane - I'd guess 50 to 100% more - at 100 mph! You can easily guess that the figures jump appreciably at say, 160 mph. The real numbers would depend a great deal on a specific aircraft's trueness to airfoil contour and existing surface roughness.

If anyone would like complete Xerox copies of the two above mentioned articles, just send me a SASE (legal size).

Buck Buchanan
20925 Woodside Way
Groveland, CA 95321



COPPERSTATE

Hi Spud

The west coast has had a lot of good flying weather this fall. Jack Shafer had installed his new motor and we decided it was time to venture out. We attended the Copperstate fly-in in Glendale, Arizona on the first weekend of October. We left Friday morning for a comfortable three hour+ 500 mile trip. About half way there we joined up with Nate Rambo and after landing in Blythe for lunch our flight of three vectored our way through the Luke AFB control area and landed at Glendale.

The Copperstate Fly-in is like a mini Oshkosh with lots of homebuilts, Ultra lights, and many seminars on AC related items.

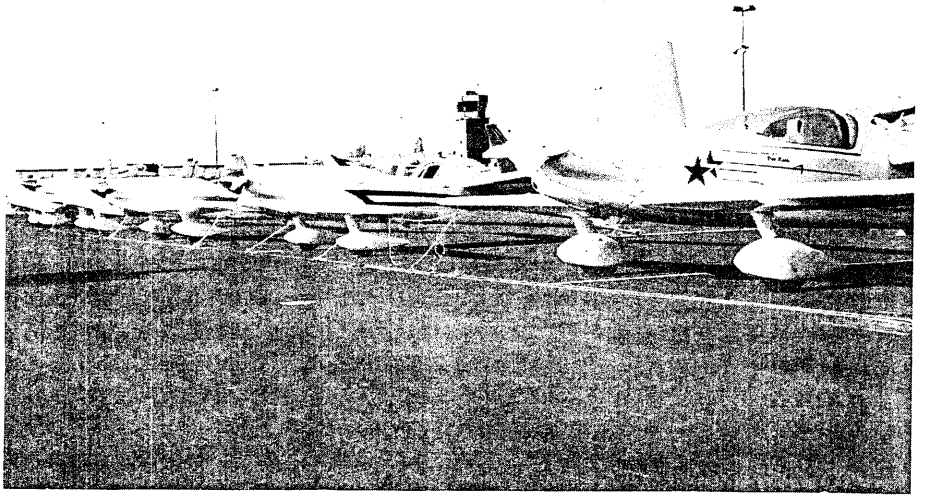
When we arrived Larry Brown with his Gull winged DF from Arizona was already there, Two additional DF's from California arrived later on that evening which gave a total of 6 Dragonflys, all Mark II's. The people that attended Copper State in their DF's where Larry Brown, Nate Rambo, Jack Shafer, Bob O'Connell, Ken Hallbauer and myself Gene Evans. After a spaghetti dinner the DF crew retired to our motel lobby for a mini DF conference, which was interrupted by an armed robbery, talk about the wild west.

Saturday was spent attending seminars and a lot of hangar flying. We had hoped more of the Arizona crew would of showed up and given us a flying tour around the Copper State.

We departed Early Sunday morning for home with a stop over in Apple Valley for Lunch.

Gene Evans

Visalia, CA



Above, left to right - Ken Hallbauer, Jack Shafer, Gene Evans, Bob O'Connell, Nate Rambo

Bob O'Connell's Fuel System

Hi Spud,

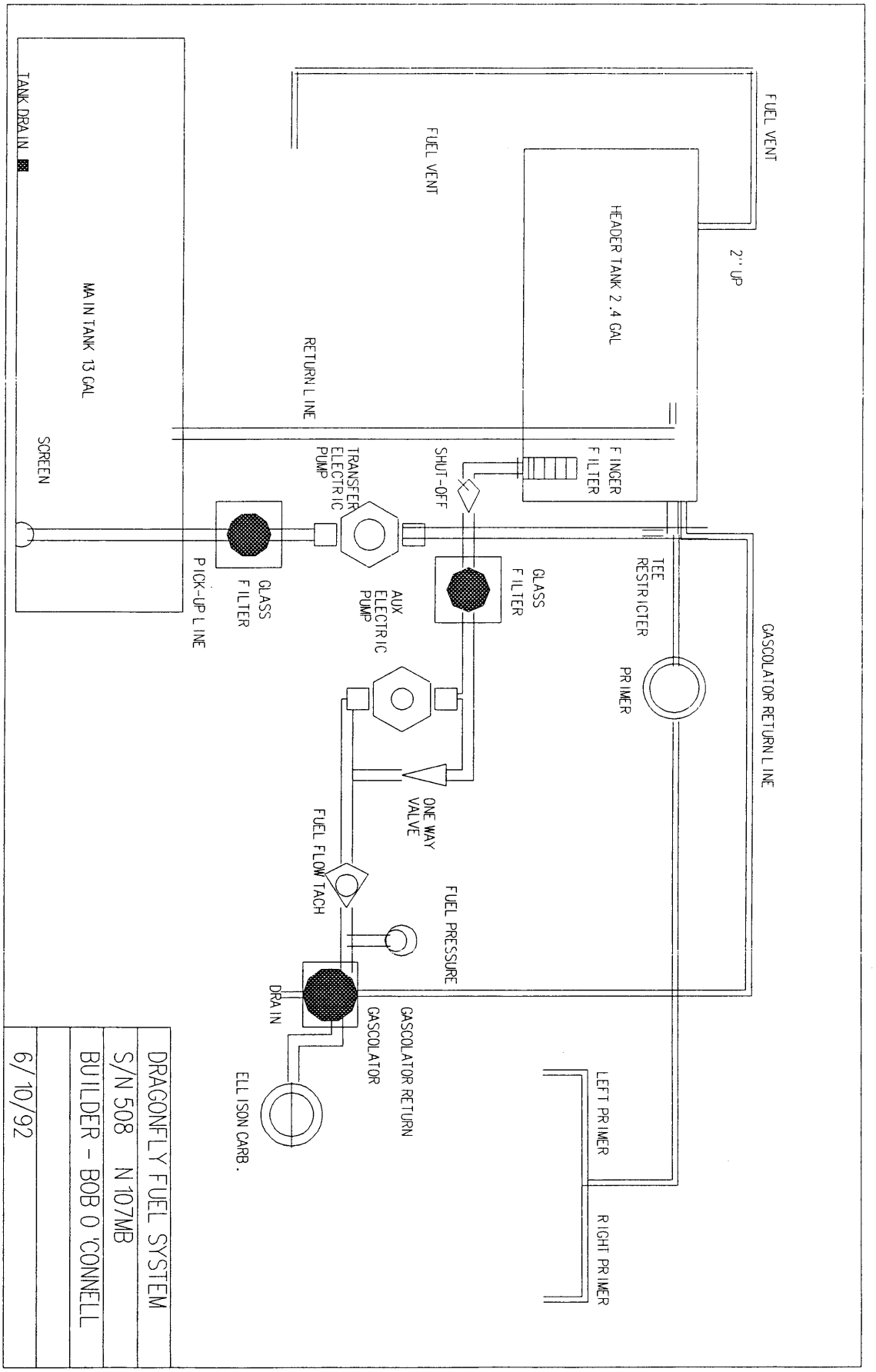
Find enclosed (on next page) a drawing of my fuel system that I used on my Dragonfly N107MB, which is very similar to Troy Burris and Jerry Scott's.

The drawings should be self explanitory. It gives back-up and is very simple.

Bob O'Connell

DRAGONFLY BUILDERS & FLYERS NEWSLETTER

Bob O'Connell's Fuel System



LETTERS, LETTERS

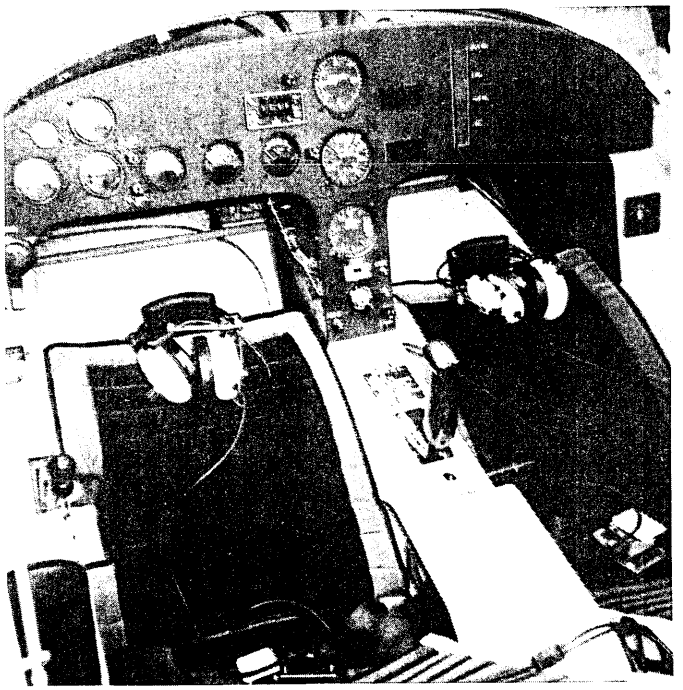
Hi Spud,

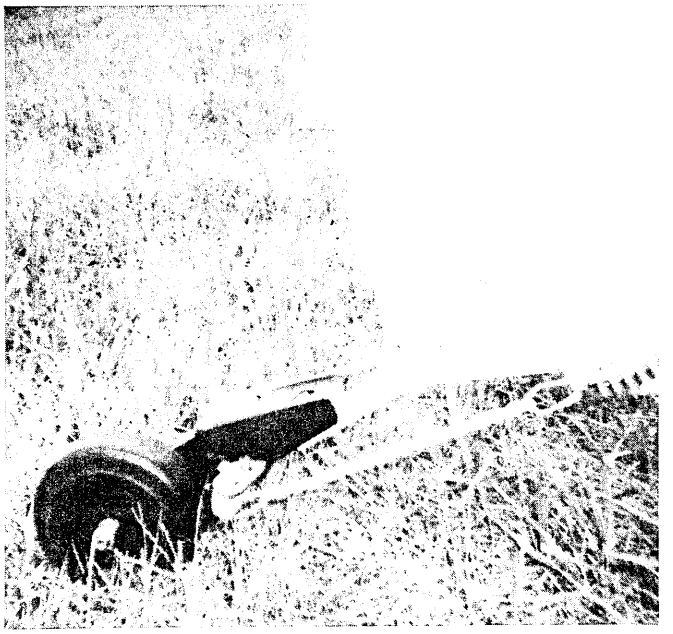
I think the last time we talked was when I had the engine failure and didn't make the runway! Here is a little advice about using reworked motorcycle junk in you fuel system, DON"T!!!!

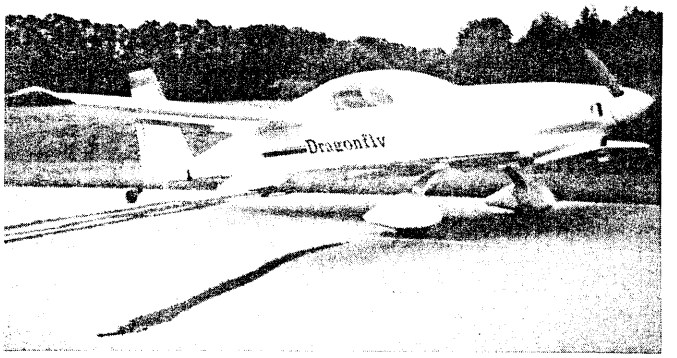
I appreciated the little pep talk on the phone when I told you that I was going to sell My Dragonfly (this was right after the incident when he got home from the airport-Spud).I'm really glad I listened to you and didn't sell. It's back in the air and flying just fine, with a new Ellison. They are expensive but worth every penny.

While going over everything after my off-airport adventure, I found a crack in the tailspring. I repaired it by sawing off the old one and flattening the bottom of the tail and laying up some Kevlar where I removed the old fiberglass. I made a new flat spring with "E" glass in a wooden mold similar to the way we make the new style bow gear. I also installed a new Matco steerable tail wheel and it works great. The spring is now bolted to the plane. Now if it crack you can just bolt on a new one.

I've got 5" Cleveland wheels and brakes on the bow gear and I made my own wheel pants. While I was making the repairs I also took time to install a electric primer, reflex system and made the hatch over the wing. I have about 100 hrs. on it now and about 15 hrs on all the new and everything is working excellent.







Concerning the Newsletter, It is the lifeblood of the Dragonfly community and you do an excellent job! And I love the T-shirts!

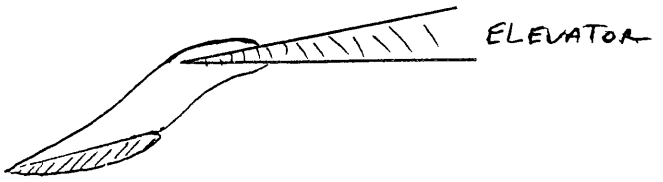
Robert Miller

Wellsville, Ohio

From Down Under!

Geday Mate! There must be the same rain drops down under as there is in the USA. Because our Dragonfly's do exactly the same as yours when flown through them - slight nose down pitch moment with stall speed raised to about 75 KIAS I discovered this on my Dragonfly (VH-NDF) while doing circuits in and out of my home airport. There was this one cloud raining in a spot about halfway down "downwind" which I had to fly through. My D/fly pitched down with no big deal as a bit of back stick compensated for it OK, it wasn't until final as I let the speed slip down below 75 KIAS that the canard started to stall. Rob Kermanj's Vortex generators look pretty good to me, knowing my luck I will fit the VG's

and find the vortex's turn the wrong way here, down under! I got sick of loosing sparrow strainers out in the back locks of Australia because the bloody damm things never stuck to the elevator surface so I made them so they would stay on by putting a "V" shape in the side brackets which give more gripping area to the elevators and that has eliminated that problem. Sketch below.



Being a Mark 1, I have had a lot of fun learning to land the D/fly without bending it. Once I got it down without a bounce, all was simple from that point on "Wrong!" I had landed (without a bounce) at our version of "Oshkosh" called "Mangalor Air Show". All eyes were on me as I slowed to a point where the tail was just coming down. I looked across to see where I was going to squeeze into between the aircraft parked. When I looked back down the runway, instead of seeing blacktop out front the nose of my D/fly was pointed skyward and at a 30 degree roll. One wheel was 10ft up while the other was just leaving the ground. A quick glance at the airspeed showed it dropping below 40 kts. OH SH-T! What followed was a bounce that almost went into orbit. This had a demolishing effect on the prop and my reputation as a pilot. The post script to this story is that at the next maintenance check the top skin of the canard had delaminated from the foam in the center section, this was a major repair!!

Over temperature of my engine (Hapi 60 hp) is also a problem we have down under - The C.A.A> (our FAA) requires us to meet a climb gradient of 8% which at M.T.W. is a climb at 65 kts we must go up at 660 fpm. Big deal you say! well just go out and try it on 60 hp! 65 kts at max takeoff weight and sustain over 660ft per minute to 5000 feet. We can just barely do it - just, but the engine gets hot - thus cooling drag & outlet size of cowling have to be looked at. Most of us have gone to 2100cc engines (except me) and Len Dyson also went to a Hoffman flight adjustable prop.

Keep up the good work on the newsletter. All of us down hear who can't get to your airshows to see all the great ideas on everyone D'flys rely on the newsletter for this information. All for now.

Dave Howse - Dfly VH-NDF

2 Florence Street

Lara Lake, Victoria

Australia 3212

MULTICOM

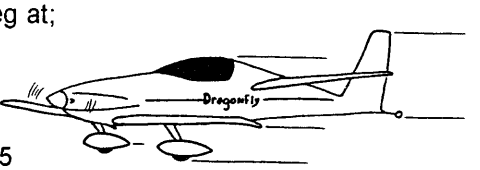
• Need a Direct-Drive Turbo'd Suby?

Reg Clarke of Wetaskiwin, Alberta has been flooded with requests for additional information on his Direct-Drive Turbocharged 1.8 Subaru. Reg has over a hundred hours on this combination, he's made several inspections to the engine and system to check for wear, signs of fatigue and so on, everything looks excellent. Reg is getting ready to do several engines for other people, of course they'll be turbocharged, remanufactured to zero time tolerances, balanced and set up with his special systems to control the turbocharging.

• Also Dragonfly Canopy covers & interiors

Reg has also sold quite a few canopy covers and a Dragonfly interior like in his DF. The price for the fuselage/canopy cover is $180.00. The price for a full interior starting at $995.00 (see Reg's interior in DBFN #49, page 4).

Those interested in the Turbo Subaru, canopy cover or interiors may contact Reg at;



Clarke Upholstery

Box 6896 Wetaskiwin,

Alberta Canada T9A 2G5

Phone/FAX (403) 352-5001

• Geo 3 Cylinder

Hi Spud

Just a short note about my Dargonfly. Last fall I lost the engine inflight, was able to land without any trouble, the engine was a Hapi 1835 with less than 90 hours (Hey Gary, we need to know exactly what the failure was, please!). Since then I have change the landing gear to the fuselage mounted and now working on changing engines! I'm using a Geo 3 cylinder with a Dave Johnson Reduction (1.84 to 1.00) conversion and everything is going well! I will write with more details and pictures when I finish the installation.

Gary Sheets

Indianapolis, Indiana (317) 862-2617

BUILDER'S TIP'S

Hey Spud! Here are some sketches and photo's on an alternate method of installing the control stick hardware for the ailerons. The advantage of this change is the ability to install all of the hardware while the armrest is on the work bench. It allows easy alignment of both the forward bearings and the intermediate bearings. The nice part about this is that you won't have to stand on your head to install the intermediate bearing behind the seat back. I have completed installation of the forward and intermediate bearings, as well as the assembky of the aileron torque tubes and the aileron crossover bell cranks. This change enabled me to assure proper alignment of the cross-over bell crank by placing the armrest side by side and matching the place-ment of the crossover beli cranks prior to drilling, and it also seems to have simplified the assembly.

Note: 1. The CS14 intermediate bear-ing is not used in the center armreast, two CS13 forward bearings are used.

2. For the right armrest the intermedi-ate bearing needs to be fabricated as shown in the sketch for the new CS14.

I am also adding a control stick, on the left hand arm rest, to allow the pilot to fly left or right handed. with the present configuration the pilot is tied to always flying the plane with his right hand, this would free up the pilots writing hand for working on flight plans and charts (that is if he or her is not a south paw).

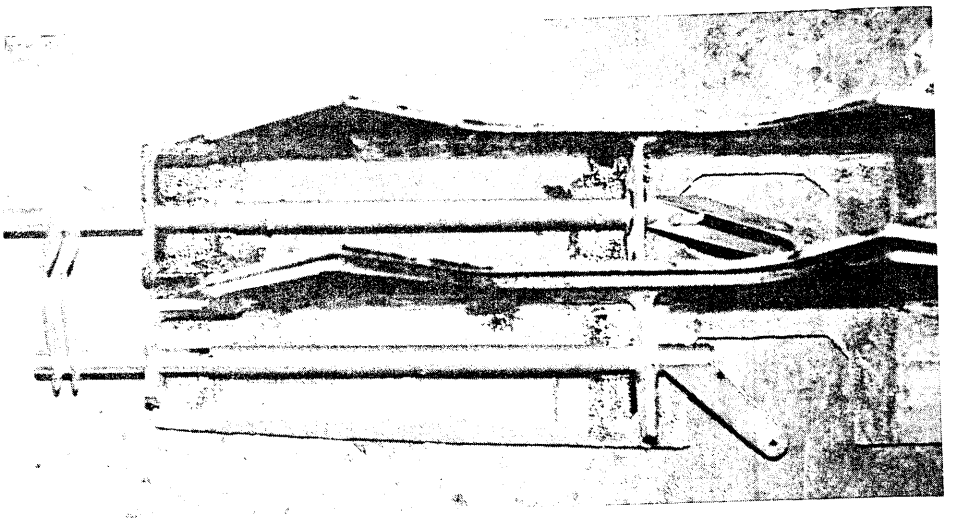
Also you'll find a sketch on how to build a scoring saw for scoring the turtle back foam to allow bending of the Clark foam.

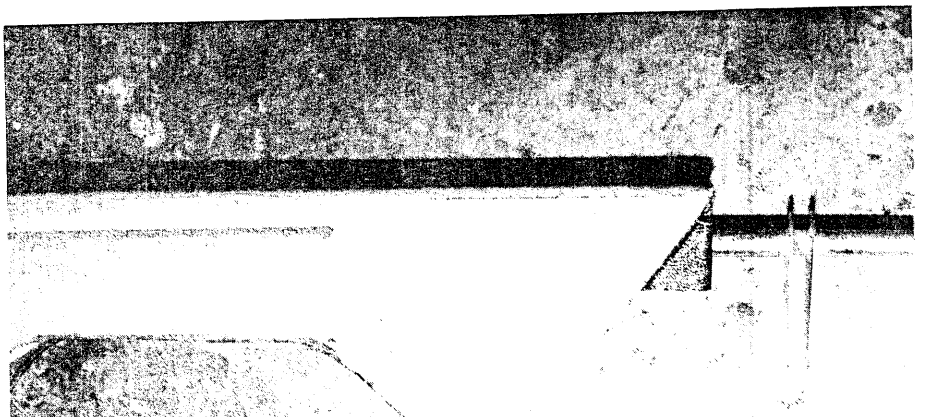
Regards

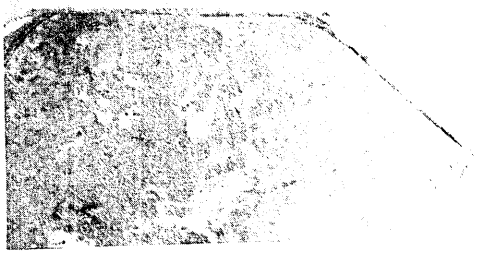
Paul (Z-Mann) Zimmerman

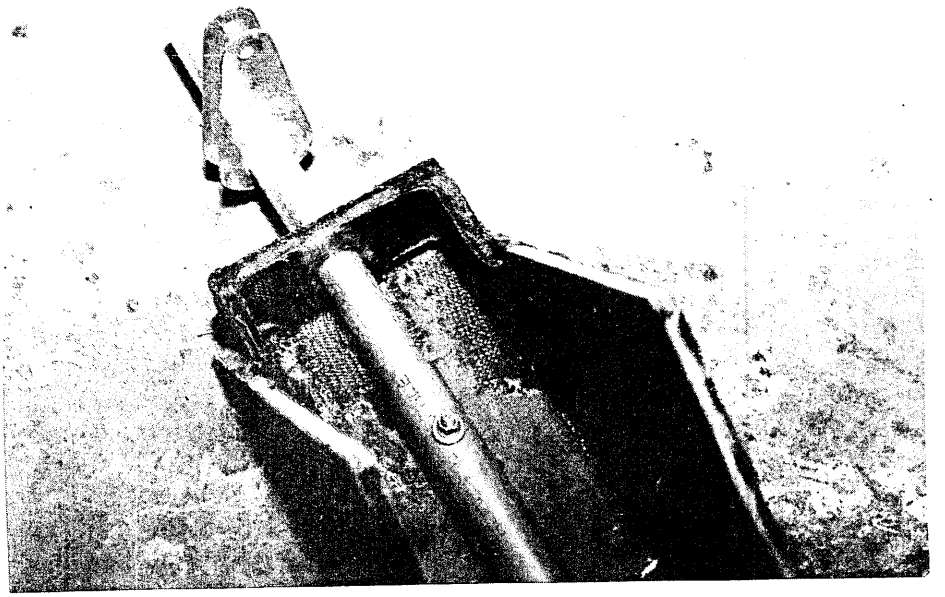
4802 Vera Cruz Drive

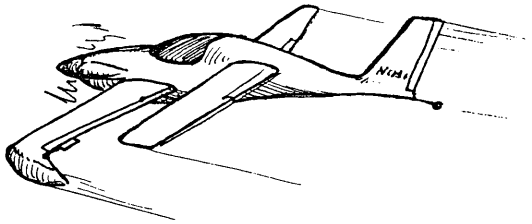
Garland, Texas 75043-3130



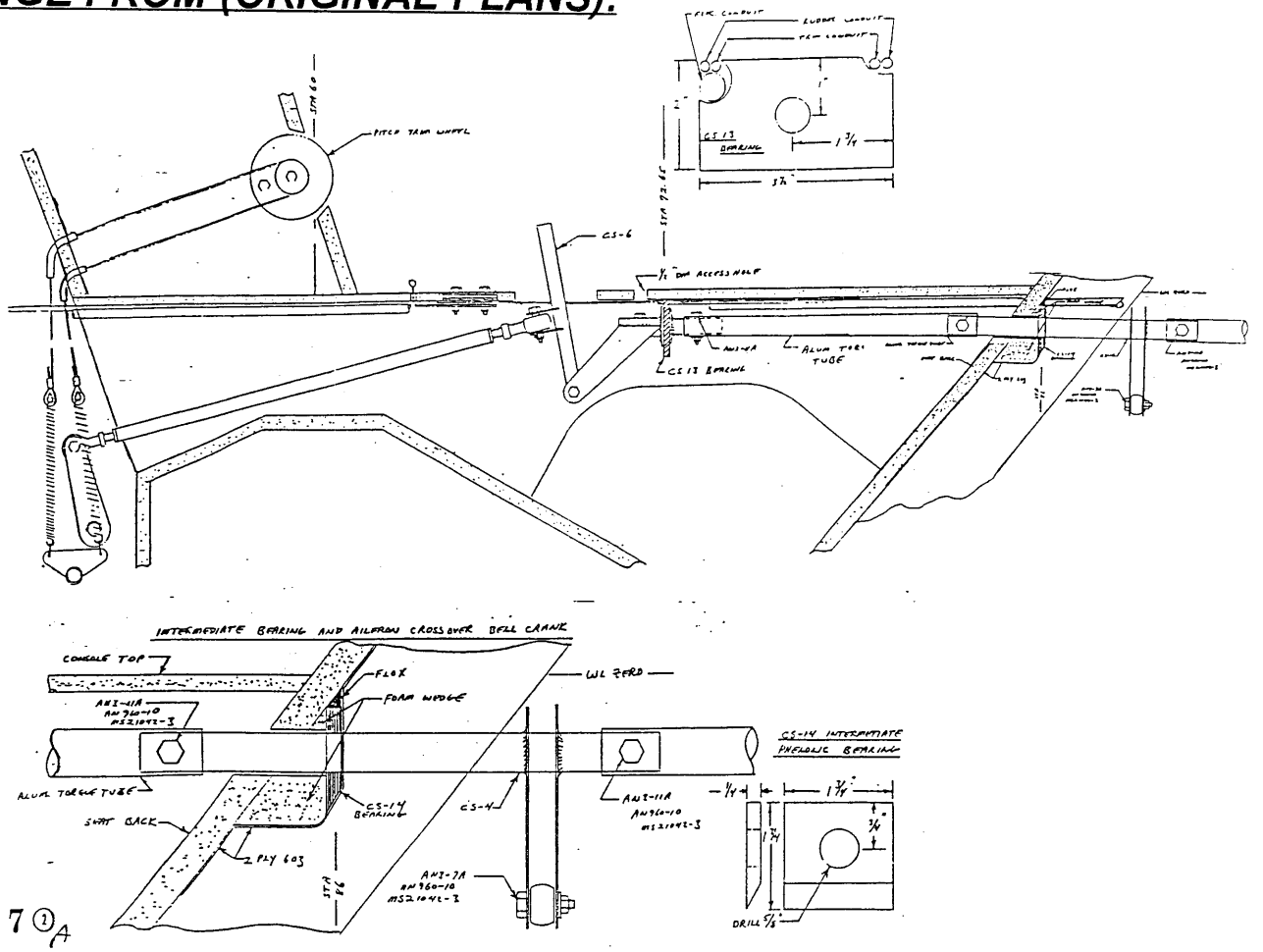








CHANGE FROM (ORIGINAL PLANS):



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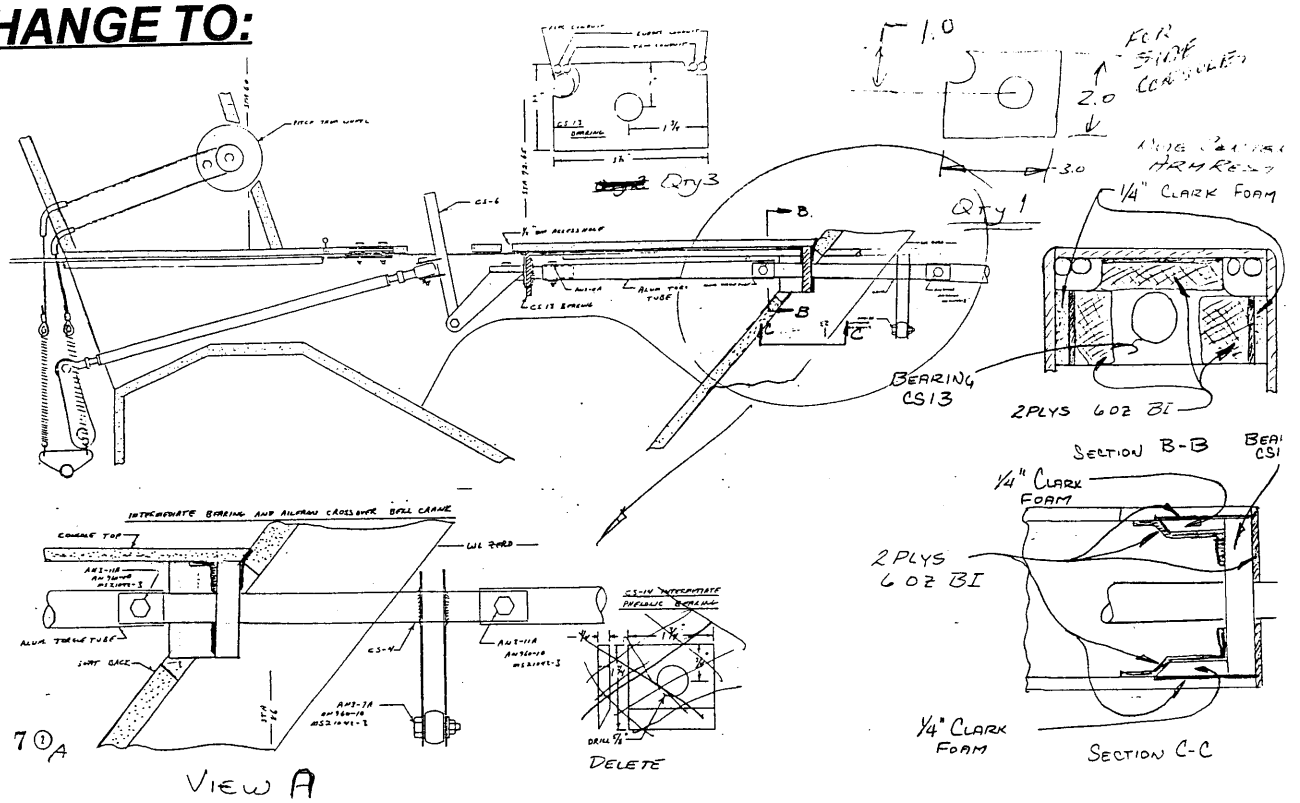

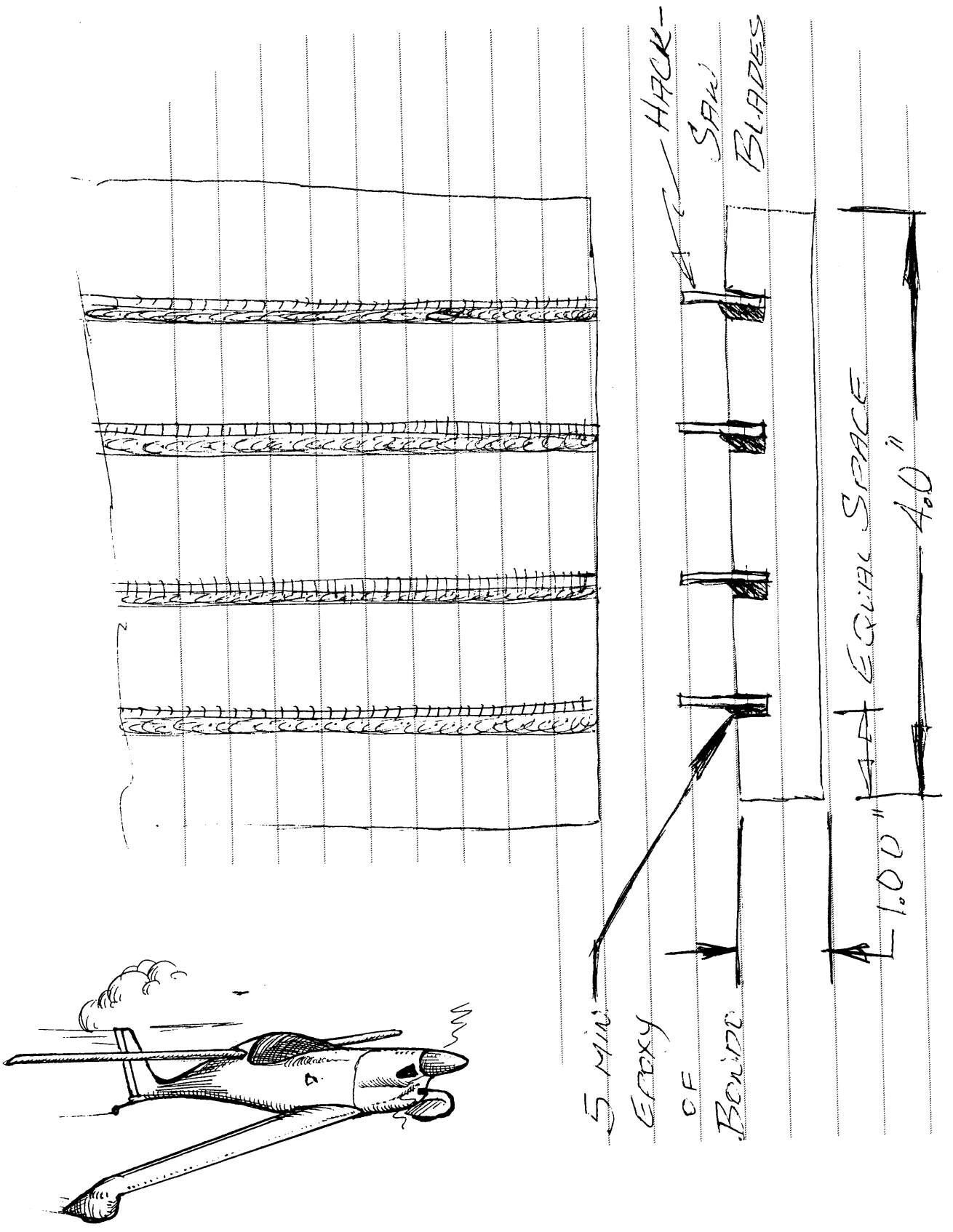
5 min
Epoxy
of
Bonding
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THE CLASSIFIEDS

For Sale: Complete Continetal O-200 disassembled & cleaned, crank, cam & rods magnafluxed and all pass. Case Zyglo inspected & passes, $2500.00 Sterba 60X68 prop $250.00, Spin-on oil filter adapter for Cont. O-200 $125.00, Two new Lamb 11.00X4.00 $50.00 Day (508)668-4784 Eve(508)668-5285 EST

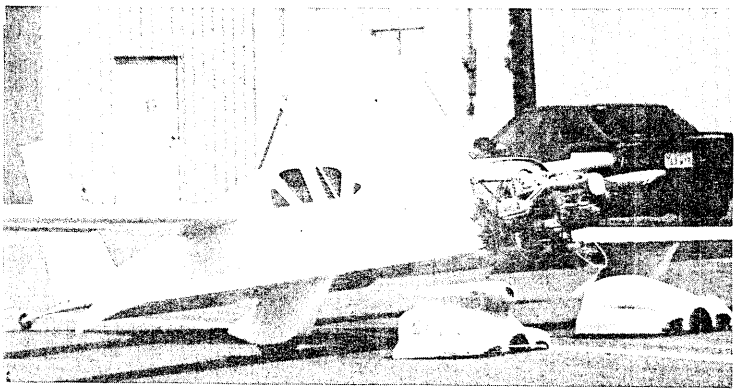
For Sale: Plans built Mark 1 project ready for canopy installation and finish, Hyd. brakes, flight instruments and radio. Hapi 60-DM still in the crate, propeller, engine mount and spinner. $5300.00 Dale Dutt, Richland, WA 99352 (509)967-2744 after 5:00 PST.2

For Sale: Dragonfly, 70% completion. No radios or engine. Mark II landing gear included. Basic instruments included. Invested $5600.00 in 1986 dollars, will sell for $4500.00 Jerry Gonser, 8-5 CST (713)923-2771, Fax(713)923-78222

For Sale: Mark II Dragonfly 70 TT. New style hoop gear, Dual hyd. brakes, Loran flybuddy, transponder, Escort II radio, 4 position EGT/CHT, Vortex generators, Quality workmanship. $14,000. Ask for Guenther, evenings (407) 395-9267 2

For Sale: Dragonfly project 90% complete, all instruments and controls, less radio's, Loran & transponder, 82hp Hapi engine. All for $8900.00 Flybuddy with central U.S. data card $1190.00, Narco Com 810 radio $935.00, Narco AT-150.AR850 transponder/encoder - $955.00 Temper foam for Dragonfly/Q-2/Q-200 seats and headrests - $385.00 Tom Thompson P.O. Box 30 Randolph, TX 75475 (214) 575-4646, home (903) 583-7377

For Sale: Mark II Dragonfly airframe - complete and painted. Cowling needs painting. Revmaster 2100D mounted, 10hrs TT approx.. Also includes Prop, inboard gear, tachometer and quad instruments from Westach, basic flight instruments, strobes, center stick, reflexor, tires and brakes. All $7800.00 Bob (214)980-3733 days & 934-3529 nights/weekends **PHOTO BELOW** <49/50>



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 mock-up 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** <50-54>

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<49/50/51>

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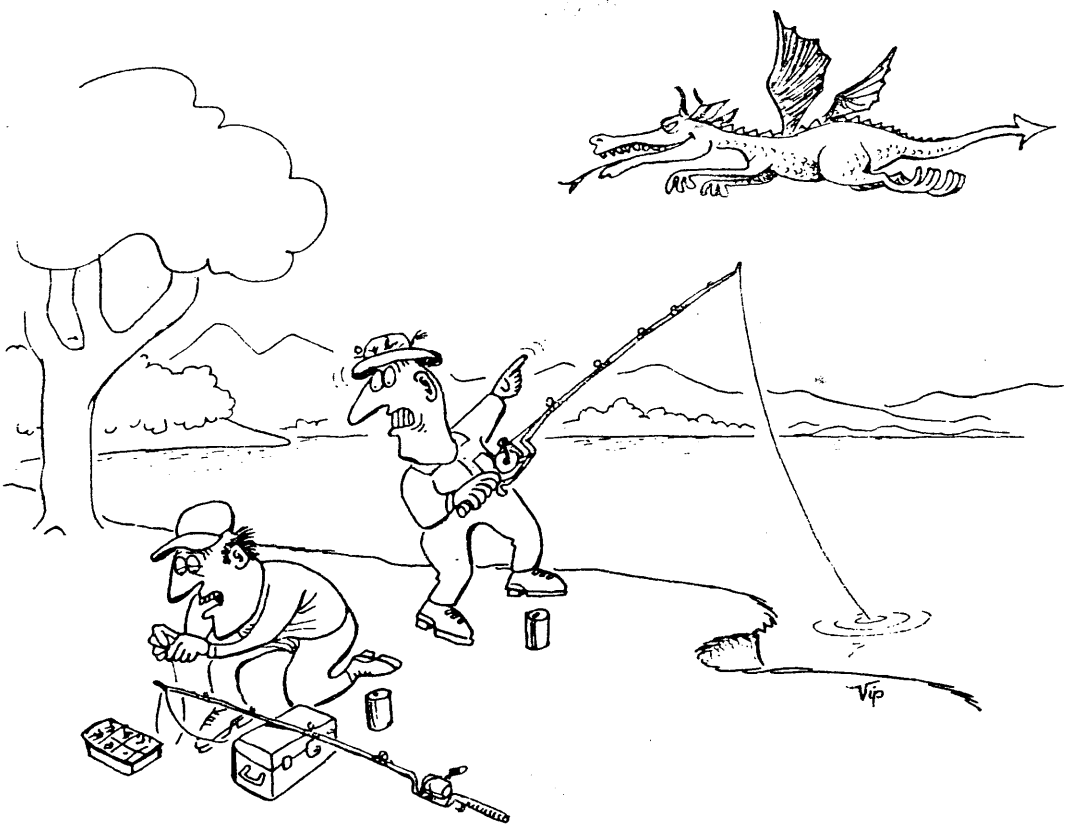

"If you've seen one dragonfly, you've seen 'em all."

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NEWSLETTER

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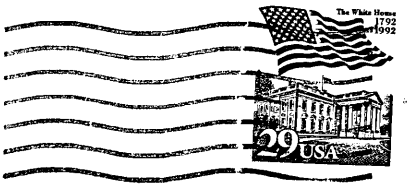

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