

DRAGONFLY

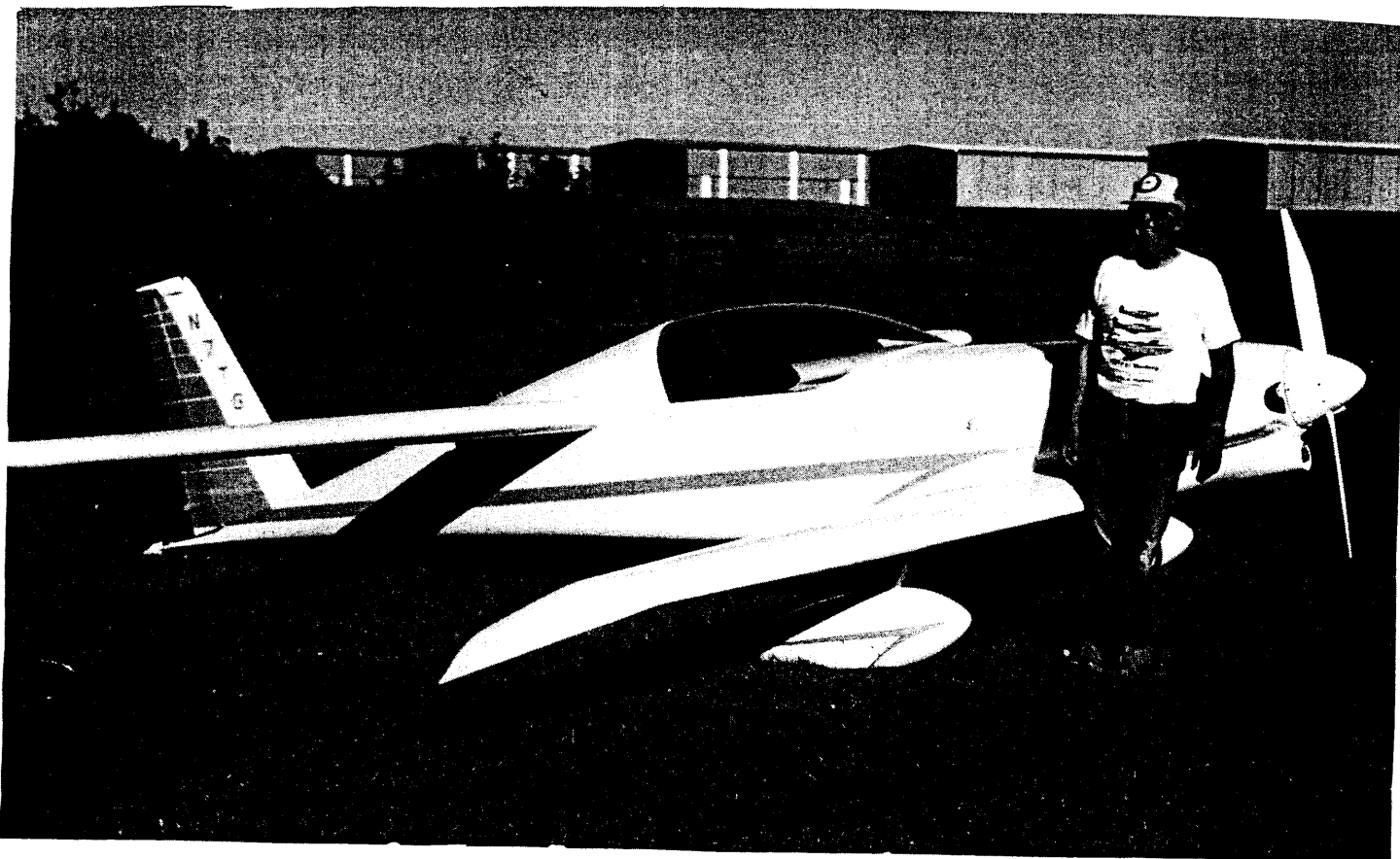
BUILDERS & FLYERS

NEWSLETTER

THE OFFICAL VOICE OF DRAGONFLYERS ALL OVER THE WORLD

VOLUME 35

MAY - JUNE 1991



Tim Gibbs of Woodbridge, Va. Dragonfly

Hello Spud !

I'm really enjoying the newsletter, keep up the good work !

Now lets's talk about my airplane. Let me give you some numbers; It weighs in at 700 lbs. with the header tank full and the engine full of oil (including the oil lines and external oil filter). I started building my airplane October 1985, and it was signed off by the FAA June 23, 1988. It has a total of 190 hours as of this writing. It's a Mark II, with the forward hinging canopy. The only additional items

other than the usual flight instruments are, Hamilton compass, fuel gauge for the main tank, low fuel system for the header tank, electronic CHT, Electronic International Digital EGT w/ carb temp., navcom, Loran C, intercom, Nav & strobe lights. I built the engine myself with most of the parts coming from Great Plains & Hapi. The only real changes that I made was to put an opening in the front so that I could get to the rudder pedals and the section over the wing can be removed without removing the wing itself. The header tank was moved to the firewall and it bolts on.

Spud, I'll be writing more in the future on the test flying of my airplane, the small problems and what I did to fix them. If there is anyone in the Dragonfly group that I can help in anyway please write or call I'll be glad to help any way I can. We do have a good little airplane here.

Tim Gibbs

15920 Uppsala Ct.

Woodbridge, Va. 22191

(703) 680 2969

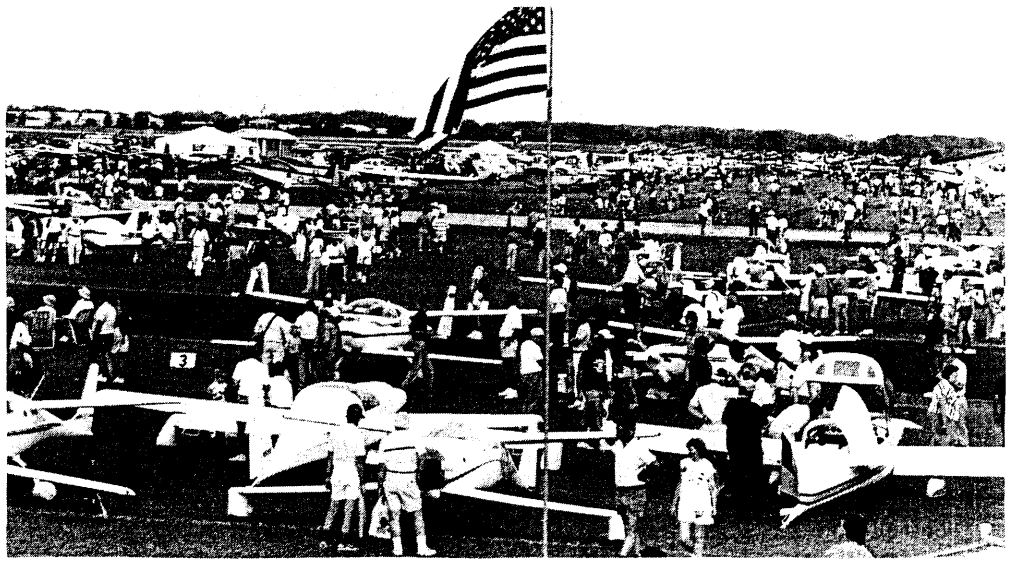
SUN N' FUN 1991

By Rob Kermanj

The excitement of Sun & Fun begins months in advance as you begin to prepare your plane for exhibition, and most importantly daydream about what you will buy at the Fly Market!

This year, like every other year, Lakeland surpassed all previous attendance records on the first day, unfortunately by Wednesday both the number of planes on exhibit and the crowds had thinned considerably. The number of attending Dragonflies was pitiful, two on Sunday (mine and Chuck Ufkes' from Ocala), none on Monday, one on Tuesday (Guenther Kirshctien) and again mine for the balance of the week. Chuck's Dragonfly earned the Best Overall Award for his outstanding workmanship and the clever modifications which we hope he will share with all of us in a future newsletter. I was happy to receive the high timer award and look forward to the day when there will be increased competition in this category!

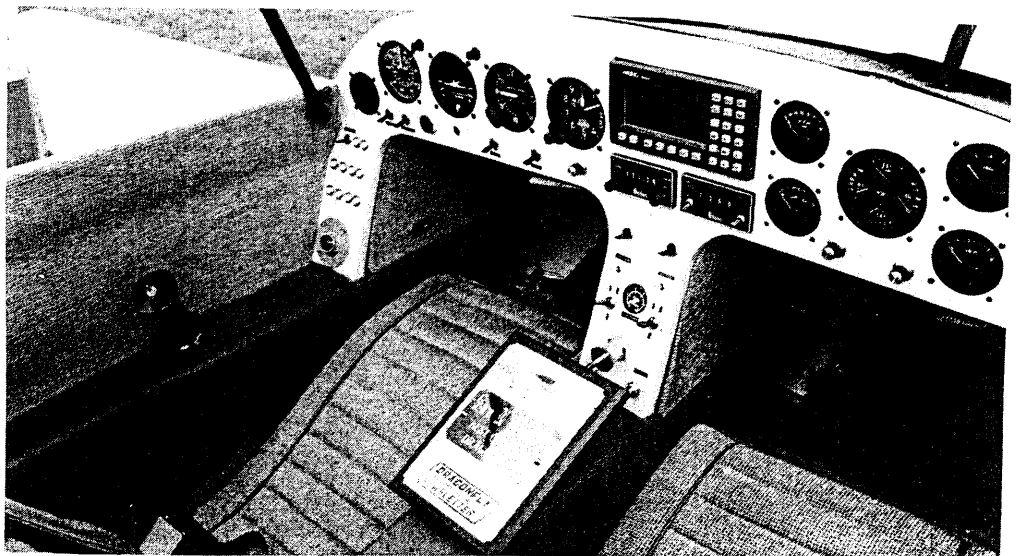
The number of attenders at the Dragonfly Forum was 48. This probably equates to 2/3 builders/flyers and 1/3 interested parties. The meeting lasted about 2 hrs and was very well organized. As everyone probably knows, Rex Taylor left Mosler to work on the Montana Coyote on a 90 day contract. He is now in California and does not wish to be contacted. He



Q-2 /Q-200 - Dragonfly area



Chuck Ufkes - Best Overall Dragonfly



Chucks interior

has the molds for the prefab Dragonfly and is trying to manufacture the parts. Viking Aircraft is alive, and well selling plans and some parts in Helena, Montana and, is being run by Patrick and Robin Taylor. There was a question and answer session and various building techniques were discussed.

Lancair IV left every airplane behind in the Sun Race. During the race, a new racer, the Lightning Bug developed a fuel problem which resulted in a forced landing. The pilot was unhurt but unfortunately the cow died.

Rotax's four cycle 65 HP engine was on display and could be purchased for \$8500. The vendor area was full of tempting gadgets but prices were notably higher. About the only bargain I noticed, other than the good old Dragonfly, was a subscription to DUAT services where, with a computer and a modem, you can obtain a weather briefing on your screen (your subscription fee has already been collected via your Taxes).

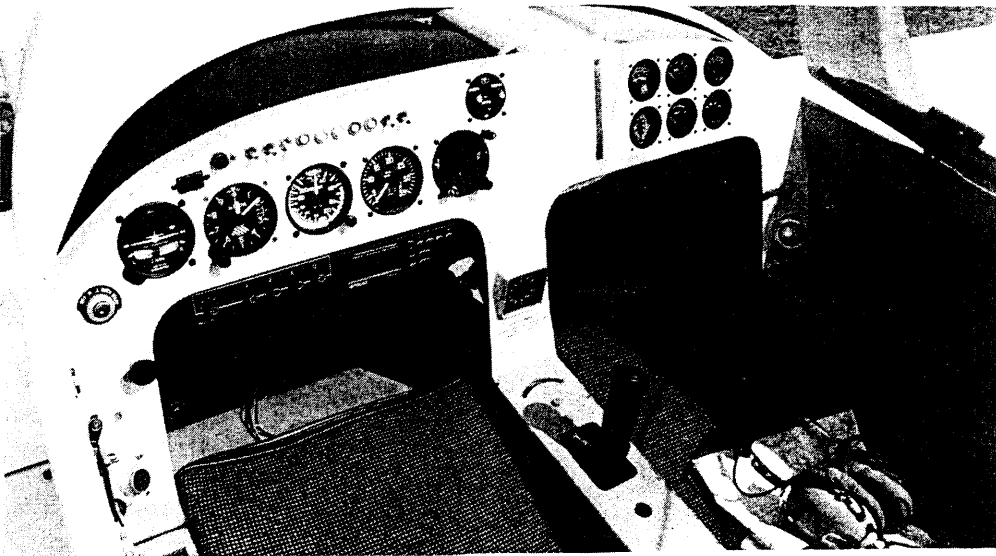
All new developments on display at the show seem to fulfil either the top end on the market like the Lacaair IV, or the low end of the market via ultralights. The ultralight area was the most active place at the show and it was well worth the walk over to sit in on their flight briefings where the conversations and directions were met with lively controversy!. The ultralights begin flying at 7:00 AM and afford the best opportunity to have a truly bird's-eye view of the display and camping areas. Mosler had a tent in this area and displayed their engines. I noticed that the alternator is mounted outside of the accessory case and looks like an improvement over the internal dynamo installation on HAPI engines.

Of course the air show was fantastic as usual but, for those of us who have seen many of them, it was Clint McHenry performance with the Russian Sikoi that highlighted the event.

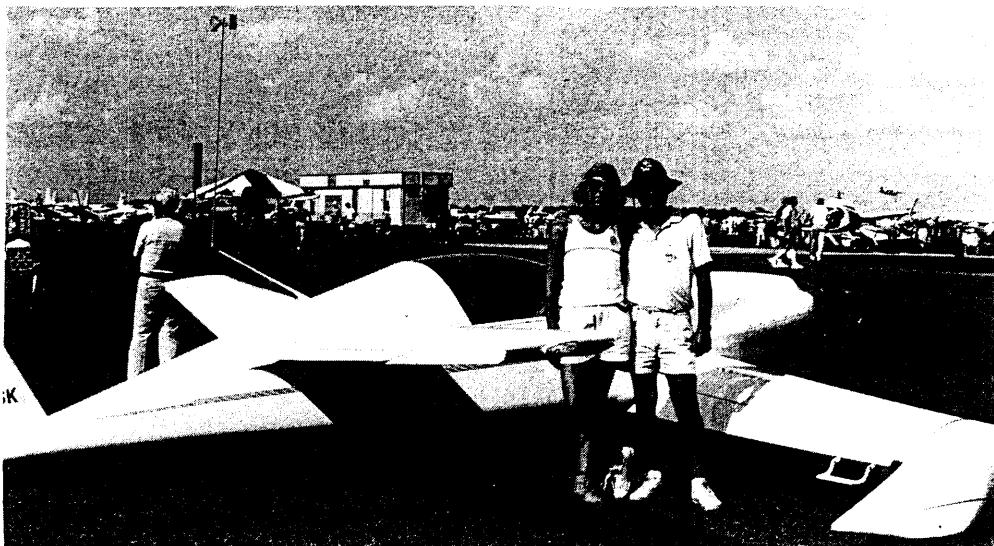
Like everyone I am counting the days to another aviation event; let's see.... the Dragonfly Swarming is only four months away, Oshkosh three months



Rob Kermanj - High Timer Award



Rob's interior



Rob and Elizabeth

and, Lakeland a very long eleven months.

Rob Kermanj

1240 N.W. 8th Street

Boca Raton, Florida 33486

**EVANS BROTHER
GEARED STARTER**

Dear Spud,

Just thought I would send you some information on the adapter for the gear reduction starter that I mentioned in earlier correspondence to the newsletter. I have had several people write to me for more information so I thought I would just let you put it in the newsletter so everyone can use it. My brother Gene, who should get credit for this, teaches a numerical machine shop class at a nearby community college and had the coordinates for the adapter stored on a hard drive that crashed and as of yet it has not been retrievable. We did have one adapter left over and I have enclosed a tracing of it for the gang to duplicate.

The starter that we use is a relatively small gear reduction

starter that comes on 1986 or later GL 10 Subaru cars. It is manufactured by Nippodensen which makes a large number of starters that look exactly like this one but you must get one for the Subaru because it turns the correct direction for the VW when mounted from the backside like the original Bosch starter.

The adapter for the starter is made from 3/16" aluminum plate. The enclosed fullsize drawing is for the adapter to fit the HAPI case. You remove the two original metric studs and replace them with metric 8mm x 1.25 flathead screw that are countersunk to fit flush to the adapter's surface. We felt that the adapter could use some additional support and therefore drill a third hole for another flathead screw. You will have to drill and tap into your drivecase for this extra support screw so be extremely careful that you don't go too deep and drill into you alternator windings! Once the adapter is mounted on the case the starter is simply bolted on with two 7/16" nf bolts.

This adapter can be used on a Revmaster drive case simply raising the two countersunk holes that locate the adapter on the two original studs about .070 of an inch. Leave all other hole locations the same.

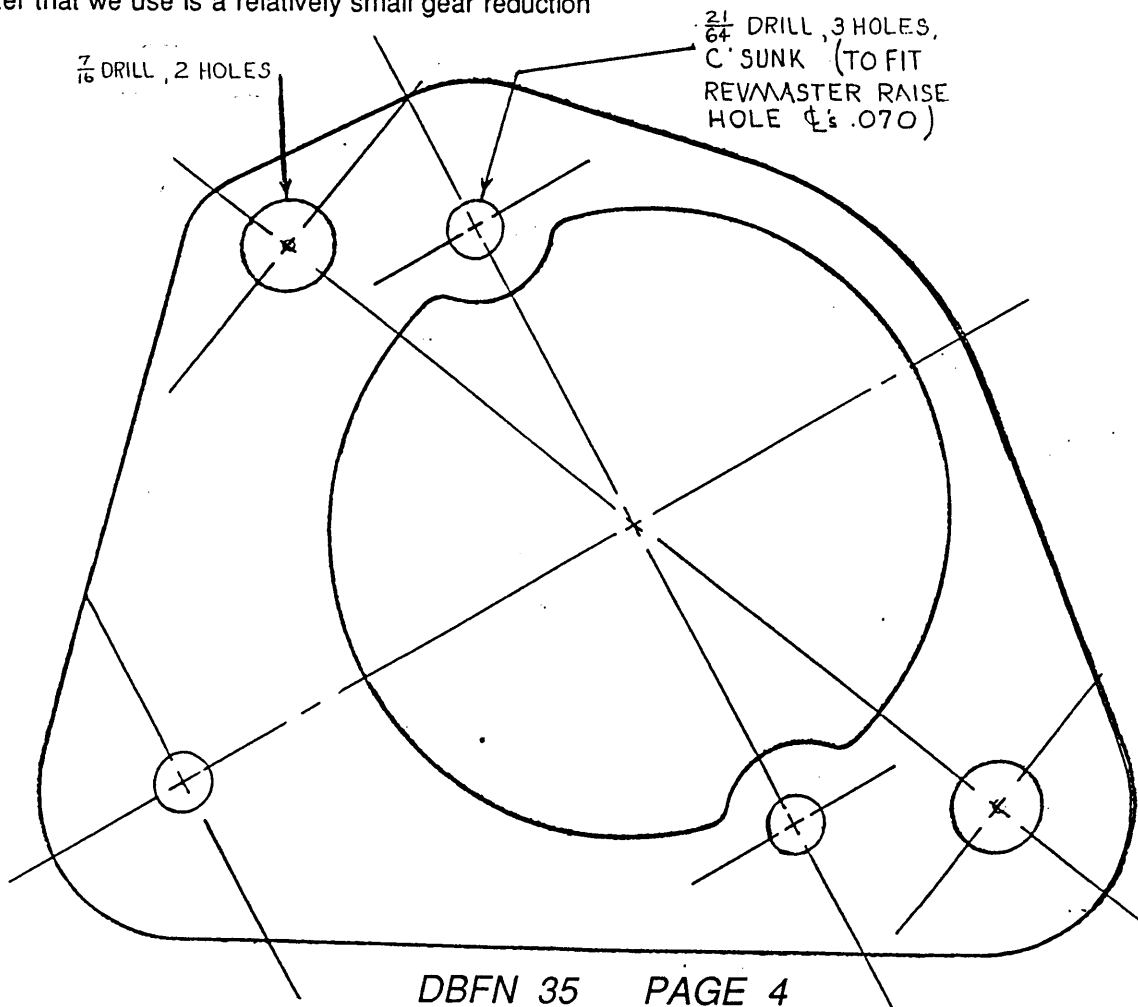
Hope this will help and keep-em flying !

Guy Evans

5545 W. Pershing

Visalia, Calif 93291

SUBURU STARTER TO VW ADAPTER - FITS HAPI DRIVECASE
3/16" ALUMINUM



FLYING A MARK I

Yo, Spud Dude !

(that's Californian for Hi!)

Just got off the phone with you and I agree that it would be a great idea to share my MK I experience with those builders who have not flown yet. The first thing I did was learn how to taxi, slowly making my way up to the faster speeds using a nice wide runway (100 foot). I never went over 40 mph because I didn't want any inadvertent flight until I was ready.

With the help of my good friend Jack Shafer who gave me about 3 1/2 hours of dual in his DF MK II. I feel that getting some Dragonfly time in before you fly your DF, MK I or MK II is very important.

I had made a mental image of what it should all look like and feel from reading the newsletters before my dual time with Jack. When I flew in Jack's right seat it all came together. After that 3 1/2 hours I was a long way from proficient, but knew I could fly the plane safely. I had "the picture", you know, proper glide slope (for the Dragonfly), speeds, the sense of just being just off the runway and knowing when the wheels are about to touchdown, when you have this "picture" you'll know it.

Now while all of this applies to all Dragonfly's, knowing your proximity to the runway is especially important on the MK I. You see, I noticed and understood that you don't want to fly the DF in the normal sense. It is very important to basically "fly" the airplane onto the runway with a very low rate of descent. I also have noticed that if you take your calculated approach speed, I use 70 mph solo and add 10 mph to this figure. This gives you plenty of time to really grease it on. There is a trade off for this technique, it will add about another 1000 foot or so to your landing. This makes it so much easier and provides much better visibility because the tail is higher at 80 than at 70. I have still never needed more than more than 2500, even with my Azusa brakes. Once you get better you can really "drag it in" at slower speeds.

The only disadvantage to the MK I that I see are that you need at least a 40 foot wide paved runway. I have used a narrower runway and it was no big deal, however the wind was dead calm.

You also can't be sloppy with your landings. Your motto should, "bounce it, push up power & go around". The Dragonfly does this part very well, in fact go-arounds are so easy there is no reason not to go around.

Mark II's definitely have their advantages, but there is no need to be scared of breaking your Mark I canard if you fly the plane properly. You don't have to be a super pilot

either. I had no taildragger experience and was a 41 hour student in Cherokees at the time of my dual training with Jack and 69.8 when I soloed my Dragonfly. Like Bob Walters & Rex Taylor have said "The Dragonfly isn't hard to fly, it's just different". I now have 125 hours on my plane and have had nothing but FUN, FUN & more FUN! I really enjoy it.

Robert Sledge

Travis AFB, Ca.

ROB KERMANJ 'S VORTEX GENERATORS

Dear Spud:

My hat is off to you! The newsletter is very impressive and Nathan deserves many thanks for his persistence and follow up in organizing the drive for its publication. I will be delighted to write on an ongoing bases, just tell me what topics you prefer.

Here is the specs for my DF:

DRAGONFLY 515SK SERIAL # 342, MARK I:

Total Hours: 610 hrs.

Engine/Prop: HAPI 60 2DM - 310 hrs./Great American 52X42. Climb: Bad. Cruise Speed: 145 MPH @ 3200 RPM, Clocked; 127 knots indicated. Max. Cruise: N/A.

Limbach 2000 EO1 (Nice engine!)/Great American 52X50. Climb: Good; (Me, 160 lbs. + Wife, 130 lbs. + Nick, the Flying Dog, 35 lbs + 15 gal. fuel = 300 fpm climb @ 90 knots indicated @ 6000 feet). Cruise Speed: 145 MPH @ 3000 RPM; 127 knots indicated. Max. Cruise: N/A.

Weight: With Hapi Engine and no mods: 649 lbs. With Limbach and all Mods: 714 lbs.

First Flown: August 7, 1986.

Years to Build: Approximately 4 years +.

Hours to Build: Forever according to the wife, 2000 + by my estimate. Modifications: Vortex generators. Removable Turtle Deck. Toe Break Pedals. Cleveland Wheels and Breaks. Revised Elevator Trim (looking for better stuff!!).

Panel Stuff: Narco Escort Nav/Com. David Clark Isocom. Apollo Fly Buddy Loran. King Transponder/Narco Encoder. Electronic fuel quantity sender.

I am Considering installing aileron reflexors to provide better cruise speeds and as an effective elevator trim. I have also built a new control system to combine the elevator and ailerons. I think combining the two will lighten the roll forces considerably but, I am awaiting courage to

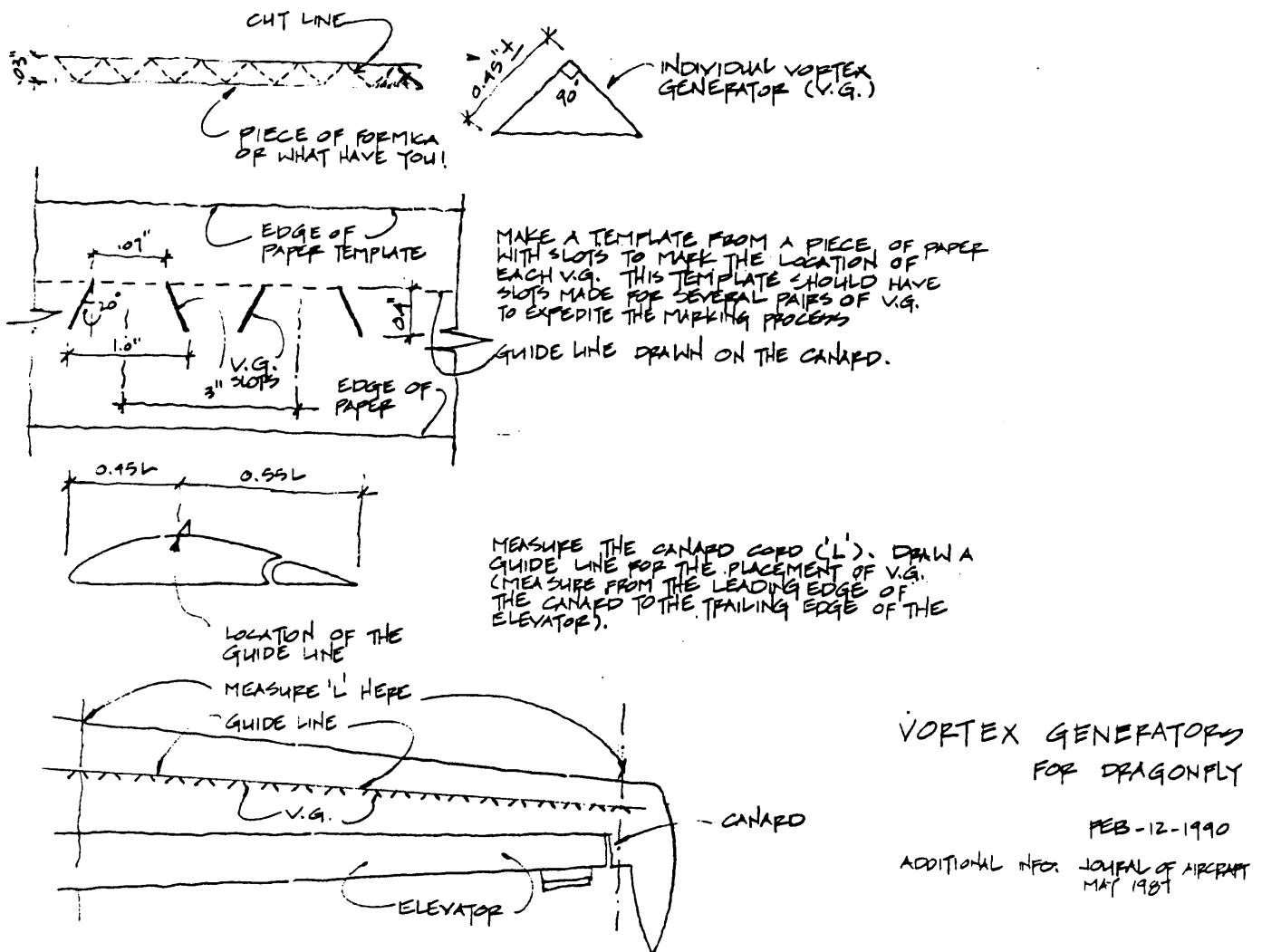
test the new control system!! I will submit the plans in the future for everyone's review and advice.

apparently he forgot my advise, and flew in the rain and came back unhappy.

Now... the Vortex generators. I had read articles in Rex's newsletter about the Dragonfly's good behavior in rain. In fact, as of today, I hear about Dragonflies that apparently do not show nose down tendencies. The first time I encountered rain I was at a fly-in in Pompano Beach, Florida and was heading back to Boca Raton at the end of the show. It was raining over half of the length of the runway at the take off end (it is not unusual in Florida to have this condition and see wet and dry pavement clearly defined). I decided to take the chance since I expected to be airborne in the clear area. The wings lifted when expected but the canard did not. I gently pulled the stick, the canard lifted and slammed back on the runway. After gaining more airspeed, I tried once more and the same thing happened. By this time I was in the clear area and, as soon as the canard was dry, the airplane took off normally. I got back to Boca Raton and told Guenter, a DF builder, who had just finished his DF, to never take off in the rain (I'll get him to subscribe soon Spud). Later,

I decided to investigate this thing before I conversed with Rex. I would fly near showers and feel the airplane pitch down and, shortly after see the rain on the canopy. My stall speed was now 80 knots indicated and I could not imagine flying such an airplane in Florida where the weather may be beautiful where you are but raining at your destination only half hour away. I rented Rex's template and checked the wings and the canard angles of incidence and found that everything matched within a very small fraction of a degree. The shape of the airfoil seemed to be very close to the template. By this time I had cooled off and concluded that it was up to me find a solution.

I had noticed vortex generator on some Quickies at Sun & Fun. I believe that it was Jim Masal who directed me to an article in the Aviation Journal where several shapes of Vortex Generators had been tested in a wind tunnel for the Voyager. s like magic! It is one of the few modifications that I have made to anything that worked on the first



- V.G. DIMENSIONS ARE APPROXIMATE. SOME OF MINE ARE ABOUT 0.50" HIGH.
- USE SILICONE BATHROOM CAULK TO ATTACH V.G.

try. One word of caution; who knows if this modification will work on your airplane? If you choose to install them, do your flight testing step by step. Don't fly into heavy rain the first time. This is really true with any flight testing. I believe that I managed to keep my airplane in one piece by slowly increasing the complexity of each flight and each landing. I am wandering off the subject but, it seems that there are many people getting ready to test fly their plane. I know that any one can fly the dragonfly safely; I was a low time pilot when I finished my plane but managed to keep my plane and myself in one piece by not jumping into it.

Kansas is a good choice for the Swarming and I will do my utmost to attend. Let's schedule this event when the weather patterns will be as favorable as possible. I am not familiar with the weather in that area but, I have seen some ugly stuff on TV pass over that part of the world.

Sincerely,

Rob Kermanj

1240 NW 8th Street

Boca Raton, Florida 33486

Day - 407-392-7062 Evening - 407-395-9267

EDITORS CORNER

I have several things to comment on;

First off we finally have enough orders built up to order the T-shirt. The artist is working on the design and printing should be done by May 30th. Attaboy everybody! I appreciate everyones support on this project.

I have had several comments that my "Zest" for this newsletter project is because I have bought into Viking Aircraft - Nope!. I took on this project because I felt the Dragonfly design, the builders & flyers of this group have a tremendous amount to offer each other. We needed something to bring us all together and a way to communicate about our planes. And I think we have a good start on our goals! The Dragonfly has a spot in Sport Aviation.

Swarming ! We have tentitvly planned this event for Sept 21st, 1991 at Industrial Airport / Olathe, Kansas. We have had people write and/or call from all over the U.S.. I don't want to invite all these people to this event and have a poor Dragonfly turn out. What I need to know is, Who will fly their Dragonfly's to this event? I know that this is 5 months away but we do need this planning time. What I need from you guys that are flying is a "pledge" of your attendance (of course weather permitting). Now I know a million & one things can come up, but we need to plan. This is our event, we have to make it happen ourselves! What I would like you guys to do that are flying, or are

close to flying and are planning on attending, please write, call or fax me ASAP! People flying in that would rather camp than stay at a motel will be welcome to stay at Bill Brutsman's and my house, either on the couch or set up your tents in both back yards. Come on Guys! let's make this one the biggest ever!

Now Six times a year! As you can see DBFN is now coming to you 6 times a year. I have no problem with this because the info is good & plenty but I want the option to return to 4 times a year if the input to the newsletter drops off. Mail dates for the balance of 1991 will be as follows; May 28th - May/June issue, July 15th - July /August issue, September 8th - September/October issue, November 10th - November/December issue.

A major portion of the groups subscription runs out with this issue. There will be a notice enclosed and you can verify by looking at your mailing label. I would appreciate your prompt attention to this so I don't have to mail out reminders. This will save me a bunch of time. I hope the newsletter has been a value for everyone. As you send in your renewals please take time to tell us about your plane and your recomendation for the newsletter.

Oshkosh! We have a Dragonfly forum setup for July 28th, Sunday nite at 8:00PM. I have also scheduled a group meeting at the Homebuilders Corner building. They have a back porch & a Tent that is setup for builders groups such as ours. We have the tent reserved on July 27th ,Saturday morning 10:00 to 12:00. This will be a very informal meeting where we can just get together and talk (Bull session) about our planes & projects. Those people planning on camping (flying or driving) at the event, we have a special place reserved for us already. More details on this in the next issue. The next thing that I need to now is who's planning on flying their Dragonfly to Osh this year. I need to know soon as pratical, even if it is tentative, in writing or by phone and then a week before the event so I can request line space so we can attempt to park all together. Ed Dassow who lives in West Bend, Wiscosin (half way between Mllwaukee & Oshkosh). He has a very large hangar and has offered to the group the use of his facilities for the night. He also thought it would be neat if we could all meet there on Friday or Saturady morning and fly into Oshkosh as a group. Also as a reminder, everyone that has a Dragonfly, all experimental planes get into to the event no matter how full the are.

The response to the builder/flyers questionnaire has been coming terribly slow. This questionnaire was meant to be filled out by **everone**. We all need to get this completed and in or we are not going to have much of roster to report. Gentlemen, DO IT NOW !



MULTICOM

Robert Roets of Windsor, Wi. was at the Sun N' Fun forum. He wants to put out a request to everyone that has or is working on installing the Subaru EA81 & EA82 engine in their Dragonfly's. The areas that he feels we should examine are the different types of drives, engine mounting, cooling system, radiator location and ducting. He's working on a drive set-up himself that he feels will be very economical and will make the Subaru engine an even more viable powerplant choice. OK Guys there's your homework ! Lets get that info into the newsletter soon - Spud.

Chuck Kaplan of Wapole, Ma. called me today and asked if I had the instructions that come with the Micheals Epoxy pump. He wanted to tear his down, clean it up and put fresh seals in it. I told him "No problem" "Piece of cake" "I know right were it is" "I'll get it right out". Well after a exhausting search and to make a long story short. Chuck and Spud would now like to know if anybody out there has their instructions for their pump. We'll put it in one of the upcoming newsletters in case "Chuck" loses it again !!!

Chuck also thought it would be a good idea to see what everybody is doing for fresh air ducting into the passenger compartment on DF's. The questions that came up with are; Is anybody having good luck with the original locations? Naca ducts moved forward into a high pressure area? Exhaust outlets, size & location? Is anyone picking up airflow somewhere off the engine compartment baffling? Noise / location factor?

One more question from Chuck. He has machined the phenolic donut for the Aileron reflexor system. He was wondering what is the proper lubricant for phenolic when the hard glaze has been removed ?

George Childress of Levelland, Tx. Wanted to now if anyone in the group has changed from Hapi Super carb to a Hapi Ultra Carb. What did they do in the change over and what were the performance changes if any? If there is anyone out there that has done this changeover? We sure would appreciate the input. He has also briefly commented on the stall characteristic of his plane with out the elevators limits installed. He said that the stall was "very sharp" and he was "very" glad that there was plenty of altitude. He'll expand on this in one of the upcoming newsletters after the test program is finished.

Hi Spud, I wrote you a few months back concerning the problems with my aircraft. (Heavy aft stick pressure). Since writing you, I have made the following changes / adjustments: 1. Moved the battery aft of the wing. 2. Installed trim tabs to trailing edge of wing. 3. Adjusted ailerons slightly up. 4. Modified elevator trim system. With

these adjustments & changes I am still unable to trim the aircraft too fly hands off at high speed. Would like to know if any builders or flyers out there have had this type of problem or could shed a little light on this problem.

Gary Sheets 8120 E. Southport Rd. Indianapolis, In 46259
(317) 862-2617

I received a letter from Ben Owen, Executive Director of information services of the EAA / Oshkosh. He supplied us a listing of all the Sport Aviation issues that had some type of info (some just brief notes) on the Dragonfly. These back issues are available from the EAA at \$2.00 each which includes the postage within the US. Thanks Ben.

MONTH/YEAR/PAGE	TITLE
9 80 32	Introducing the Dragonfly
10 80 58	Outstanding New Design at Oshkosh '80
8 81 28	Dragonfly - Curves/Composite Structure
10 81 5	Viking Aircraft Moves - new address
10 81 65	Dragonfly Design Origins
2 82 23	Finishing Composite Aircraft (Dragonfly)
9 82 8	Dragonfly Rights Sold (note only)
9 82 40	Kenny Ranta's Dragonfly with 3-bladed prop
11 82 58	Flying the Dragonfly
3 83 10	Pre-fabs available
7 83 6	Dragonfly get-together @ Eloy, AZ
9 83 55	Dragonfly History
3 84 28	Videotape available
4 84 25	Con Hewes' Dragonfly with front hinged canopy
7 84 8	New landing gears offered
3 85 7	New developments with Dragonfly/Bldr's
3 85 51	Brad Chamberlain's Dragonfly
5 85 48	Dragonfly now has new inboard gear
6 85 7	Dragonfly now has hydraulic disc brakes
7 85 41	First Dragonfly flies in Australia
2 86 30	Wolfe Dragonfly with 60 HP engine
5 86 89	Seegers Dragonfly with Lyc. 65
6 86 89	Homsley HAPI-powered Dragonfly
4 86 39 LPW	Loose Ballast Cause Fatal Crash

I'd like to offer the video tape editing and duplication of the other DF builders who would like to send me their video taped projects to be included and passed around the country to the other builders. The phrase " a picture is worth a thousand words" is still true! Should anyone be interested in forwarding their footage, please include a few shots of himself in the pictures. The following is a list of video taped programs of builders and their birds:

Larry Brown - MkII gull wing, steel landing gear legs, articulated elevators, 2100cc Limbach, currently flying (C.F.)

Bart Gunn - Tri-gear, VW 1835, Reversed Glasair main gear. C.F.

Bob Roe - MK II, Gull wing canopy, steel landing gear legs, VW 1835, C.F.

Claude Canterbury - MK II, under construction (U.C.) Limbach 2000CC

Bruce Dixon - MK II, building progress from 1987 through 1990

Continued on page 14

LETTERS, LETTERS, LETTERS

My Telefax #049 7195 8180

Spud do you have a Fax #

Sure do # 913 371 0824

Hans Graesser

Dear Spud

In general I don't like the daily mail arrival. There is always too much #?*(%^& coming in. But this is a good day because of theres a new newsletter.

No I am not flying my DF. She was ready to test fly when I stopped the project. There were two reasons for this. First there was bad news from France where two severe accidents (I only heard of one???) with DF MK I's. I knew the friends and felt miserable. The second reason was the coming of the Lancairs.

Thre friends of mine persuaded me to form a gang and start building Lancairs. This was May of 87. I agreed, became the gang leader and we started on 4 Lancairs kits. After a few months one group member had to quit. We agreed upon building his plane together along with the other 3. Some months later my other two buddies stopped their projects. They had lost all interest in their Lancairs. The efforts and time needed to complete their projects had made them give up. So I found humble self in the garage building two Lancairs all alone. It took me two years to bring the planes to almost complete status of today. I hope to get ready to fly them spring/summer 91.

Since 87 my DF is sitting in a barn. She's not forgotten however. I am working on a series of calculations aimed to redesign My Dragonfly. I wanted to own a single seater airplane and I think that a modified DF could be such an airplane with lots of room and hence comfort.

I am planning to;

1. Alter the position of the fuel tank. (In memory of a French DF -Pilot. I don't feel comfortable remembering him sliding on the belly of a broken canard).
- 2.Alter the flight controls (don't like thinking of flutter)
- 3.Try to install a retractable undercarriage (one wheel if possible with retractable outriggers) into the fuselage.
- 4.Redesign the wings using finite element analysis for a sandwich structure. Maybe there is another DF-builder interested in cooperation (non-commercial) I would appreciate it if any interested people would contact me. This might be prolific teamwork.

That's all for the moment. I hope that you will be successfull with the newsletter.

Sincerely

Hans Graesser

Markstrasse 56 D-7057

Winnenden Germany

Dear Sir,

I am looking for a completed Dragonfly wing and canard that anyone has for sale or if I could have someone cut the billets for me or even build both complete for me. I sure would like to know if anyone out here could do this project for me. Off course I would glad to pay for these services.

I have completed my bulkheads, fuel tank, turtle deck covers, consoles and small misc. items. I would like to buy the video of Rex Taylor's " How to build a Dragonfly" tapes (these are available from Viking Aircraft for \$89.95).

My age is getting away from me and that's why I'm in such a hurry. I hope someone out there can help me get this project completed.

Spike Gunderson

9701 Tyee Ct.

Kelseyville, Ca 95451

Father Don Coutts

Dear Spud,

I am building a Dragonfly in partnership with two Anglican (Episopalian in your country) priests and are very close to the final taxing stage; the delay has been not so much the difficulty in building as putting in the time together as we have been seperated to three different parts of a very bug country (as big as the mainland U.S.A.). We still have no doubt that this aeroplane is the one to build for our needs (and our pockets) and it suits Australian conditions.

Keep up the good work the good work you have begun and I will endeavour to keep you informed on the progress of our project.

Your fraternally in Christ,

Father Don Coutts

P.O. Box 40 Penola 5277

South Australia

Phone (087) 37 2554

Hi Spud ! We have some new enthusiasm & interest here

in the Phoenix , Az. in the Dragonfly. You should be getting 2 or 3 new requests.

One subject that might be appropriate for people that are buying partially completed projects would be to highlight the "official" plans modifications as this info isn't universally known such as: Elevator modification, rudder, bellcrank & gussets - Etc.

Larry Brown

Phoenix, Az

Jerry Scott

It was good talking to with you a couple a weeks ago - Again there are a lot of grateful builders that you took on the challenge of a newsletter - Thanks!

I want to express some of the thrill of flying a Dragonfly that was created by myself.

After building and test flying two Dragonfly's. The thrill of first flight is the same, the anticipation (fear?) is or should be there. My second Dragonfly was built with all the proven parts & designs (so I thought). I was very confident that the airplane was a turn key & go fly.

On my first high speed taxi at lift off speed, the engine stopped cold - so much for turn key & go fly. I knew it must be fuel starvation because the engine started right back up. Back at the hanger we ran fuel flow tests "again" at different angles of attack, we had fuel flow of 15 gallons per hour which is normal, checked reversed or pinched lines, Etc.. Now I started grabbing at straws ! I thought that we had a possible vent problem. Nothing found there, we even checked to see if the vent was in negative air pressure at that lift off angle. Well after messing around with all this stuff for a couple of days, a fellow KR2 builder came over to shoot the bull. I told him of my problem, Guess what! He had the same problem with his KR2. The solution was simple. The stock needle & seat in a tillotson carb will not flow enough fuel at full power to keep the float bowl full. The fix - install a gross valve instead of a needle & seat. On any first flight (all flights for that matter) believe if it can go wrong it will!

Well enough of that - how about some of the pleasures of flying your Dragonfly that you have created. If you can imagine flying a motorcycle or sportscars of the air. the Dragonfly is it, you are a part of this machine - you think up, down, left, right this machine will do it & give you change back.

The Dragonfly realistically cruises 140 indicated, so please don't look for super high numbers. When you stop & think about it, it turns out at 155 TAS and burns 3.5 gph . Huh ! Lets see any of those factory planes do that.

Last spring several of us Dragonfly builders took off in

formation & headed for Palomar to eat lunch. Palomar is about 60 miles from Chino. After a very short flight we landed at Palomar (What a thrill to takeoff & land in formation with your other Dragonfly buddies !) The tower gave us taxi instructions to park at the base of the tower, actually under the nose of a Lear jet. You'd thought we were putting on an air show! We had people flocking over to see Dragonflies, even the controllers took turns to come down and see our airplanes. What was amazing that not one of all those people took time to admire the Multi-million dollar Lear jet that we were parked under. All they wanted to see was our unique airplanes that we had created.

I know there maybe a lot of guys out there that may have slowed, stopped or gave up on their projects. But at moments like these all those hours & hours of building, sanding & eyeball engineering was all paid for.

Jerry Scott

7210 Puite Creek Rd

Corona, Ca. 91719

Dear Spud,

We heard about the newsletter from our good friend, Tim Gibbs, Sign us up.

We completed building Dragonfly #381 in July 1988, and I (Johnny) flew it on the 31st of December 1988 at Shannon Airport, Fredericksburg, Va.. Shannon's runway is only 3000ft long by 100ft wide, so it was not ideal for testing the Dragonfly. I would have preferred to have at least 4000 ft and would strongly recommend that to anyone testing the Dragonfly. I flew approximately 20 hours on the test program before moving from Virginia after retiring from civil service. The plane is still in the hangar at Shannon awaiting my return in 1991 to continue the test flights and eventually moving the plane to Mississippi. We share the hangar with Tim Gibb's "award winning" Dragonfly, so our plane is in very good company.

Information about our plane: Serial # N52MT; it is a Mark I (outboard gear) powered by Great Plains Aircraft supply - 18c engine. We used Ken Brock metal parts, except for the few that we constructed ourselves. Brakes are hydraulically operated from a single pull device as shown in the plans. We did add spring loaded catch arm rather than use the rope specified in the plans. We added a hatch in the forward fuselage in front of the canopy. and constructed the fuselage section over the wing to be removable. Navigation lights and top & bottom fuselage strobes are installed. The fuel system is per plans, except we installed an electric fuel gage, and constructed an emergency hand pump using a Black & Decker Jack rabbit pump to enable to pump fuel manually from the main tank to the header

tank in the event of electric fuel pump failure. We installed a 2 1/2" Vacuum turn & bank indicator and powered it with a small venturi tube mounted under the fuselage. Most of the instruments are of the small variety.

The empty weight of N52MT is 782 lbs., probably one of the heaviest flying. We used Tri-ply on the wing and canard, which may account for a little of the weight: but I think most of the added weight is in wet lay-ups and generous quantities of micro used in the finishing process. So what the plans and Rex say about being careful to keep things light during construction is "Super Important"!

One of the major problems we had during construction was jiggling the fuselage, or rather a lack of jiggling during the assembly of the bottom, sides and Bulkheads. If we were to build another Dragonfly, I think we would design some system for keeping everything in alignment better than what was described in the plans. We also had some difficulty getting the wing, canard and fuselage aligned during the initial mating of those parts. We recommend new builders work on improving those construction steps.

During construction of the left aileron, we inadvertently built in a slight twist. This was not noticed during final assembly and did create a pronounced right turn during the first takeoff. There was plenty of control with the stick and Rudder to compensate, so the first flight was uneventful otherwise. It lasted 7/10 of a hour. I adjusted Aileron linkage to compensate for the right roll tendency, but may consider building a new one when time permits.

There are many other things that I could say that would probably help builders that are just starting, but this is getting rather long. I will send in some more things in the future. I do want to say how pleased I was with the service we received from Steve Bennett at Great Plains Aircraft. Our engine is nothing but first quality and was shipped right on time. Steve was most helpful during several telephone calls I made to him, and he gave very good advice on a range of questions. Since I'm not an engine professional, I was fortunate to have Steve Bennett and Tim Gibbs available to help me.

The Dragonfly is a wonderful airplane and I would like to build another one some day. I have several ideas that would improve the airplane. I am glad that you have taken up the cause to continue the newsletter. If any of the readers want more information on our plane, we would be happy to provide it. As we continue with our test program we will keep you all posted on the results.

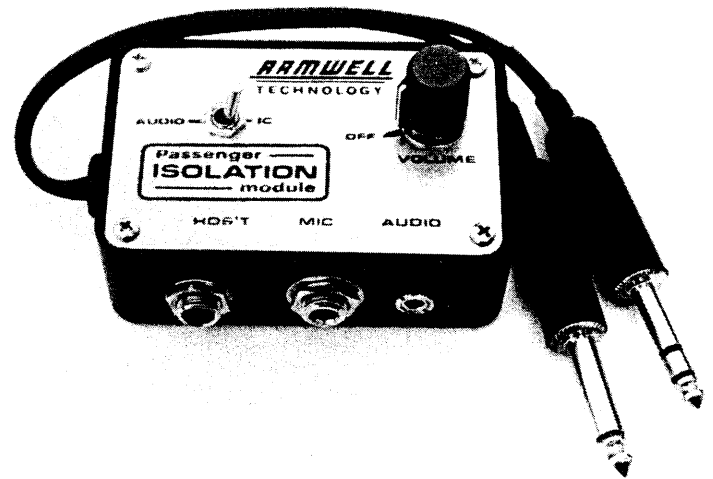
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NEW PRODUCTS

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The module operates in two modes:

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Dimensions: 2 1/4" wide x 3 3/8" long x 1 7/8" high

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(602) 955-8857

Rene de Lathauwer and Claude Canterbury have designed & manufactured this new intercom add-on. It is a item we can buy now and use in any airplane we fly. It took me a while to see the real advantages to PIM. When your flying cross country with another pilot in the right seat I don't think you would use the PIM very often because the other pilot will want to be involved or will be assisting in the flight. But where this is really going to be just GREAT is when you have your wife or one of the kids with you. My wife loves country music, I hate country music. Plus have you ever noticed how fast kids get bored, you know on a two hour flight, just as you are leaving the pattern they ask and then they ask every 3 minutes for the entire flight "when you are we going to get to Grandma's". Rene say's its a big asset for the passenger. I think it will save the Pilot-in-command a lot of frustration ! (Hooray! No more Kenny Rogers or Amy Grant) - Spud.

PUSHROD PROBLEM

Pushrod tube problem

In our last issue there was a article about Magnum style head (split head) pushrod tube interference by Ted Givens on page 9. I have spoken to Ted recently, he has had 3 people contact him and I have had 2 other people call and confirm this problem on their engines.

I think this merits a inspection by everyone that has these split heads (Scat style) and two piece pushrod tubes. This

inspection should be done as soon as possible.

Ted had mentioned in that article that the one piece pushrod tubes were available from Steve Bennett of Great Plains for \$13.95.

Great Plains Aircraft

P.O. Box 304

St. Charles, IL 60174

SUPPORTING VENDOR

We have a new Supporting Vendor, Radio System Technology inc. of Grass Valley, Ca 95945.

They offer a full line of kit avionics and accessories, which consists of audio panels, marker beacons, headsets, intercoms, 720 channel nav/com and more.

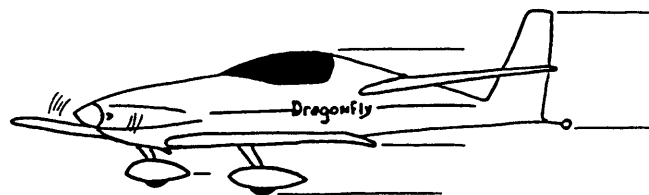
They also have done a tremendous amount of research in developing the proper way to install (embedded) Loran, nav/com and transponder antennas in composite airplanes. They have this reference text available for \$5.00 which should be a standard reference bible for anyone building a composite airplane. They also have their 16 page catalog available that is no charge.

Radio System Technology

13010 Loma Rica Dr.

Grass Valley, Ca 95945

(916) 272-2203



NEWSLETTER CONTRIBUTOR INCENTIVE PROGRAM

The winner of last issues incentive program is , Guy Evans of Visalia, Ca.

Guy has won a \$25.00 gift certificate from Sportys Pilot Shop. Congrats Guy.

THE ENGINE SHOP

By Chris Barber

Well fellow DFers, you may be gaining an appreciation for why we are doing this series of articles. Let's face it, engine problems will give an otherwise fine plane a bad reputation. The DF is an excellent match for the VW. The beauty of the experimental category is that we CAN do our own engines. This is why we are trying to convey to you the knowledge so you can make your own engine work well. OK?

Correction to the top-end article: Teflon buttons are not compatible with cast pistons. These have a recess at the sides of the pistons where the wrist pin goes through. This recess can allow the button to come out of the wrist pin. I have had good luck with forged P/C's which have no recess, but for cast pistons use the wire retainer or Berg's snap rings. Better still, don't use cast pistons.

This article will get us into our VW crankcase. This is our opportunity to machine the case for a mechanical fuel pump, a full flow external oil filter, properly finish the cylinder holes, and correct any main bearing journal distortion caused by the dynamic loadings inherent to the VW design. I do not support going to a hydraulic cam and lifters for an airplane, but this is the time if you are dead set for it. I personally get a warm feeling when I check my valve clearances and find that they have not changed.

Having the special tools at the onset will help save time. For disassembly: (*optional- a VW shop can do this for you) A pair of lifter retainers A steering wheel puller (used for the HAPI tapered prop hub) Flywheel holder 30mm socket to remove the flywheel nut * Crank gear puller * "Sears" large snap ring pliers

Begin by disassembling per the top-end article. Remove the accessory case and ignition. Wiggle the flywheel fore-aft. This is called end play, which will be set on assy. Measure the amount your engine had at teardown. Notice how easily the crank turns, but watch out not to bang the rods on the cyl holes. Don't try to remove the oil pump yet, it is pinched into the case. Leave the flywheel on for now. Remove ALL the nuts and bolts holding the case together. If your oil pump is held in with studs, remove the nuts, cover, and gears. Now take all of your screwdrivers and lock them up in a time-release safe. Get out your hammer (one of the few times you will need it, but here is why you have one in your tool box). You can get the oil pump out now by tapping on the side of the pump housing in the "remove" direction while you tug on it. There is also a puller available to do this. If your pump is held in by bolts, remove them and the gears and let the pump housing come out by itself when

the case is split. Position the case with the distributor side down with that side hooked to the stand. It will help if you put your cookie sheet below the engine to catch oil drips. Put the lifter retainers into the upper case half holes where the pushrod tubes were. You can see the lifters in the holes. We will lift the upper case half off the lower case half. Tap evenly on the three tabs that protrude at the case split line. This is why they are there, but be gentle because these cases are very soft. At the same time pull up on the cylinder studs. Do not get the screwdrivers out and pry the case apart or pound on the case studs if it won't come apart. If you are tempted to do this, stop and come back later. Check instead for nuts not removed or the oil pump body still being in (stud mounted). A new case is \$300+. Set the case half aside and wonder at the simplicity of the engine. Also put the lifters from the half you just removed into an egg carton or other holder so they can go back into the same hole. The crank and cam are timed via marks on the gears which you can now see. Notice the position of the distributor drive shaft slot when you have the #1 rod (pilot side rear) at TDC position. Remove the flywheel/crank/rod assembly and set aside, standing upright on the flywheel. The flywheel laying flat on the bench makes a good holder for the crank. Remove the cam and lifters an place in the storage place for replacement back in their locations. Slide out the dist drive shaft, watching out for the washers at it's base-don't lose them or mix them with other washers. Note the rod numbers at the rod cap split line. If they don't have any, put your own on each half of the rod on the side next to one of the bolts. The nuts may have been staked in place. Remove the nuts, separate the rods (put away that screwdriver!) and remove from the crank. Remove the prop hub with a press or with the steering wheel puller, not your hammer. If the hub is easy to remove once the bolt is taken out - it is a sign of big trouble. One "aircraft engine" I own did not have a tapered hub, it slid off with no puller. On the other hand, the 1835 HAPI tapered hub was a bear to remove. I like the hard to remove style myself. The gears will come off after removing the snap ring. This snap ring is easy to get on/off with the proper pliers and almost impossible without them. You must use the VW gear puller to get the gears off. Pull the gear, spacer and brass gear all at once. You may choose to pay to have these removed. Removing the flywheel nut is easiest with an impact air wrench, but make sure that it is set to loosen. The flywheel can be removed by holding the crank by the rearmost journal just above the bench and evenly striking the flywheel with a rubber mallet. Sacrifice a 1/2" chisel by grinding the point into a curved-end big screwdriver to perfectly fit the big slotted end plug(s) on the bottom pass side of the case. Use a wrench on your new tool to remove the plug(s). Now remove the spring(s) and piston(s). These control your oil pressure and cooling. Don't be surprised if the pistons are hard to get out, and DON'T scratch the bores of the cavities the pistons ride in.

The engine parts can now be inspected. I would suspect the bearings look pretty ratty if you did not have an oil filter system. Those oil pistons are probably scratched also. Look at the case around the studs adjacent to the #2 (split) crank bearing. If there is any sign of relative movement here (ie no machine marks still showing), and unless you have a counterweighted crank there probably will be, this indicates that your crank was flexing. We will call this case shuffle for lack of a better term and discuss it later. Measure the crank main and rod journals. How smooth do they look? Can you feel scratches with your thumbnail? If smooth and in tolerance for STD or .010 (.25mm) under, then the crank is OK to re-use after polishing the journals with crocus cloth. Try holding it up by a cord tied onto the hub or flywheel or bolt and ringing it with a light blow from your steel hammer onto a NON-MACHINED surface. It should ring like a bell. A thud is a bad sign, it probably indicates a crack or a poor quality crank. If you are rich, get it magnafluxed or penetrant inspected. The rods wear at the small end bushing, and will probably require exchanging for rebuilt ones (or getting rebuilt if they are balanced already). The cam lobes should be about the same size. There should not be any pitting on the lobes or the lifter faces. Take two lifters at a time, put the faces together and hold up to a light. They should be slightly convex and be able to "rock". I would expect some wear patterns on the crank, cam, and dist shaft gears. Unless these look real rough they are OK.

Back to the case. The "shuffle" observed is due to the dynamic forces distorting the crank, causing the case halves to work against each other. Look at the crank throws and it is obvious why. This also distorts the #2 bearing cavity, causes the rods to flex, pistons and rings to wear, and in extreme cases the piston pin retaining clips to come out. The higher the RPM, the worse it gets. For us at 3500 RPM, the effects should be minimal but are still found. My HAPI 1835, with 60 hrs on the Hobbs, had shuffle. There are two ways to handle this situation. The cure is a properly counterweighted (C/W) crank. These weigh about 8 lbs more however. I think that Herr Limbach got around this by rearranging the crank throws, judging from their firing order. C/W cranks of various levels of quality are available. Don't use a welded or cast crank in your airplane engine. Another solution can be found which really only masks the symptoms. This is what I have chosen to do my ex-HAPI. I had the case modified to resist the loads imposed by the un-C/W genuine VW tapered crank that came in the 1835. This is done by adding tubular "shuffle pins" to the #2 bearing split surfaces, straddling the case stud. The case was then align-bored to bring it back true. This is not as desirable a solution as a C/W crank, but was chosen when weight, RPM, and cost were considered. Berg hates align boring and these shuffle pins. If you don't have to align bore to round up your bearing journals, don't. While the case was out for machining, I had the cylinder holes faced to give a good

surface for my spacers to seal on and even-up the distance from the cylinder sealing face to the crank centerline. The case was modified for full oil filtration by having a oil return hole drilled and tapped into the oil galley that goes out of the pump. The pump body exit hole was also plugged. All these modifications were done by Rimco after I removed my cylinder studs. If you may possibly install a bigger crank and have to UPS your parts, get the case clearanced now. The case was also modified at a different shop to accept a side mount mechanical fuel pump. More on the pump in a separate article, but let me just say for now that the pump set-up was in need of further development.

You will now be at the cleaning parts, sending parts out for rework, and ordering parts stage of the operation. You will need new cam, crank, and rod bearings. Rimco will supply the main bearings with an align bore. Ask (beg) for German bearings. The cam bearings have a thrust shoulder on one of the bearing halves near the gear. Get the copper faced double thrust ones Berg sells. If you get a new cam, also get new German lifters. The rods should be exchanged with a quality supplier if the small end bearing is worn. Rimco's rods are even length. Get the rods balanced. Better still, have the whole engine balanced. A little planning beforehand can save some UPS charges or driving. Since you are putting in a full flow oil filtration system (aren't you?), you need a filter. I have a 5 1/2" Oberg 3 micron cleanable filter and love it. Too bad it is somewhat heavy. A Fram HP-1 is the only other filter I know of that can be relied on not to burst. You will need a oil pump cover to get the oil out of the pump, since the pump exit was blocked. I like Berg's cast iron one with pressure relief, but never had any trouble with a non-pressure relief aluminum one running on a large cast iron Melling pump, even in cold weather. The cast iron pump is heavy. Berg sez to use a stock VW Aluminum pump that has been hard-anodised. This would be the lightest way to go.

In the next article we will assemble the engine. Spud is pressing for space so we had to do it this way. A future article(s) will address increasing the power. Let's get some input from you guys on this. I am using a longer stroke crank and other goodies in my own "Magnum" (Is anyone else getting tired of that name?). This topic will be deferred until I have resolved putting a prop hub on that will allow me to interchange this engine with the 1776. While on the subject of hubs, GPASC has pointed out that I did not mention their technique of "deep drilling" the crank to allow the use of the taper hub (sorry Steve). This is explained in their catalog and has been used on stroker engines. I have no experience with these, but I personally like the idea of the full length taper better.

Chris Barber
Huntsville, Alabama

Multicom continued. . . .

1982 DF Swarm-in at Eloy, MK II taped by Rene de Lathauwer on the ground and fly-bys set to a music background, copywrited program.

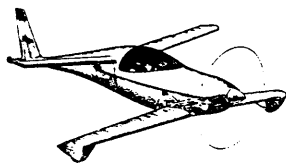
1986 (?) DF swarm-in at Eloy, Taped by Tom Sulas, MK II

If anyone would like to have the above collection please forward \$6.00 to cover the cost of the tape and postage.

Rene de Lathauwer

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Phoenix, Az 85016



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For Sale: I have a hodge-podge of pieces, 1- Task fuselage, painted and flown 78hrs, complete with both cowls, rudder, vertical fin, Hapi engine mount, panel, controls, etc. missing canopy. A painted and flown canard with balanced long elevators, no landing gear. Task mains for tri-gear. A Hapi VW 1835 freshened at 72hrs. Will take reasonable offers on all or pieces. Contact Mike Quigley (915) 751-0228/ 584-7578

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For Sale: 1 roll of original Hapi Tri-Ply, enough to do 1 canard or wing - \$160.00, 1 - 250 foot roll of carbon fiber (original) - \$230.00, Hapi brake pedals - \$30.00. Spud Spornitz after 7:00 (913) 764-5118.

Wanted: Would like to purchase a completed Dragonfly Mark 11. contact Reg Clarke, Box 7107, Westaskiwin, Alberta T9A 2IY (403) 352 0017

Wanted: I am interested in purchasing a completed or near completed Dragonfly. Please contact by mail. Steve Brand, 850 Hollywood Blvd., Hollywood, Fl 33019

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