



**DRAGONFLY
NEWSLETTER**

Dragonflyer



27 FALL

**SUBSCRIPTION PRICE \$15.00 A YR. U.S., CANADA AND MEXICO
\$20.00 A YR. ALL OTHER COUNTRIES**

OSHKOSH BOUND AGAIN

About the time you receive this newsletter I will be in the air eastward bound on the annual pilgrimage to Oshkosh.

This will be the seventh consecutive year that the faithful old Prototype has made the trip to Oshkosh. The Prototype now has over 1600 flying hours on it and though beginning to show a few nicks and wear marks, is still a good and faithful bird that I believe still has a lot of hours left in it.

We debated about prettying it up for Oshkosh, but there wasn't time and besides, we don't consider the Prototype to be a show plane. It is a working tool that gets flown an awful lot on customer demo rides, Dragonfly builder check-outs, and just plain pleasure flying for myself and any other reason that we can come up with that can be used as an excuse to go flying.

The Prototype will not be on the flight line this year as is usual, but can be seen in the new aircraft display area that is just north of the main exhibit buildings and just east of the forum tents towards the runway. We will have the Prototype Dragonfly there as well as a nice display of our new Magnum series engines including one of our new two-cylinder HAPI Hornet engines. This is in reality 1/2 a Magnum or a little two cylinder Magnum that there has been a

lot of pressure on us to build. We hope that there's as many people anxious to buy the things as there have been twisting our arms to build a two cylinder engine.

That's where we'll be located. We hope that every one of you Dragonfly builders will come buy and spend a little time with us. We'll have a cool place to sit down and it should be an easy place to talk and converse and help you out with any building problems you might have. I looked over that area last year and watching the other merchants like ourselves there, decided that would be a nice environment to meet the customers in. I hope you can come there and visit us and look over the new goodies.

We are going to try to set up a Dragonfly builders meeting Sunday night at 7:00. I don't know where it will be yet. Possibly on the grounds there at Oshkosh, or possibly in a local restaurant, but if you come by the tent anytime before Sunday night, by the time the convention starts we'll have that tied down and we'll be able to give you that information. We'll also have that information out on the flight line near the Dragonflys.

I had a phone call from Bob Walters and his wife, Ching, yesterday. Bob is back flying for TWA and has bid his trip schedule to leave him some time to be free to come to

Oshkosh. As of the telephone conversation, the scheduling had not been confirmed, so he's not certain whether or not they will be at Oshkosh, but they are making every effort to be there. Hopefully, we can reunite some of you builders who have been in it for a long time with Bob and kind of bring his input up to date. A little later in this newsletter you'll find a little article that my wife wrote for the local newspaper concerning Bob. I think you'll find it very interesting.

UP-DATE: NEW ELEVATOR HARDWARE

As reported in the last newsletter, we have totally redesigned the elevator control system to eliminate the possibility of slop in the control system that can lead to elevator flutter if all the circumstances are right.

We have gotten rid of all the tube inside of a tube joints where we are dependent upon a bolt to transfer the torque load. We have installed this system in two airplanes now and have quite a few hours of "in flight" time including some flutter testing in Justin Mace's airplane.

The new system uses a 3/4" diameter elevator torque tube, required two new flat metal fittings, namely the elevator torque arm and the elevator control arms. We sent out a purchase order to have dies made to stamp out these two pieces and we are promised six weeks delivery which would put the pieces in our hands very shortly after Oshkosh.

At that point in time, HAPI will have the control system available to you in the form of drawings, stamped metal parts or completely prewelded assemblies for those of you who don't want to do any welding. This price on the stamped metal parts and the prewelded elevator control assemblies will include \$10.00 for the drawings, but we will of course credit \$10.00 to those of you who have already bought drawings before the parts were available.

The new system has several advantages. I believe it is easier to build, install and certainly a whole lot easier to maintain. There's very little possibility of slop entering the system because we've eliminated all those troublesome joints and it does allow you to remove the elevators from the airplane without removing the canard from the aircraft first.

BACK ORDERS

We have had some serious problems in the past few months in supplying certain of the unique parts on Dragonfly such as the spinner.

As many of you know by now, Monnet was bought out a year or so ago by Inav, which has now gone bankrupt and is no more.

The Prototype Dragonfly had originally used a Sonerai spinner and Bob had paid Monnet for the extra tooling to create the special back plate and front bulkhead required to convert it over for Dragonfly. When Inav went bankrupt, our source of supply dried up, but through the grapevine, after a period of months, we were able to find the person who had actually made the spinners for Monnet, had the tooling in his possession and by the time you read this newsletter, we will have spinners in stock again.

Another area that has been a problem is the Mark II landing gear legs. Our supplier on those did have a lot of parts requiring unidirectional glass in production in his facility and it was easy to add the landing gear legs to the production schedule since they used the same material as some of the parts that were already being run. Unfortunately, the supplier lost his contract for the other unidirectional assemblies and now the Dragonfly gear legs must be done as a special run.

The material the gear legs are made of can only be bought in big quantities, it's prepreg with a limited shelf life. Consequently, we have to buy gear legs ten sets at a time and even after we place the order our supplier then has to order the special glass which is made on the east coast and the glass manufacturer may then give them a six or eight week delivery schedule. It then takes them a month to six weeks to get the parts over to us and then that results in everybody having to wait a long time.

Why don't we just stock a lot of these things? Well, really the answer is quite simple. It's a matter of money. We do have a lot of parts in stock. Like I've got all kinds of brake hardware for the mechanical brakes in inventory. We've now got a lot of now obsolete elevator control system hardware and a lot of other odds and ends in the stockroom that we'll probably never sell. We carry at any one time over \$100,000.00 worth of inventory and I would imagine probably \$20,000.00 worth of that stuff in the stockroom now is dead stock that we'll never be able to sell. So in order to stay in business we have to practice good business practices just like General Motors and Chrysler are doing now in not carrying a big inventory for the simple reason that we can't afford to get stuck with these parts when, for whatever reason, they do become obsolete.

We are gradually evolving into pretty much a custom built business simply because that's the way it has to be if we are to stay in business and staying in business means showing at least a modest profit.

You builders should pay careful attention to the price sheet with your HAPI catalogs. Preceding many of the stock numbers are little boxes that might have, for instance, a 4 in the box. That means that we need four weeks lead time to make that particular part. What we would strongly suggest to those of you who are building along steadily and will need a particular part at a particular time is order it way ahead of time. You don't necessarily have to put any money on it, just order it so that we can get it into the schedule and know what we have to build.

There will always be, I'm sure, back order situations that nobody can predict. One of the problems in the aircraft business is simply that an aircraft is composed of a lot of parts that are unique, many of them having only one manufacturer or one source and when that source puts you on back order there's no alternative to turn to. The source may not be delivering because some little part or material necessary to make the item he's got you on back order for is unavailable to him for some reason.

A good example of this is the "Hall Effect Sensor" that we use in our electronic ignitions. The little parts don't cost much in quantity. I believe they are only \$1.28 each when we buy them in quantity. There has been no shortage of them in the past, but just recently when we placed an order, Sprague Electric quoted us a six month lead time on delivery, which would have put us out of business at least in electronic ignitions. We made a lot of phone calls and turned over a lot of rocks and for whatever reason, Sprague was able to supply us in two months rather than the projected six months, so we passed that hurdle.

From day to day we never know when something that has been available instantly in the past might become a shortage item in the future. We do the best we can and would greatly appreciate it if you guys will order early and bear with us and please be tolerant when we can't supply something because we are in a back order situation. We're in the same boat you are. We can't make any profit off of it until such time as we can supply it, so we're not going to sit on our hands and not supply it because we like to do business that way. We just occasionally get in situations that we can't control to our own liking.

THANKS GUYS FOR YOUR CONCERN

As was reported in the last couple of newsletters, 25 and 26, I had been having some problems with my tummy and wound up with a terrible case of hiccups that lasted about five days. Had to take some potent medication to settle the problem down. Stomach convulsions they're called. But anyhow, I'm pleased to report that the tummy is back on line and in good shape now and I'm off of that particular medication and back flying again.

Many of you sent in cards and notes attached to your correspondence asking about my health and expressing your concern and I want you to know that I'm deeply grateful for that and appreciate it very much.

Over the years of involvement both with HAPI engines and Viking Aircraft we've had the opportunity to meet literally thousands of homebuilders all over the world. Taken as a group, I don't think there's a better group of people anywhere in the world than the group of homebuilders that we have dealt with. We have made some wonderful friendships over the years and looking back on ten years of being in this business, I think that those friendships, the enjoyment we've shared are truly a thing of lasting value that transcends business, money, airplanes, or any other consideration. Thank you my friends. You are a great group of people.

COVER PHOTO

Art Stanwood of Virginia Beach, VA, sent in some pictures and a letter concerning his Mark I Dragonfly which we'll print the major portion of here in this newsletter. About half of Art's letter concerned a cracking problem he's had at the juncture of a tail skid and the layup brought on most probably Art feels by too much sanding in the finishing process going through the glass and weakening it in that area. This is an area that takes a lot of stress and should be very carefully dealt with during the construction process to be sure the design strength is indeed there. Here's Art's letter:

Dear Rex,

At long last I am sending a photo of my Dragonfly. I started the project in Jan. '81 and first flight was in the summer of '85. In the middle of all that time was crating the whole thing up in two 4 X 4 X 24 ft. boxes and sending it to Puerto Rico so I could finish it. I conducted my flight program in the sunny skies of Puerto Rico and when it came time for me to transfer

back to the states, I talked the Station Air Operations Officer into bringing it back to the U.S. in a C-130. So my Dragonfly has two long overwater flights with noone in the cockpit!

I am flying a lot, about 80 hours so far, and having fun. There has been a lot of frustration getting the engine to run right. I regret buying Gil Duty's engine. I just don't have a lot of confidence in it. Seems like something is always going wrong.

Anyway, Rex, I hope to fly to Eloy this year or next. Thanks for all the help you have given me.

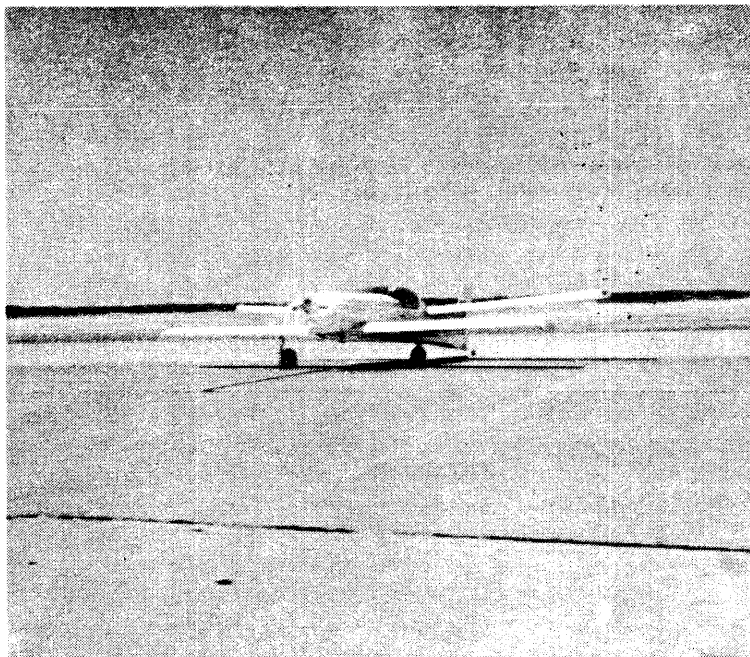
Art Stanwood

Received a short note and photo from Bob Kennedy of Chico, CA.

Hi Rex,

It flies. Still need some trim work and engine adjustment, but it's pretty easy to fly, comfortable and I like it.

Sincerely, Bob



FINISHING YOUR DRAGONFLY

We get several phone calls a month from builders asking what finishing technique and materials we recommend as the easiest way to finish a Dragonfly out and get it painted.

I don't believe that my son, Patrick, and I are necessarily experts in the Dragonfly finishing department, but we do a pretty doggone nice job and we've tried an awful lot of materials on different projects at different times, so have had a chance to evaluate a lot of different brand names and such, most of which are pretty good, but most of which have one or more drawbacks.

I personally don't consider sanding and finishing an all composite airplane to be a

real fun chore. It gets to be hours and weeks and sometimes months of hard work to get that beautiful, smooth, molded in one piece look, but I can tell you the easy way, in my opinion, to do it.

A good finish on a composite airplane starts in the building stage. In the case of the flight surfaces the smoother and better your foam cores are before you put the three ply or the 7715 layers on it, the smoother the finished glass part ready for primer and paint is going to be. Consequently you will use far less filler and primer and much, much less elbow grease to get it ready for that final coat of paint.

Don't hurry! Take your time and really work those cores down until they're super smooth before you do lay-ups on them. After you get the structure laid up, let's assume we're going to finish a canard, the first step that we do is to lightly rough sand it just to knock off anything that's sticking up above the surface. We never sand so much that we get into the weave of the cloth and start cutting any of the glass fibers.

After the first rough sanding, we smooth on Micro Putty using a one inch wide strip of banding stock like a screegee except that we bend it to follow the contour of the airfoil and it will deposit micro in the low spots and scrapes it off of the high spots. We fill the lows, sanding between micro applications until we've got a nice smooth wing. You'd be surprised how little effort it is to get it pretty doggone smooth. Then we go back and my own system is to mark an "X" with a black felt marker pen on the high spots and I make a circle around the low spots. Then we take micro and just fill the low spots and don't bother the high spots. Keep repeating this process until the flight surface is very, very smooth. The same procedure is used exactly on the fuselage for that matter. When you've got all the humps and hollows smoothed out with the micro, you're ready for the first primer.

We use Safety Poxyl II and the glass beads to make the micro. Several builders have said micro was hard to sand, loads up the sandpaper. Now that indicates to me that the micro is not completely cured. Being here in the desert sun, we've found a little trick that we use. We let the micro cure until it is hard inside, then we take the wing or canard out and set it in direct sunlight for about an hour. The combination of heat and ultraviolet really kicks off the epoxy so that it can be sanded with very little effort and it will not load up the sandpaper. We are at this point in time dry sanding. Finish up through dry micro by dry

sanding, finalizing it with 320 grit paper. We then spray on a fill coat of Stits Feather Lite which dries very quickly and we dry sand this using a full size sheet of sandpaper backed up with a half inch thick piece of high density polyurethane. We attach the sandpaper to the urethane with spray contact cement available in stationery stores. The purpose of the backing block is so that you can put both hands palm flat on the top of the sanding block and it again averages out, it'll knock down the high spots and won't touch the low spots.

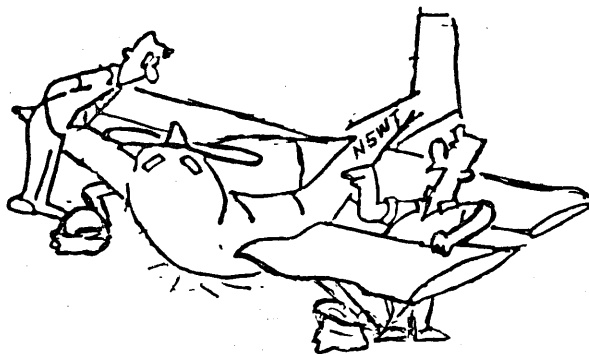
Spray on Feather Fill, dry sand it, then spray on another coat until you have the surface finish you want. Then spray on another light coat and wet sand it with 400 grit sandpaper before applying the first color coat. We strongly recommend that you use Stits Aerothane Aircraft Finish. It will produce a beautiful high gloss, wet look finish, and they have a tremendous range of colors available. It covers very well and the net result will be a beautiful finish on your airplane that hasn't added nearly as much weight as many of the other finishing systems we have tried.

Some say that the Stits material is expensive. The Feather Fill compared to other fillers is about the same price. The Aerothane seems a little expensive, but you don't use nearly as much of it, so in net effect, I believe it's actually cheaper to go the Stits Aerothane route than some of the other finishes. One of the big advantages of Aerothane is that it was designed for airplanes that have to sit outdoors and it's a very elastic finish that can move and stretch on a part that has to bend a little bit without crazing or cracking in the long term. Try it! You'll like it!

Another real asset, I believe, in using the Stits finishes is that the Stits people are there for product support and you can get them on the phone and they can tell you exactly how to use their products in the right manner. Ray Stits has designed a lot of airplanes, is an old time homebuilder, a fine gentleman, puts out some really good projects which he stands behind. I've found by experience that if you follow the instructions that come with his products to the letter, they work really well.

OSHKOSH FORUMS

HAPI Engines, Sat. Aug. 1, Tent 2, 10:15 to 11:30. Dragonfly, Sun. Aug. 2, Tent 3, 10:15 to 11:30. NASAD, Mon. Aug. 3 Tent 4, 11:45 to 2:30. Cygnet, Tues. Aug. 4, Tent 8, 2:45 to 4:00.



...so, to humor my wife, I put in the color weather radar, the side-looking radar, the Loran C and the telephone....Pooooof!

ADJUSTING HAPI DISC BRAKES

I had a call from a builder a couple of days ago who was having problems with the disc brakes popping the seal rings out and after talking with him, it became obvious that he wasn't adjusting them properly, so perhaps a little clarification of how to adjust them is in order.

The brakes are furnished with several brake adjustment spacer washers and shim washers .015 in thickness. The shim washers are used to adjust the spacing between the disc and the brake lining.

To find the initial adjustment, put on enough spacer rings and washers, then the inner tapered roller bearing, the wheel, the outer tapered roller bearing and screw on the axle nut and bring the bearings up to the proper pre-load Turn the wheel. If the wheel turns freely, you must remove some spacer washers. If it's bound up against the disc against the lining you have to add some spacer washers.

Let's assume it turns freely. Try and determine visually approximately how much space there is between the brake disc and the lining. We don't want more than .015 or the thickness of one of the thinnest spacer washers. If the wheel turns freely, start taking spacer washers out one at a time and reassembling it with bearings, wheel and preload with the axle nut, until you reach the point where you have taken out one too many spacer washers and now the disc is up against the brake lining. You then add one .015 spacer washer and it will give it enough clearance for the wheel to turn freely. There should never be more than .015 space between the disc and the brake lining. In other words, one thin spacer washer should be the difference between the wheel turning and not turning.

Finding Out New Things About Old Friends Draws Them Closer

By PHYLLIS TAYLOR

People never cease to amaze me, especially people who are my friends. We tend to hang labels on our friends. This one is kind, that one is a hard worker, the other is good to have around when things are rough and so on. You can know a person for years and think you know them so well and then just like meek, mild Clark Kent they will step into a telephone booth and come out a "Superman!"

As readers of this column know we own an experimental airplane called the Dragonfly. We bought the rights to the Dragonfly about the time we moved to the Eloy airport. We bought it from the designer Robert Walters. He impressed me as a talented man both as a designer and a pilot. To top it off, he is a nice person. Over the years a real friendship grew between Bob, his wife, Fearless Leader and me.

I had Bob labelled as a nice guy, flight engineer for TWA, builder of a couple of experimental airplanes, deep water sailor and friend. Well, last week was quite an eye opener! Fearless Leader was a witness in a trial up in Phoenix. So was Bob.

As what is called an "Expert Witness" both Fearless Leader and Bob had to give their back-

ground and qualifications. Fearless Leader didn't tell anything I didn't already know but Bob sure did.

I knew that he had been in the Navy. He learned to fly at Pensacola, Fla. He flew 157 missions from the aircraft carrier Ticonderoga. Was awarded so many medals for bravery in battle, it was hard to count them all. Got out of the Navy and spent better part of four years in Iran teaching the Iranians to fly F14 jets while he was an employee of the Grumman Aircraft Company. He came home to go to work for TWA.

In passing he told the court that he went to the Navy's prestigious Fighter Weapons School at Miramar Naval Air Station outside San Diego, Calif. He said he graduated in the top half of his class and later was an instructor at the school. A quick poke in the ribs from Fearless Leader let me know that I missed something.

"What kind of school is that?" was the next question asked of Bob. Bob chuckled and said "Oh, it's the Top Gun school, but I don't remember any beautiful female Tactics Analysts like the one in the movie!"

Looking at Bob today you see an average 'people.' Bob is pushing 40 pretty hard. Hairline slightly receding and his hair is getting

grey. He is caring more weight than he did when he was at the Top Gun school. But the skills he acquired in flying are now used daily for TWA flights.

The airlines do their best to grab the military pilots when they return to civilian life. (Wonder if he ever gets the urge to do a loop-de-loop a la fighter pilot in his 747?)

Bob's wife, Mary, called us about two or three days after the trial to tell us something she had just found out after being married to Bob for over 15 years. He had a secret.

She was going through some old papers of Bob's and found a picture of Bob getting an award. "Hey, Bob, what are you getting an award for in this picture?" This was the moment that "Superman" came on the scene!

"Well," said Bob, "I received the award for being the Top Gun." Mary told us that she knew that her husband was a pretty good pilot but to find out he's good enough to be 'Top Gun' overwhelmed her.

Having just seen the movie *Top Gun*, with its very realistic flying sequences, to say that we were impressed would be the understatement.

Add to this achievement, a degree in aeronautical engineering, aircraft designer and test pilot and you have someone who sets goals and accomplishes them.

In a time when heroes are in short supply, I'm glad that I have the privilege of knowing Bob.

The problem out in the field is apparently that guys are adjusting them with far too much space between the disc and the brake linings. The builder I was talking with said he was allowing .100 or 1/10 of an inch there, which is far too much and allows the seals to extrude out of their grooves when the braking pressure is applied. The problem was that he had about six times as much clearance as the maximum allowable in the system.

Even with as much as I fly the Prototype Dragonfly, I find that I only have to remove about one spacer washer per year at an annual to compensate for wear on the linings. After three years of flying, I'm still flying on the original set of linings, so it's safe to say that you can probably get a thousand hours of flying out of one set of linings.

DRAGONFLY SWARMING

We have established October 9th, 10th, and 11th as this years dates for the Dragonfly Swarming. We had formerly had it in the latter part of October, but several people indicated that the earlier part of the month might suit their schedules better than mid month. e CopperState Fly-In will be going on in Casa Grande, weekend following our get-together so it looks like this weekend is the best one.

We're going to have some 'hands on' this year about aligning a Dragonfly and getting it all set up ready for flight. We're going to concentrate on how to do a flight test program on the airplane without exposing yourself or the airplane to any undue risk.

We'll talk a lot about maintaining your Dragonfly after you get it flying. We expect to have several Dragonflies here again this year and as in the past, we'll be giving rides and having a lot of fun.

The whole roast pig, chuckwagon style dinner went over so well last year that we intend to do that again. So bring your wives, hop into your Dragonfly and come to Eloy! We're looking forward to having a very good time this year.

We need to know how many are attending for the dinner, so please get your reservations in early. Reservation forms are enclosed.

GERMAN PILOT CHECKOUT

I've been giving a pilot check out this morning to Gotthilf Groezinger in the prototype. Gotthilf has got about 200 hours and flown several different kinds of aircraft. We flew about a half hour and he seemed to have things pretty well under control even though he had a little trouble getting into the Prototype. He is a big man.

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His Dragonfly will be flying very soon and he reports to me that two other Dragonflies in Germany are very near the flight stage.

Gotthilf has had to fully proof load his airplane to satisfy German regulations and he will be sending me some pictures and the details of what they have to go through before they can put an experimental aircraft in the air. It's a whole lot more involved procedure than here in the United States and I think their proof loading is just more proof that the design is quite adequate. It has passed the proof loading over there very nicely. More about that in the next issue.



DRAGONFLY LICENSE PLATE

Marc Augustine of Everett WA sends us the above photo. He's advertising that he's a Dragonfly builder while he's driving. We at Viking are impressed with his enthusiasm for his project. Thanks for the photo Marc!