

The original idea for a parasol wing version of Fly Baby was to use a swept-back wing attached to the biplane center section. Without running an actual weight & balance study, I knew that this would require a lot of sweepback on the wing. When one of the other homebuilts, the "Jungster" (quite similar to a scaled-down version of the Bucker "Jungmeister") tried the same thing, the wing sweepback was extreme. This kind of wing on Fly Baby wouldn't have an appearance that anyone would want. The major advantage of the swept wing was to have the center section ahead of the cockpit so that the pilot could get in and out more easily, and have better upward visibility.

One look at the monoplane "Jungster" convinced me that the parasol Fly Baby would have to be a straight wing. This offered a couple of advantages in that standard straight Fly Baby wings could be used or straight wings from other lightplanes could be used. My original intention here was to use the stock 13 ft. Fly Baby wings fitted to a center section. This would make it possible to switch back and forth from a parasol to a low-wing. When someone else who wanted a parasol version called and asked me if a wing Luscombe wing could be used, I did some checking and found they could.

Using these wings, no center section is required. They will join at the centerline pretty much as on the Corben Baby Ace. Since the Luscombe ailerons are worked by cables, the control hookup will be different than for the center section version using stock Fly Baby Wings.

The main disadvantage of the straight-wing parasol, of course, is the job of squeezing under the wing to get into the cockpit. On some other parasol designs, like the Smith Termite, "big" builders have raised the wing some to improve the access. Moving the wing up introduces other problems, so the answer in the case of Fly Baby is to cut a drop door in the side of the fuselage. Fortunately, the arrangement of the diagonals permits this. A little weight penalty involved because other pieces have to be put in to serve as anchors for reinforcing the plywood skin on the inner side.

So, scout around and see if you can find some cloth-covered, two-spar Luscombe 8A wings if you prefer to go that route. If you prefer to use the regular Fly Baby wings, it's easy to go that route too. Just let me know and I'll do some sketching.

Thanks for sending a stamped envelope. You'd be surprised how few people are this considerate. While one stamp doesn't sound like much, and isn't, it adds up on this end of the line where I get several dozen requests/letters a month. (end of letter)

ANOTHER FIRST FLIGHT

In the same mail with the above letter, Pete also sent us news of another new ship in the air. Here is his report of the event.

DON ENOCHS of Seattle got his new Fly Baby into the air Sunday, March 24, 1964. Since Don is only a 30-hour Cessna-type pilot so far, he got a friend, ROY BARKER, to make the first flight. Roy took it up for 20 minutes while I flew chase plane with 500F and took some pictures. Then I took it up for about half an hour for some careful checking. (con't on page 10)

"FIRST FLIGHT" (con't)

Works fine. Stall breaks straight ahead, control response good. Performs just like a Fly Baby should. Not quite a "hands off" ship yet, however. While the weight and balance puts it just a shade on the tail heavy side of center, the nose drops when the stick is released. Needs to have the leading edge of the stabilizer lowered about 1/4"

MORE ON THE DR. AUGUST RASPET AWARD

While we are on the subject of PETE BOWERS, this is as good a place as any to pass on the information promised last time on how to help in getting him named for the Dr. Raspet Award.

All it takes is a letter to the Board of Directors, Experimental Aircraft Association, P.O. Box 229, Hales Corners, Wisconsin 53130, telling them that you think Pete has earned this award and that you would like to see him get it.

May we suggest that you get a letter off right away as Rockford is only a short time away and the decision will have to be made soon by the "powers that be". We all owe Pete a great deal and this may be the only chance we have to show our appreciation. Don't put off writing till it's too late, because it is going to take all of us pulling together to swing it. EAA is a big, big, organization and it a lot of effort to do something like this. ('scuse please, left out "takes" in that last sentence and can't correct it. For what it's worth, this is being typed at 1:45 a.m.)

"ON TO ROCKFORD!"

Last year saw at least 50 builders, and would-be builders at Rockford, that we know of. That many showed up at our little impromptu "forum" at ERNIE HARBINS tent. This year as you will note in a letter from PAUL POBEREZNY elsewhere in this issue, we will be allotted time in the big tent for a "formal" forum. Pete of course plans to be there and he has hinted at the possibility of bringing Fly Baby as a biplane. Naturally we are looking for a lot more new Fly Babies to show up this year as well as the "old standards" of past years. These are just some of the reasons that this will be a good year to go to Rockford if you ever plan to go. Pete only makes it every-other year on even numbered years and won't be there next year. Although we were there last year, we will probably follow the same schedule in coming years.

So, if you were, or are, still undecided, this is a good time to make your plans. If enough of us show up, we could turn the evenings into some "hangar flying" sessions to end them all. Think it over.

If you are planning to be at Rockford, or are even considering it, how about dropping us a line and saying so. The idea is to make up a sort of roster of who we might meet and possibly get some guys in touch with each other on similar ideas. This way the biplane builders, two-placers, aerobatic types, etc. could hold their own "sub-forums" on a particular phase of building. We, for our part will be glad to coordinate such meetings as much as possible and maybe post the times and places on the bulletin board or announce it on the P.A. system. Whether or not we do it will depend on getting enough response to justify the effort.



EXPERIMENTAL AIRCRAFT ASSOCIATION

An International Non-Profit Organization Dedicated to the Advancement of Aviation Education, Homebuilt Aircraft and Private Aviation

OFFICES & AIR MUSEUM: 11311 W. FOREST HOME AVE., FRANKLIN, WISCONSIN

Paul Poberezny, President Ray Scholler, Vice-President S. H. Schmid, Secretary Arthur Kilps, Treasurer Audrey Poberezny, General Manager

PHONE 425-4860 AREA CODE 414

POST OFFICE BOX 229, HALES CORNERS, WISCONSIN 53130

May 7, 1968

Hayden Ferguson
114 White Drive
New Albany, Miss 38652

Dear Hayden,

I received the latest Flybaby Bulletin and want to congratulate you on an excellent job of presentation. There is a lot of valuable material in the bulletin which can aid all aircraft homebuilders. In looking to the future, it would be real nice if we could use some of this material either in Wood manuals when we up-date our present one, or SPORT AVIATION.

If we could use any of this material or your photos; I would be very pleased as it would serve a useful purpose.

Also, thanks for your letter regarding Pete; it's going to help. I received a nice letter from Pete the other day and he plans on being at Rockford and I would like to see him hold a Flybaby Forum. We can allot the time in the Meeting Tent. You might pass the word to the fellows. We could have a very good meeting which other wood builders should attend.

Your friend,

PAUL H. POBEREZY
President

PP/p

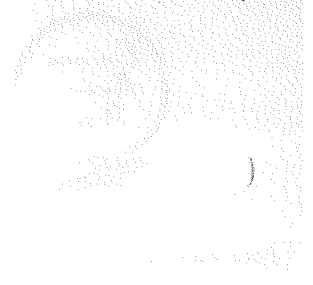
The "Fly Baby" Bulletin
Page Eleven, March, 1968

DIRECTORS: — Harry Zeisloft Val Brugger Chet Wellman Martin Haedtler Don Hart Robert Gyllenswan Robert Wales

SPORT AVIATION PAUL POBEREZY RAY SCHOLLER LEO J. KOHN CLAYTON KING
EDITORIAL STAFF Editor Assistant Editor Assistant Editor Advertising Manager

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WARRIOR BROTHERS



LETTER FROM EAA PRESIDENT

Page eleven of this issue is a photo-copy reproduction of a letter from EAA President, PAUL POBEREZNY and is self-explanatory.

Naturally we were quite flattered to receive such a request from Paul and hasten to say that anything appearing in the Bulletin may be used in any manner he sees fit. To see anything from the Bulletin appearing in Sport Aviation or a Builders Manual would be quite a thrill to any of us.

The Bulletin as we have said many times before, exists solely on items sent in by the readers. Consequently the letter belongs to all of you. Anyway, you don't think we could keep a letter like that to ourself do you?

We have always been staunch supporters of Paul, (not that it means a great deal), and will continue to do so. The pages of the Bulletin will always be open to him for whatever comment he wishes to make. Not many organizations have had the benefit of an individual like Paul and there is absolutely no doubt in our mind that EAA could not have been where it is today without him. We won't go into a lot of fancy adjectives telling about it, since his record speaks for him. Let's just hope that he can keep up the pace for a long time to come.

While speaking of Paul, we want to extend our sincere sympathy to him and his wife, Audrey on the recent passing of her mother, Mrs. Lillian Ruesch. Mrs. Ruesch had been living with Paul and his family for some time and her death came as a blow to all of them.

Mrs. Ruesch, while not directly connected with EAA did make her contribution in her own way, for which we, and all EAA members should be thankful. She more or less took full responsibility for keeping up the "home front" to permit Paul and Audrey to devote as much time as possible to EAA. It was through her love for them that they were freed of the thousand and one worries, problems and chores that go with keeping up the home and looking after things around the house. If anyone qualifies as an "unsung heroine" of EAA, surely Mrs. Ruesch does.

Obviously we are not very adept at expressing ourself in matters such as this, but maybe we have given you some idea of what we are trying to say. We are quite fortunate to have a wonderful mother-in-law, (a term we dislike) and to that extent have some small idea of the loss Paul and his family have suffered.

THIRD CLASS MAIL MEANS JUST WHAT IT SAYS

Our apologies to those who were later than usual in getting the last issue. As you may have noted, it went out "third class" mail and some copies were 3 to 4 weeks reaching the readers. It was an attempt to save a few dollars postage to plug on the typewriter but wasn't worth it. It makes us feel good though that the Bulletin is looked forward to enough to make you anxious to get it. For the remainder of this subscription year at any rate, we will go with first class mail as that is how we are budgeted. We hope to get on a regular schedule in the coming year and may try it again then. That however will have to be a "wait and see" proposition since we have never been able to get an issue out on schedule.

While on the subject, we want to offer again, any back issues that you may be missing for any reason. If you have lost a copy or didn't get all the back issues, let us know and we will send them. NOTE! ALL FIRST YEAR SUBSCRIPTIONS EXPIRE WITH THE JUNE 1968 ISSUE. All new subscribers during the year have been sent all back issues and we will have a clean cut-off with no hangover subscriptions. If you didn't get yours, let us know.

PHOTO CAPTIONS ON OPPOSITE PAGE

(The arrangement of the photos on the sheet, while not delicately balanced, does give us more mileage on having the expensive halftone negatives made.)

Upper Left & Right Center:

This is the 13 rib wing C.E. Multog was talking about. Rib no. 10 is 11" from bottom end of spar. The rib, second from the tip is double plywood on 3/8" square center strips. (look real close and you can see two pieces of plywood.)

Upper Right:

It took us a few minutes to figure out which side was "up" on this shot of Joe Byrnes ship taken a year ago. We finally decided that the light bulb must be in the ceiling. Probably the next time the fuselage will get in this attitude will be in a slow roll to the left. How about an up-to-date photo Joe.

Center Left:

This is a profile of what Joe Pope hopes his tail feathers will look like one of these days. Joe is eliminating most of the sub-rudder and the vertical fin is a mock-up of cardboard and paper. The rudder however is ready to go and only needs an airplane to control to be ready to fly. Just poking fun Joe, but after all, most people start at the front of something. (Joe, by the way, relaxes by wringing out a buddy's Clip-wing Cub on the weekends when he isn't drawing for the Bulletin.)

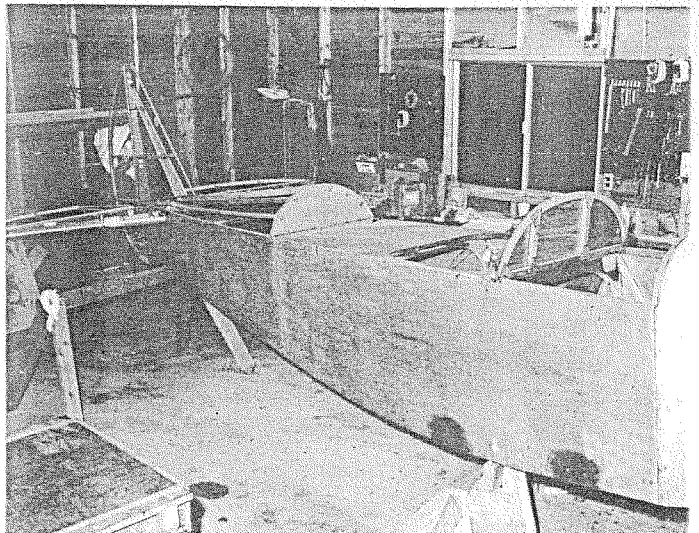
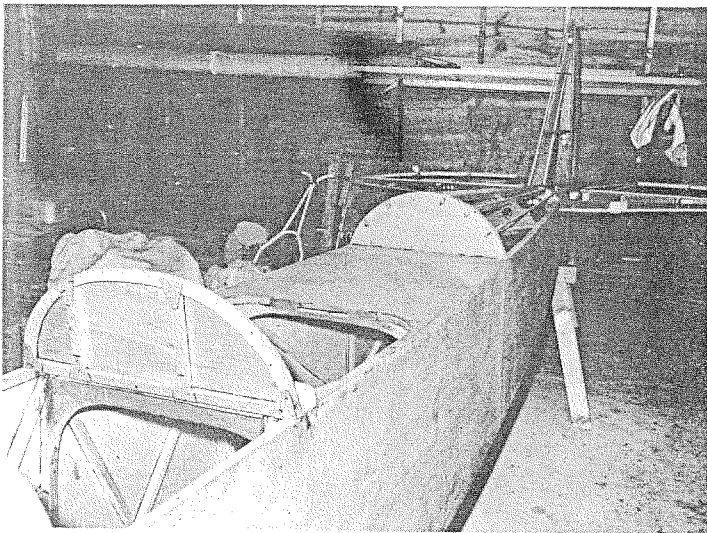
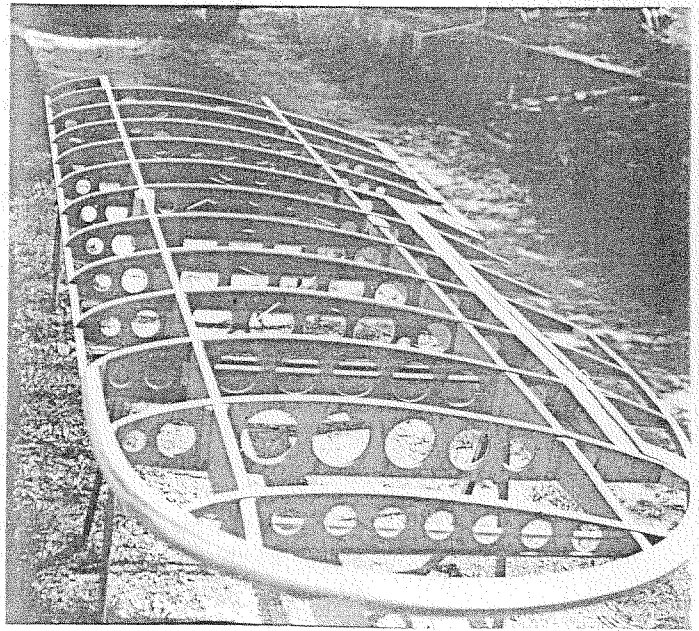
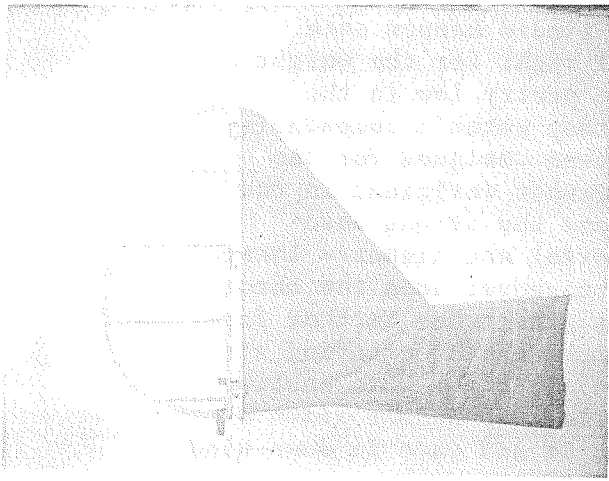
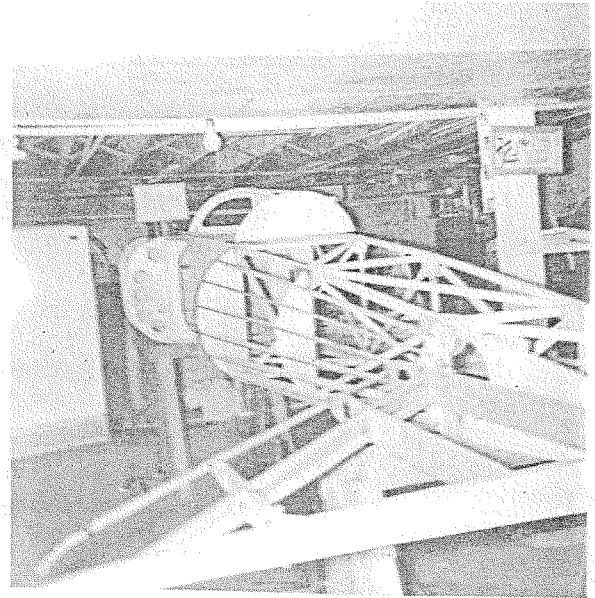
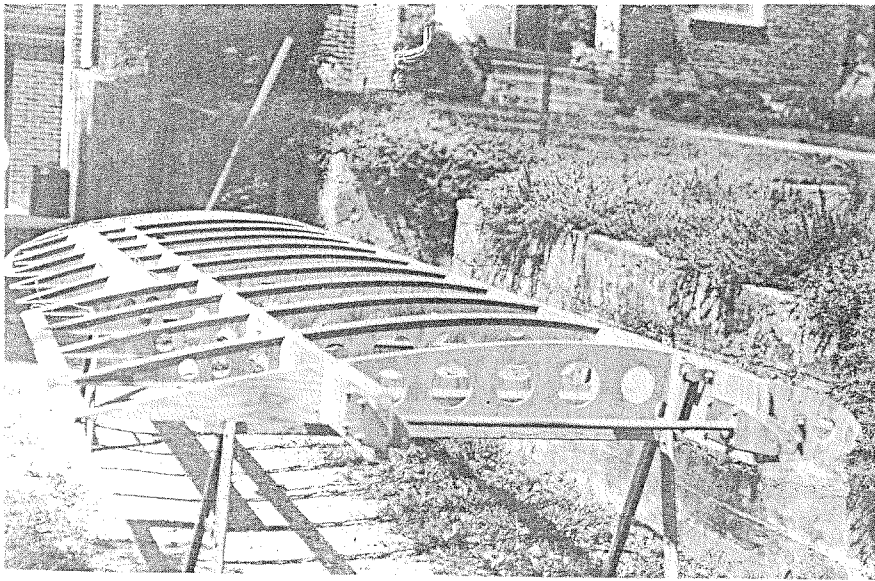
Lower Left & Right.

This is Riley Bumgardner's pride and joy. Forgive us Riley, but the first thing that flashed into our mind when we thought of a caption for this was "Moby Dick". We shouldn't even comment though, since our own ship is not even this far along.

This sheet of photo's turned out a little on the low side of the quality scale because we tried to get some very light shots on the same sheet with some very dark ones. When you do this, it demands a compromise between the two when you print. Ordinarily we try to group dark shots on one page and light ones on another, but at the time these were made up, we didn't have many to work with.

We are working on a "deal" to try to get the captions printed directly under the photos like the "slick page" boys do.

WE STILL NEED SNAPSHOTS Send us yours. We have a little back-log of photos to work with, but would like to have more. If you have sent us one that hasn't been printed, that's where it is, so sit tight and it will pop up before long. The photo-page has proven to be quite popular with most of the people we hear from. If you like them and want more, write and say so and we will try to oblige. Actually the cost per negative goes down, as you have more done at one time, so we may be able to swing a few more this coming year than previously.



PHOTOS ON OPPOSITE PAGE

Top: A beautiful two-inches-to-the-foot scale radio-controlled Fly Baby model built by BOB PARKS of Bellevue, Washington who did the Fly Baby drawings that appeared in the August-September, 1963 issue of Air Progress magazine.

Bob has been working up plans of this model for American Modeler for the past several years, but has been putting in most of his time restoring World War II airplanes.

There are plans afoot to try and get some flight shots of the model and the real 500F in formation. More on that later if anything develops.

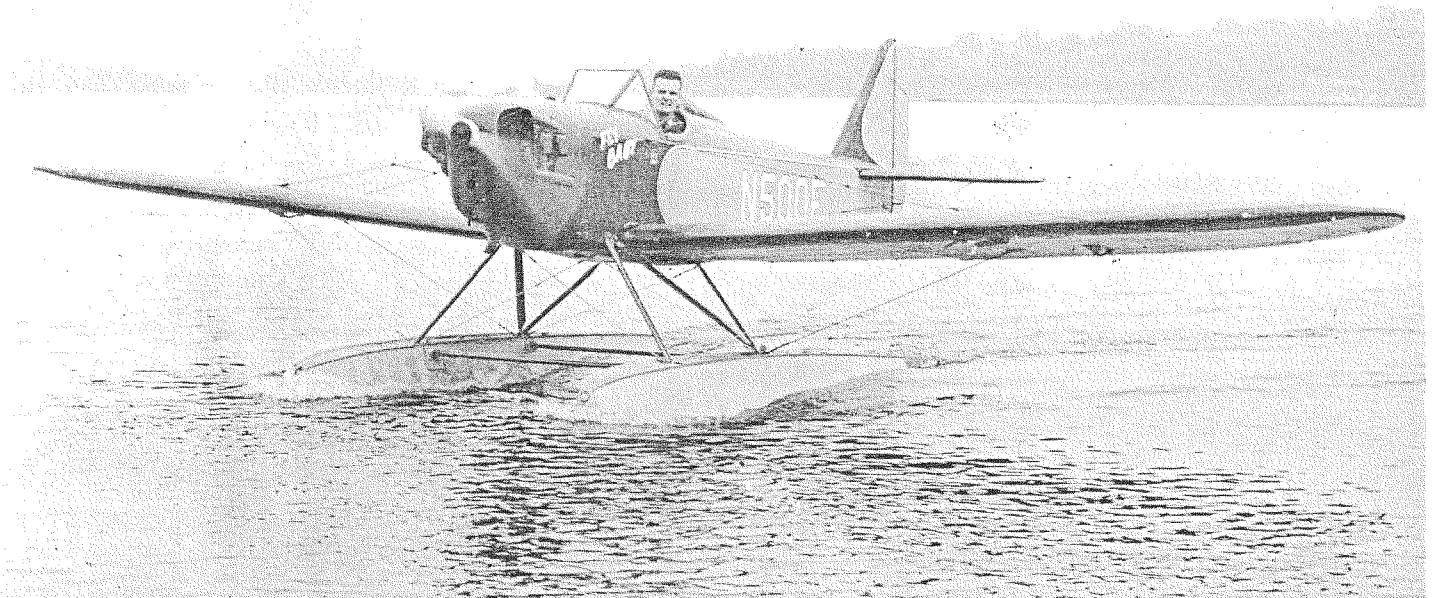
Bowers Photo

Bottom: One of the few shots of Fly Baby floating right side up as a seaplane, but to prove that it did happen once. the Edo Model 990 floats were all right for the weight of the ship, but even so, it rode pretty low in the water as you can see. However, they weren't compatible with the dynamics of it, having been designed for the 30 h.p. Aeronca C-2 and being somewhat deficient in the forward buoyancy needed to overcome the strong nose-down action of the much more powerful and higher - located 85 h.p. engine. After the first noseover when the throttle was opened, Pete moved the floats six inches farther forward, as far as he could get them, with the existing struts, and was able to take off and land all right with caution. The second dunking came when a pilot who hadn't flown a seaplane for 10 years had a go at it and came in down-wind.

Pete has now obtained a set of Edo 1070's, the next larger size with 80 pounds more buoyancy per float and hopes to fly off the water again this year.

Photo by Jim Slauson

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SOME COCKPIT PROBLEMS:

(The following article was written to go with the photos we ran last month of N2288C, Francis Londo's bird and N366RZ, belonging to Richard Zediker. As you will recall, we had lost the write-up at the time and promised to find it and pass it on. We suggest you get out last month's issue and look at the photos' as you read this.)

The photo's printed last month show two Fly Babies with some variations in the cockpit area that are NOT design improvements. N366RZ was built by RICHARD ZEDIKER of Ashland, Oregon, a beautiful white and light green ship with an interesting modification in the form of a filled-in landing gear. However, the headrest and the rear portion of the cockpit fairing have been left off, and a considerable undersize windshield is used. Maybe the buffeting the pilot takes from the slipstream with such an arrangement doesn't bother Dick, who may figure that your're supposed to be buffeted in an open cockpit, but it sure bothered Pete when he flew it because open cockpits can be comfortable and his certainly is.

It's not exactly an accident that it turned out that way, either. Considerable experience in flying other homebuilts went into the design of Fly Baby, and the good and bad points of several other cockpits were well in mind. For this reason, the windshield was made big and the rear cockpit coaming was kept high to protect the pilot's shoulders. Some smaller pilots sort of get lost in there without a cushion to sit on, but Pete's six-foot one-and-a-half sticks up pretty far. Even so, his shoulders are well protected. He stuck pretty far out of Dick's ship, and the cockpit criticism was the only one he had to make on it. (Note that Dick has his initials, RZ on the end of his registration number.

N2288C is FRANCIS LONDO's magnificent yellow and white bird in a better attitude than show elsewhere in a previous issue. It is almost stock in the cockpit area except for a slightly lower windshield and a lower rear fairing. This is just fine for Francis, as shown in the flight picture in Issue No. 2, but Pete had pretty much the same problem as in Dick's ship - no shoulder protection.

The flight shot on page 8 of Issue no.3 shows Pete making the first test flight in DAN DUNNINGS 125 h.p. long-wing bogey-gear Fly Baby. Pete's shoulders really are out in the open here because the seat is high and the cockpit sides are real low.

So, if you are planning a lot of cross-country work, or cold-weather flying, think twice before enlarging that cockpit cutout.

"ON MARKING OF AIRCRAFT STEEL"

JIM COX, Houston, Texas, of "8-day fuselage" fame, had some comments regarding an article in an earlier issue with the implication that it is alright to scribe 4130 steel in layout. (This guy Cox is a tremendous individual when it comes to diversification and someday when we have time and space, we will elaborate.) Suffice it to say at this point that he knows what he is talking about when it comes to working with aircraft steel. Among other things he is an aircraft mechanic with a licensed repair shop that is used for the most part for his own ship. Jim writes as follows:

"My main reason for writing is the implication that it is permissible to scribe 4130 aircraft steel in layout. Under no circumstances should 4130 or any other aircraft material be scribed unless it is an outline only with this area filed or ground off. (Con't.)

MARKING AIRCRAFT STEEL (con't.)

Certainly not on any bend area whether it be to the inside of a bend or not. Also any scratches on the steel should be removed before using.

To mark steel I use a silver pencil (Verithin Silver 753). This works very well for me. On aluminum I use a very soft black pencil. Prefer to chromate the piece before layout work. This helps to prevent scratches. Scratches are the start of cracks in metal.

Vise jaws should be padded with a soft steel or aluminum. This helps prevent multiple marks and scratches on material. Maple vise blocks along with white pine blocks are also used in my shop. The main thing I use as a guide in selecting pads is to use a material softer than the work.

As to glues I am very happy with Weldwood Plastic Resin. Since I don't plan to subject my airplanes to being boiled in water, I feel that it will give me the best results. Short of withstanding a boiling test for several hours this glue is adequate. Mix it to a thick cream consistency as per instructions with water about 75 degrees. Keep room and material temperature above 75 degrees, and below 90 degrees and I don't think you will have any trouble. I feel that resorcinall is too temperamental for the average woodworker. The portions are too exact for small quantity usage. Whereas Weldwood Plastic Resin lends it'self to small batch mixes very well. As to the newer epoxies, there again I feel that their usage should be limited to well controlled conditions. I feel that their strength is critical depending on the accurate blending. This is something for which the average builder is not qualified.

I have used the plastic resins for years on both aircraft and cabinet work with a minimum of trouble. Like I said, I am happy with it. I do wipe all excess glue away from a squeezed glue line both for appearance and to prevent possible crazing of old surplus glue. A wet rag of material such as an old undershirt works very well for this. Slick material just won't wipe. (end)

Jim also added some rather critical remarks concerning the "Buhl Pup" modification proposed by Eugene Wise on page 7 of the September 1967 issue. The upshot of his remarks on this was that the modification was a very unsafe move and that if pursued, would bring much harm to Mr. Wise's person.

Although Jim Cox is an expert aircraft metalworker, he is buying some of his fittings from Dick Weedon, which we feel is a strong vote of confidence in Mr. Weedon's quality and workmanship. The reports continue to come in praising the Weedon fittings. If you haven't checked them out, suggest you do so.

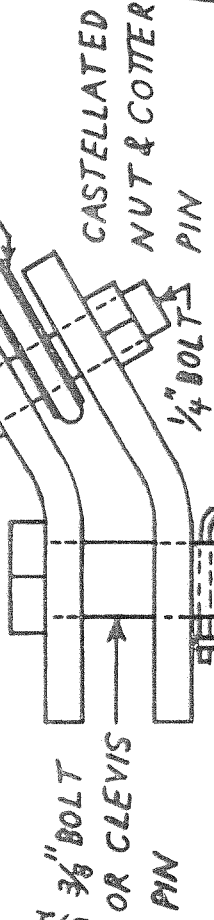
"A BELIEVER" WELL RECEIVED

How many liked the lines of "verse" we ran last issue by "A Believer" and didn't write and say so. Several did write, some with nothing else to say except they would like to see more of this sort of thing. If you did like it, let us know and we will try to persuade "Believer" to do some more for us. We feel that little "off beat" items like that make the Bulletin more enjoyable. It gets away from the flight reports, modifications and technical data a little and sort of balances them out. If you didn't like it, also let us know. After all this is your sheet and you are paying for it, so let us know what you want. For our own part, we enjoyed it tremendously and will publish more if you want us to and we can get it. We have to know however, so write.

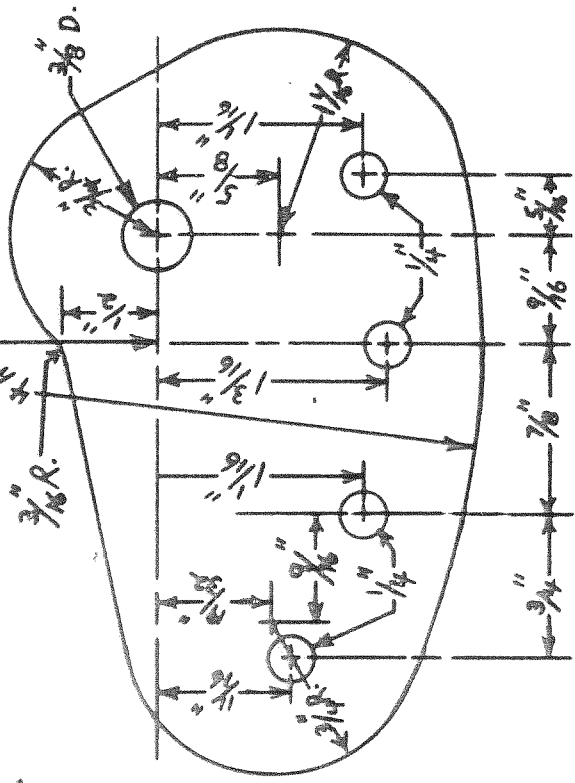
ASSEMBLY FITS OVER WING
WIRE ANCHOR FROM AXLE.
SEE PLANS PAGE 2-10.
REPLACES SHACKLE IN FLYING WIRE
FIGURE 2-5 D

FLYING WIRE
FITTINGS
BY
ERNIE HARBIN
FLINT, MICHIGAN

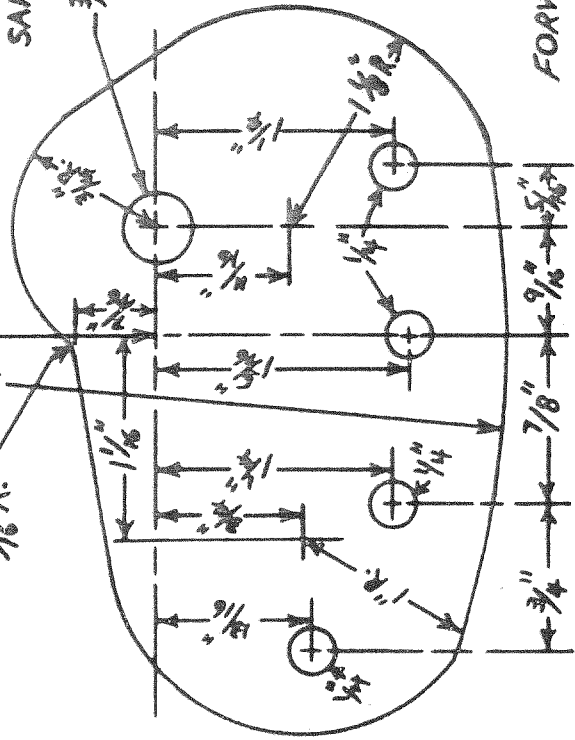
$\frac{3}{16}$ " 4130
STEEL, MINIMUM.
MAY BE HEAT
TREATED TO
INCREASE STRENGTH.



$\frac{3}{16}$ " R.
 $\frac{3}{8}$ " R.
 $\frac{3}{8}$ " D. HOLE
SAFETY PIN



TOP PLATE, MAKE 2 OF
 $\frac{3}{16}$ " 4130 STEEL, BEND
1 LEFT & 1 RIGHT.



BOTTOM PLATE, MAKE 2
OF $\frac{3}{16}$ " 4130 STEEL, BEND
1 LEFT & 1 RIGHT.

FORWARD
INBOARD

Joe Rapp
1-9-68



JUST RAMBLING

This is the page we always have mixed emotions about. We are always glad to wrap up another issue and get it out to you, because that's the whole idea. All the work we put into it isn't worth a darn until we get it in your hands. Also we are always anxious to get started on a fresh issue. On the other hand, we always wind up with several items that we meant to include "for sure" in this issue and run out of space. (We have to quit somewhere).

Like for instance, some stuff from BOB GAEDE that we promised would be included a long time back. Also a sheet we found in the typewriter when we came home from work one night. (Guess who authored it.) There are quite a few more. Still, the back-log can't get too large. The bigger, the better.

We would like to see the mail come in so, that we would have to go to a 3 ounce limit for mailing purposes instead of the present two ounce. If we can round up a few more readers in the coming year, (just three issues away), we may just be able to go to three ounces. We are willing, if we can get the guys to sign up. If you know of any that haven't and need prodding, see that they get it. There are several dozen builders and pilots around the country that don't "belong", and we would like to have them.

At the moment, our subscription list stands at 197 total. It can probably be raised if we will get busy and contact some of the people who we read and hear about, if we can just find the time.

If you have written us and don't have any answer yet, please don't be angry. We will get around to it sooner or later, but the Bulletin takes precedence and we fill in between trying to catch up on correspondence. We plan within the next 60 days to get current with our correspondence and then keep it that way. It seems that once you get behind, you stay that way.

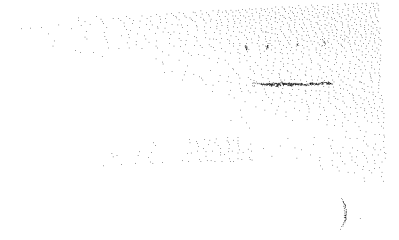
Please don't mis-construe this as our not wanting you to write. Nothing could be more wrong. We do want to hear from you, even if it is just a note telling us that you finished a wing rib or the wife chewed you out for nicking the dining table with your saw. We enjoy it all. The letters are the most vital part of this whole lash-up and we wouldn't last 30 days without them.

A CLOSING "BRAINSTORM"

By this time you should be pretty well convinced that we are practically pleading with you to be at Rockford if at all possible. The motivation, we must admit is a selfish one from our standpoint. We want to meet as many of you as possible. It is much easier to write about someone when you have met them and you also feel a little more freedom in what you can say and when. We are already getting a surge of excitement even though it is over two months away.

The "brainstorm" we had was to bring to Rockford a photo album of pictures sent in by different people, and pass it around for others to see. We will try to work it up complete with captions, in a 3-ring binder in plastic holders, if time permits. This isn't a promise, but will come up with something.

Well, see that the bottom of the page is coming up, so guess that is about it for this time. If you like what you have read, say so and if you don't, be sure to say so. At any rate, let us hear from you. "See you" next time.



THE **FLY BABY** BULLETIN

Issue No. 10

April, 1968

This issue of the Bulletin was a long time coming, but finally, here it is.

Publication was interrupted for a time for several reasons and we won't waste a lot of space here going into all the ramifications of why. We do however feel that some explanation is in order and sincerely apologize for the delay.

Our primary problem was temporary loss of our printing facilities, and the secondary was time to spend on the actual preparation of the Bulletin. However, with a little luck, we will have our printing back soon and the time situation should improve considerably. The fall and winter months are our "slow" seasons and we will be able to devote a lot more time to the paper. Needless to say, our own "Fly Baby" project has suffered from the same ailment of time.

Starting with this issue, we plan a "crash" program of getting up to date and staying that way. (there must be a better word than "crash"), oh well, what we mean is, get back on schedule and stay there. Don't hold your breath though, as we have had this same ambitious plan before and always got shot down one way or the other.

So much for explanations, now to get down to the business of passing on the "stuff" of which the Bulletin is made.

BOWERS WINS RASPET AWARD

PETE BOWERS has been awarded the DR. AUGUST RASPET AWARD for 1968. This is the highest honor that EAA has to offer and the task of choosing the recipient is not taken lightly. The selection is made by the EAA Board of Directors, and there are literally dozens of aviation "greats" that must be considered. We can all take great pride in the fact that "our man" made it. On behalf of our readers and contributors, we want to offer Pete our most sincere congratulations. He has earned it.

On behalf of Pete Bowers, we want to thank those who took time to write the Board of Directors recommending Pete for the award. We had several letters to this effect and like to think that maybe they had just a shade of influence with the judges.

Unfortunately, we were not able to be at the Awards Presentation the final night of the Fly-In at Rockford, to see Pete get the award. It was necessary that we depart Rockford a few hours earlier than planned and consequently did not get a photo of Pete accepting the plaque. If someone did get a shot of the presentation, we would certainly appreciate your sharing it with us.

That is the extent of the Rockford news for this time and it may look a little awkward in the April issue to see August news, but we couldn't pass up the opportunity to let those know that are not in EAA and didn't get to the Fly-In this year.

SOME BASICS ON METAL "GRAIN"

After reading the comments in the March issue by AL DOUGLAS, we had a letter from ED MORE, of Simsbury, Conn., which we found to be very enlightening and educational.

Ed is a Project Engineer on aircraft propellers and related products and consequently speaks with some authority on the subject of metal "grain". His letter follows.

"The March issue of the Bulletin arrived today and I was struck by the comments reported by Al Douglas. I felt I should send in some comment on metal "grain" for two reasons. One is that it is a very fundamental concept that is involved and the second is that it is a very commonly partly-understood and misunderstood concept of materials application.

To start the comments, I would like to state that all metals that are in a solid state, that is not gas or liquid, have a crystalline structure. A crystalline structure is one where the molecules are arranged in a fixed geometric pattern, that is, each in a row with a constant dimensional relationship between its neighbors. When a metal solidifies on cooling the molecules assume this pattern naturally. The gross or general direction of the crystalline lines are random in nature and start at many locations in the molten metal. As the metal continues to cool, the growth of the crystals meet at boundaries on all sides. Finally the entire amount has solidified with these randomly oriented crystal structures completely intertwined on themselves. If one polishes the surface of the metal and then etches it with an acid, the boundaries are clearly discernable. The size of the crystal structures depends on the type of metal, alloy, and the rate of cooling. The pattern of boundaries is called the metal's grain structure. In cast material it is randomly orientated and equal in size in all directions.

Now, if we take this metal with a random grain structure and beat on it with a hammer or pass it between rolls under load with sufficient force such that the metal is deformed the grain structure is compressed and the roundish grains are flattened in appearance. Metal is virtually incompressible so when we flatten in one direction, the metal "squeezes out" in the other direction. This gives rise to a "strung out" appearance of an etched specimen of flattened metal which is called grain flow. The whole process is called working the metal, whether hot or cold. Forging, rolling, peening, hammering, or bending are all specific forms of working the metal. Sheet stock is formed by rolling and the material is identified usually by passing it under a printing roll in the same direction that it is worked or rolled.

So much for the physics of the situation. The next question is, "So what does the working do for you"? The answer is rather complex because it does many things, both good and bad. When the material is worked, it gets harder and stiffer. It is more resistant to fatigue, resistant and stronger. An analogy can be drawn with the benefits of twisting rope with the long fibers all orientated in one direction as opposed to loose fibers like absorbent cotton. These are all good changes, however you can only work the metal in one direction at a time. That means that it is stronger in one direction than another. In fact if we bend it too severely with the grain, it will crack. Whereas across the grain at the same bend radius, it will survive. Try that on a piece of aluminum alloy sheet to get a graphic demonstration. This makes it very necessary to observe the grain flow in making sheet aluminum and sheet steel parts. Bends lined up with the grain flow are to be avoided in all structural parts. Ninety degrees to the grain is best for strength reasons but compromises up to 45 degrees are generally acceptable and greater angles if the bend radius is increased some. (Con't.)

METAL "GRAIN" (Con't.)

Since we do not usually go around etching and inspecting with a microscope, it is a great convenience to have the manufacturer tell us in which direction the metal is rolled or worked. This, incidently, explains why forged parts are stronger than cast parts and why forged parts are generally not repairable by welding, unless additional strengthening is also accomplished. A weld is cast material and needs to be thicker to be as strong as the rolled sheet parent metal. That is why we build up the weld bead. Otherwise the metal is only as strong as cast material.

This could go on at some length into heat treatment of metals and its effect on grain structure. Corrosion properties are also a consideration. Maybe some day this will come up in the Bulletin and we can talk some more. (end)

Our thanks to Ed for this, which may be "old hat" to a lot of you, but is brand new information to some of the dyed-in-the-wool "wood butchers". When he has time, we would appreciate Ed elaborating on some of the fine points in aircraft grade welding. A lot of us will probably never do any welding to speak of on our bird, but you can bet your "sweet bippy" that we will be watching the guy who does, real close. It would be quite helpful to have some idea of what is going on, and what to watch for to be sure good practice is being observed. Keep that in mind Ed and let us hear from you.

For those looking forward to Rockford, you may get to see Ed's ship, N59229. He claims that being a glider pilot has spoiled him on trim and consequently, he has installed a rudder trim on his ship. (He also has a Musketeer reserved, just in case his own ship can't make it by then.) Will be looking forward to meeting Ed and a lot of other Fly Baby builders.

LIKES LONDO'S WHEEL PANTS

Had a letter from BILL HARGREAVES, of Chicago asking for FRANCIS LONDO'S address. Bill likes those wheel pants. (Don't we all.) Don't know if Francis made them or not, but since he will be at Rockford, as will be Bill, they can get together and swap info. Bill hopes to have his ship finished by this time next year and sent along some photos which we will work into a future issue. One of the shots, by the way, is of Bill perched in the fuselage framework on a "flight of fancy", which Pete warns us about. Wonder if anyone has ever built his airplane without indulging in several hours of daydreaming flights along the way?

Speaking of Londo's pants, wheel that is, we will visit with him at Rockford and get more info on them. Actually, Francis' airplane has caused quite a lot of comment in our correspondence and we are looking forward to seeing it. The photos we ran on it, are among the most popular to date. Everyone writing, comments on what a beautiful ship it is. This is the same fellow who built his ship first, and then learned to fly. Must be quite a guy.

STANLEY SURFORM GAINS SUPPORT

GENE OLSON, of Eau Claire, Wisc. signed up for another year, and added his own comments on the Surform. Although he hasn't been able to get started on his ship yet, he has used the tool on some "homebuilt" furniture and really liked it. Several others have had similar comments and if you haven't tried one, we suggest you do. We did ourselves and were very pleased. It takes about half an hour on scraps to get the hang of it, but from then on, you are a "pro". If anyone has any other hand tools of this nature let us hear from you.

"MISTAKES I MADE"

The above is the suggestion of LOWELL E. MORROW, of Yorktown, Ind. for a page in the Bulletin devoted to errors made by builders that could be helpful to others.

We like the idea ourselves, and will be glad to incorporate it into the Bulletin if we get the information to print. This feature could very well save a lot of builders time and effort wasted, to say nothing of the money saved.

Lowell doesn't mind admitting that he has made a few goofs along the way and to get the ball rolling, sends them along with the hope that it will save someone else some trouble. His comments follow.

To start with, try your wheel bearings on the axle before going too far. Mine were .005 oversize. Took an awful lot of emery cloth and sweat. Would have been easy at a tool shop or between improvised centers.

Goof No. 2: Thought I would clean up the axle a bit and use the Cub axle nut, threaded axle, etc. Looks good, except --- don't have room in the hub to insert the 3/16" bolt through axle and wing wire anchor. Solution? Use a nipple from an MG wire wheel spoke, (they are 10/32 thread) and a short bolt. Better still, go by the print.

Suggestion: Use a 1/4" plate nut on the top bolt going through the Dural angle. (Fig. 1-16, page 1-22). If this bolt is placed close to the top, the cowling will be held down by this bolt, thus making it tricky to put on a loose nut.

On page 1-26, fig. 1-19 shows 3/8" holes in the wing wire fitting. On page 1-25, par. 10 it says to drill 5/16" holes. I used 3/8" bolts but had quite a time installing them. Close quarters in that corner! Seems to me all the pressure would be on the wood frame anyway, so maybe the 5/16" is correct. How about that Pete?

For you fellows, that are going the "cheap" way, like myself, I found that a truck power take-off control makes a swell throttle. A locking device can be made by silver soldering a 1 1/2" washer to a 1/4" brass flare nut. File one tapered end off a 1/4" tubing ferrule, saw four slots in the other end about 1/8" deep. Remove knob from control shaft, slip on ferrule, filed end forward, then screw on nut with attached washer. Ferrule will butt against threaded body and nut will squeeze ferrule on tightening. Slots will let it spring back for loosening. File notches in washer for finger grip. Flare nut has the same thread as control. Compression fitting nut does not.

Have run out of do's and don'ts so had better close. Still waiting on the dope on the moulded seats. Oh yes,---the little woman has a bit of advice. Don't let Orville build wing ribs in the kitchen! When he gets down to the last three or four nails at the trailing edge, the glue just has to go somewhere, mostly on the @\$%#*&c%** wall! Thats all folks-- (end)

Thanks Lowell, and keep working on the plastic moulded seats.

If you like the idea of a regular "Mistakes I Made" feature, let us know and we will do our best to work it in.

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