Pulsar News

News, Updates, and Developments for Pulsar Builders and Owners

Issue No. 3 | Published by the Pulsar Builders' Association | March, 1990

OPENING:

Greetings to everyone once again. This month's Pulsar News covers a lot of topics. Besides the "Builder Input" and "From the Factory", we've included Part 2 of Harry Jone's Pulsar finishing experience, the promised overview of plastic airplane antennas, and an updated Pulsar builders' list.

As part of the May '90 Pulsar News, I'd like to include a "Builder Status Report" to show how far everyone is in their projects. If you'd like to participate, please send me a postcard indicating how far you are in each of the 3 Pulsar kits (fuselage, wing, and engine). I think it will be interesting to see how far each of us is in the construction.

BUILDER INPUT:

1) John Bon Hartline: Don't throw away the fuselage crate when your Pulsar arrives. The floor of the crate can be used as a sturdy workbench top. Legs can be constructed from 2x4s or 4x4s.

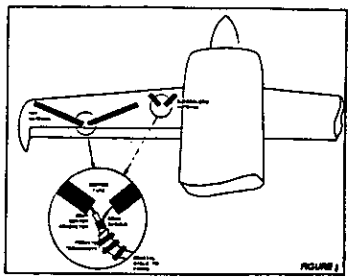
2) Bill Baltus: Bill has utilized a "Blazer Deluxe" auto halogen headlight as a landing light in his Pulsar. Bill removed the front lens with a hacksaw and made a "U" shaped attach bracket which attaches to the main spar and the top and bottom of the light. To act as a heat barrier, Bill used 5/8" fiberglass ceiling tile cut to the shape of forward ribs #12 & #13 and bonded them in place. The light does generate significant heat so the barriers are a must. Bill has sucessfully tested the configuration for 30 minutes.

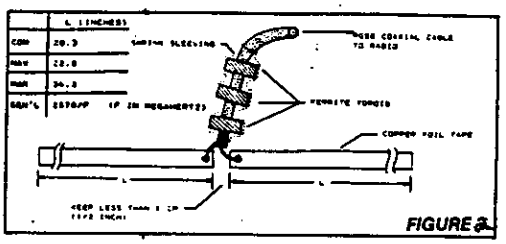
Several builders have written about the Radio Shack security strobe light which can be utilized as a Pulsar strobe. The light assembly can be removed for mounting and utilizes 12VDC. The light costs about $22.00. No information is given on expected strobe lifetime, but I hope to do some tests on a sample (time willing) to determine whether the strobe has a sufficient flash life.

PULSAR ANTENNAS:

Numerous discussions among Pulsar builders have centered on antenna design and installation. The composite fuselage and wings present unique design problems as compared to metal general aviation aircraft. To help clarify the situation, I previously volunteered to do some digging and present the results.

Clearly, Jim Weir from Radio Systems Technology has written several articles on "plastic airplane" antennas and the "ferrite-foil" dipole antenna design he describes is simple and inexpensive. The ferrite-foil refers to the copper foil tape which makes up the elements of the antenna (like the rabbit ears on a TV antenna) and the ferrite coils which prohibit unwanted RF power from traveling up the coaxial cable shielding into your com radio where it can do serious damage. These coils go around the end of the standard RG-58U coax antenna cable (cable available at Radio Shack) which is used to connect all the antennas described to your radios. The only difference between the com, nav, marker beacon, and glideslope antennas is the length of the foil antenna elements. In addition, the com antenna needs to be mounted vertically, and the vertical tail fin is the obvious choice for placement. All of these antennas (see Figures 1 & 2) are not affected by foam or fiberglass so they can be epoxied in place without affect.





Figures 1 & 2 (reprinted from the September, 1982 "Sport Aviation") show the basic ferrite-foil design and suggested placement for the nav and g/s antennas. The ferrite coils are attached to the coax with shrink tubing. The nav, marker beacon, and g/s antennas can be mounted horizontally in the wing with the nav antenna mounted as far outboard as possible. Note that the copper foil tape is thin and will fail with tension. When mounting the antennas, place them so that any flex will cause compression instead of tension. Also use rubber sealent generously around the solder joints and between the coax and antenna elements.

The point of this very simple and extremely brief overview is to show that inexpensive antennas can be easily made with good performance characteristics. Prior to learning about ferrite-foil antennas, I purchased a com antenna from Antenna Dynamics. It cost $99.95 and is based on a very similar dipole design. Seeing both antennas, I would recommend you make your own.

RST sells the copper foil tape (10'-$10, 50'-$35) and ferrite coils. The 10' length is long enough to make a com and nav antenna, but no more than that. RST sells the ferrite coils for $5 for 20 (minimum amount).

The $40.00 for foil and coils is still more than it needs to be as I have found a cheaper source for both items. For anyone planning to buy 50' of copper foil tape, I've found a significant savings by buying larger rolls and then cutting them to 50' lengths. As such, PBA will offer to all Pulsar builders the same 50' foil tape for $20 (about 50% less!) I've also found ferrite coils for about $3.00/20 (a little savings) just so you'll have both parts for your antennas. For $23.00 you'll have enough tape and coils to build every antenna conceivable and still allow for mistakes/repairs which should help everyone. I'll also include shrink tape (because it's not easy to find) and a detailed construction and installation sheet to guide you which should give you everything you need to make the antennas (except the coax). If you're interested in the copper tape/coil/shrink tape antenna kits, just drop a note telling us what you want (and include a check) and Kim will get it right out to you.

"The Pulsar Finish--Part 2" by Harry Jones

I've just returned from the paint shop where my Pulsar was Imroned so I'll try to pass on what I learned.

Two aspects stand out: Dust and surface imperfections. The spray booth that you use must have filtered air and a wet floor to hold the dust to a minimum. The spray booth and parts to be painted should be at least 70 degrees also. As for surface imperfections, don't sand primer with your fingers--use a foam rubber-covered block. I'd recommend not using anything coarser than 220 grit on primer coats after the UV coat.

In preparing your Pulsar for painting, be sure no red primer or filler shows including pink-looking Bondo. Even tiny spots will bleed through the white finish coats. Scuff all surfaces with Scotch-brite pads #7447. (Note also, if a Pulsar part needs to be repainted later, these #7447 pads are enough to remove gloss before repainting). Wash the Pulsar with Prep-Sol and follow with alcohol if static charge is noticeable. Wipe lightly with beeswax tack cloth.

Imron dries out of dust in about 15 minutes but a too-heavy coat can sag after that. It also

will continue to flatten i.e. the slight orange peel will reduce for several days. Minor overspray, courseness from a thin coat which didn't quite flow evenly, or very minor orange peel can be rubbed out with polishing compound and a special glazing compound (available at your auto body shop supplier). Even a small run can be sanded and compounded out after a week or so. Dust specs will not be removed by compound. Use 600 or even 1000 paper, then polish.

The pro's I watched used accelerator. The more used, the more Imron you can load on without sags, but the more you must apply to get the Imron to flow. I think the goal is to spray to the point of a high gloss with just a hint of orange peel, counting on the stretch of the Imron to flatten it. If one is experienced, one can use less Imron by using less accelerator. Those spray men I talked to didn't use any reducer. We used a total of 1.7 gallons of unmixed Imron. I'm sure a real expert could do it with 1.5. I used DuPont 817-U Chevy truck white which Mark says he used. I think it looks slightly grey especially indoors but I like it.

Finally, the spray booth must have plenty of fluorescent lights or you won't be able to see when the Imron flows or see dull areas. As for striping, there is a whole group of rather new products which make this work far quicker and more precise. If you aren't familiar with them, talk to a painter in a "speed shop", a good auto-finisher's supply company, or a large commercial sign company which has a Gerber Scientific "Sign-Maker". For long stripes, the Gerber Sign-Maker can make you a full-sized pattern and zap it with an electric Pounce-perforator in less than an hour. Then you can "Pounce" lines on your bird and tape to them.

FROM THE FACTORY:

Congratulations are in order for Enrique Vasquez of La Piedad, Mexico. He sent us some pictures last month of his beautiful Pulsar in the air! He spent about six months in construction but that's about all we know because of the language barrier. We hadn't heard from him since we shipped the kit.

We finally have a propeller matched to the Rotax 582 and the results are very exciting. I've flown several calibrated performance tests and recorded a solid 130 TAS cruise! That's what I knew the Pulsar would do all along and it's very rewarding to finally get the engine/prop combination to do it. With the increase in diameter and pitch this new propeller does reduce the max static rpm to about 6000, but with more disk area the take-off performance is about the same as before. On a standard sea level day the take-off roll is about 800 feet. The increased propeller loading does increase the fuel consumption somewhat, but I haven't made any careful measurements yet. For those of you who haven't received a prop yet, we'll have a limited supply in about 3 weeks, but we'll try to only send props to those builders who are ready to install them until we get caught up.

On the subject of props, we've sent the mass properties on the Lectro-Prop to Rotax for evaluation. If they approve this controllable pitch prop for the 582, we'll do the testing this summer and let you know how it works. However, I must tell you, the two-cycle engines are very sensitive to prop loading and a controllable pitch prop has the potential to cause some real problems.

Several people are now installing their 582 engines, so I need to discuss the oil injection system that comes on the engine. We've done a failure analysis on the oil pump, drive gear, reservoir, plumbing and throttle connection and we don't believe the presumed convenience of oil injection is worth the extra complexity and risk of failure. In addition to the mechanical risks, the likelihood of operator error increases. A 1/2 gallon oil tank is adequate for about 3 tanks of fuel, which will run just long enough for the operator to forget about it. That brings up the need for an oil quantity guage which is just another complexity. I can tell you from experience that adding oil to the fuel tank on a cross-country flight is so quick and easy (and habitual) that an oil injection system is just an unnecessary hassel.

Rotax does not disagree with our evaluation of oil injection. However, they do recommend removal of the oil pump if it's not used because it is normally lubricated by the oil circulating through it. A page of removal instructions is included in your engine manual.

On the subject of priming and painting, we've decided to start recommending a very thin (1.4 oz.) layer of glass over the plywood wing skin. We think the improved durability is well worth the couple of pounds of weight. We do have plenty of 1.4 oz. glass in stock. The cost is $60 for enough to do both wings. Just use Epolite 2315 to install the glass.

We have good news from the FAA! The Pulsar has been evaluated and approved under the 51% rule. However, the approval list is only revised and published twice a year so it could be a few months before some of the FAA offices are aware of the approval. If your local office wants verification of approval ask them to call Phil Palmer at the San Antonio manufacturing and inspection district office.

Now I have a few builder suggestions/corrections. Harry Jones has a different approach to the fuel tank installation. Instead of leaving the instrument panel loose to install the tank, he just cut a couple of small triangles out the instrument panel bulkhead so the tank could pass under the panel. Also, a couple of builders have reported that the starter cutout in the firewall is mislocated. Therefore, don't cut this hole until the engine and starter are in place.

The manuals fail to mention the 4" extension that must be added to the pitot tube in front of the wing leading edge. Just use a short piece of 1/4" fuel line (no clamps needed) to install the extension. This will allow the extension to flex when you bump into it.

Some builders have reported poor pivot freedom on their epoxy balance. This could be very serious because the epoxy mixing ratio should be within about 5%. If your balance beam sticks and doesn't move freely, you should add roller bearings on the pivot shaft or go to a knife-edge pivot.

I have a long and rather boring story about why the flaps in the up position don't match the wing fillet. It has to do with the aft-loaded airfoil we got sucked in to and how it doesn't perform as advertised. Anyway, there's not much we can do about the mismatch short of a mega-buck mold change on the fuselage mold. If it really bothers you, you can rig the flaps and ailerons down a few degrees and reshape the wing tip to match. You'll only lose about 2 mph in cruise. Or you can leave the flaps and ailerons up and reshape the aft wing fillet. However, I don't think one person in a thousand has noticed the mismatch on our airplane, and aerodynamically you're talking about milli-mph. Well, that's about all the news from this side. I hope to see some of you at Lakeland. Our forum is scheduled for 10:00 AM, April 10th.

WRAP-UP:

As always, thanks to everyone for the input. In the May '90 issue, Laverne Lawrence will report on her Pulsar activity and will share her painting experience! Also, I'll be returning the color photos to those of you who have sent them to me. I've tried to get a decent reproduction to be used in the newsletter, but color prints are very tough for the printer to get decent copies of. If anyone would like to submit photos (which I do encourage), please send black & whites if at all possible and I'll do the rest.

Please send everything to:

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Kim McCann, ICOEE (In Charge Of Everything Else!)

Pulsar News

News, Updates, and Developments for Pulsar Builders and Owners

Issue No. 4 | Published by the Pulsar Builders' Association | May, 1990

OPENING:

Hello to everyone and welcome to all of our new readers. I've decided to spare all of you from any belated April Fool's Day jokes and get right to business as there is a lot to cover. I was glad to see many of you at Sun N' Fun. It's always nice to be able to share building experiences, suggestions, etc. with all of you. I've not received a lot of builder input for this issue, but I have talked to many of you individually. The canopy has occasionally come up as a tedious part of the Pulsar construction. Many of you have had very little difficulty and others have encountered some problems. I found the canopy construction fairly straight forward, taking about 10 hours (maybe a little more) from start to finish. To allow other builders to benefit from your experiences, if any of you could let me know where the problems have occurred, and how you solved them, I'd like to include that input in future issues. Also, we're still compiling builder status reports. Drop me a postcard and tell us how far you are. I'll put the compiled results in the next issue.

As you have obviously noticed, we've changed the printing of "Pulsar News" to minimize the loss of any pages. I hope that the new format is more useful, and as always, we welcome any comments and suggestions.

BUILDER INPUT/NOTICES:

Pat Keesler (414-731-9626) has put together some plexiglass wing tip inserts for use with nav/strobe lights. Please give Pat a call if you'd be interested in either type.

Greg Smith (216-835-8748) has informed me that he'll be camping at Oshkosh '90 and would like to organize a "Pulsar Camp" for all the Pulsar builders who plan to camp. Greg has asked that you call him to let him know who's planning to camp and the dates you'll be there.

Speaking of times, we've arranged to have a "Pulsar Builders' Forum" which will be separate from Mark's general Pulsar Forum during Oshkosh '90. The Builders' Forum is specifically set to respond to builder questions, problems, fixes, etc. Mark Brown, et al. will be there so bring your questions! The Builders' Forum is scheduled for Sunday evening, July 29, 8:00pm, Tent 8. Mark's general forum is set for Monday morning, July 30, at 10:15am (?) so it should be convenient for everyone who wants to attend both. We look forward to seeing you!

Pulsar hats - In response to requests from several of you, Kim has come up with some very nice "Pulsar" hats for Oshkosh '90 for all of the builders (and anyone else of course). They have the Pulsar design as painted on Mark Brown's prototype. We'll have them within a few weeks and the cost will be $7.00 which was pretty good given what some places wanted to charge for the artwork, screening, ink, etc. We can also mail them to anyone who wants them before Oshkosh, but please include $2.50 to cover the costs for the shipping box and postage. (If you want more than one hat mailed, just send $2.50 total.

Strobes - The last issue of Pulsar News talked about the Radio Shack security strobe and how several builders were modifying this strobe for use in the Pulsar. It must be stated, however, that these strobes will not meet FAA requirements for brightness and if you use them you need to check with an FAA inspector prior to formal inspection to insure that use of these strobes will not cause a certification problem. I do not know how the FAA views matters such as these, but do take the time to check prior to having your Pulsar certified to avoid problems or delays.

PULSAR UPDATE - Lavern Lawrence

Just a few lines to update the Pulsar builders on my Pulsar. Jim and I have flown it 90 enjoyable hours...well, except for the first 2 hous that I flew it!!! I thought is was the Pulsar, but after 2 hours of flight, I could see it was ME. I had been flying a Cessna 210 so, I had to get use to the short control stick and the quick response to its movement. Now it is so simple and easy to fly I enjoy every minute in it. It takes off short, climbs good, cruises real smooth and it isn't very noisy at all inside. Another important thing to me is, if you use the little trim tab to help you in landing, the Pulsar just settles down and lands like a bird. You get a smooth landing nearly every time. Another thing I have heard some concerns about are the brakes. The Pulsar lands so slow that I, for the most part, just roll to a stop, often short at that, and I use the brakes on turning and they are plenty good for me.

Jim didn't fly the Pulsar much until we returned from Oshkosh when he took a job that took him 2 hours and $11.00 worth of fuel in his pickup compared to 30 minutes and $3.00 worth of gas in the Pulsar. Besides the economy of it, he just liked to fly it because you don't work to fly it. You just sit back, look around and enjoy it. As you can see, I really like my Pulsar. From here to Oshkosh (approx. 900 miles) I burned 27 gallons of auto fuel. Guess what--you don't always get the red carpet treatment when you stop for 5 or 6 gallons of auto fuel, but who cares because with the money you save on gas you can buy your own red carpet. No kidding! And you can afford to fly and enjoy this little plane knowing you are not spending a lot of money you need for other things.

There are certain disappointments involved in everything we do though. On the Pulsar, my disappointment is the fact that there is no place in Nevada that sells auto fuel and I sure had visions of flying it to Las Vegas. But I was concerned about being overweight coming back with all that money, so you see, everything worked out for the best after all.

Now that several of you are getting near to painting your Pulsar, I am sure you have some of the fears we had. Forget your fears because anyone who has gotten their canopy together and looking good will find that the painting will be a breeze. I will tell you how we did ours and you may or may not want to use this method, but it worked out real well for us. First, it is a real rubbery and plyable type finish, and if you have a fender bender, which is always possible, then unlike some finishes, the area can be spot painted and blended right in by buffing it out.

First, we scuff sanded all of the composite parts with 180 grit dry sandpaper to remove the shine, then we mixed K-200 and K-248 per instructions on the can and we squeeged the entire plane. Let this dry approximately 24 hours then take 180 grit dry sandpaper and hand sand it back down to the fiberglass. Now, take an air hose and blow the airplane off thoroughly. You will then be able to see all of the remaining pinholes you missed the first time. Just take your K-200 mix and spot fill with a squeegee, let dry, and sand. Continue this process until all of the pinholes are filled. Depending on the weather conditions, the pinholes will fill better than other times which has to do with static electricity. Also, while spot filling the pinholes, go ahead and fill the low places and the seam line where the Pulsar is joined together. When this is complete, you can use Deltron black mixing base and mix 1 quart black to 1 gallon of the K-200 mix and spray 1 good wet coat. Just let this flash and go right back over it with the K-200 and K-248 mix, applying a fairly heavy coat. Let this dry 3 days or more and block sand it back to where you will see the black in some places, but do not sand into the black (Use 320 grit wet sandpaper for this). Now apply another coat of K-200 mix and allow it to dry 5 to 7 days, then block sand it with 400 grit wet sandpaper. If it is needed, you can just spot fill and block from here, but by now it is most probably ready to paint.

Now put 2 to 3 coats of Deltron acrylic urethane paint plus the catalyst that goes with it. Let dry at least 24 hours then wet sand lightly with 1000 grit sandpaper, then paint on your stripes, one color at a time and let stand 24 hours between colors. Lightly sand with 1000 grit before painting the next stripe. Now come back with 2 coats of clear Acrylic urethane. After it dries 3 to 5 days, if there are any dry places or orange peel, you can lightly wet sand with 1500 grit sandpaper and buff and polish it out.

Now for the wood wings and instrument panel. You use the same method as you did for the fiberglass except we used Deltron clear and the actuator that goes with it (thinned 100%) so it would soak thoroughly into the wood. When this dried it acts as our sealer, then we went ahead and finished from here like we did the fiberglass. So far our paint is still looking like it did the day we finished it.

All these materials are manufactured by Ditzler Paint and can be purchased at any store that carries Ditzler products. Also, this is a very easy sanding primer that was used on the airplane. I know this sounds like a long drawn out affair, but it really isn't. Gook luck to all of you Pulsar builders and don't give up as we plan to see your at Oshkosh '90.

FROM THE FACTORY:

My heartiest congratulations go out to Harry Jones on the first flight of his Pulsar. Harry has been one of the key builders in the early Pulsar development, especially the first big revision to the construction manuals. His creative input, continual support, and patience have been overwhelming. Thanks Harry!

A good example of Harry's mature wisdom is his decision about the first flight. He sacrificed the big thrill and all the glory to a very qualified pilot named Joe Costa. Not that Harry is a novice by any means; he has the experience we all romanticize of flying Corsairs from an aircraft carrier in the Big One. But since Harry hasn't flown really light airplanes in awhile, he did the smart thing I hope we all learn from. He found a test pilot who has a lot of recent light plane experience to flight test the Pulsar.

I had the priviledge to fly with Joe Costa last week and he flew our Pulsar so smoothly and carefully I knew he'd be an ideal pilot for a first flight. Sure enough, Joe did a terrific job all the way from a very tough inspection and lots of taxi tests, to a smooth (no show off) first flight. Harry said the only problems were a little brake chatter at 20mph and a little out of roll trim. We'll give you more info. on Harry's Pulsar next time after he has more time on it.

We just returned from the Sun N' Fun airshow in Lakeland, Florida and I'm thankful to report success in all aspects of the trip. First, the Pulsar and Rotax 582 performed flawlessly on the 2400 mile trip. I averaged 132mph TAS and burned 3.7gph auto fuel and 4.0gph 100LL aviation fuel. (The avgas just seems to run a little rich). The weather was so smooth, I flew much of the trip hands off, just sitting back enjoying the scenery.

The trip was also a success in sales and exposure. We're now sold out into August and we had big crowds around the Pulsar all week. Also, Jim Campbell (editor, U.S. Aviator) flew the Pulsar for an upcoming article. He was very complimentary and did an excellent job flying the airplane in some rather difficult traffic situations.

I enjoyed seeing many of you at the airshow. I want to thank Mike and Kim McCann and I especially want to thank Don Boyle for his tireless help on the flightline. Don spent long days answering thousands of questions so Phil and I could take breaks to visit our suppliers.

Back at the shop, I have a couple of construction details to discuss. First, a few builders have mentioned the lack of instructions on the flap handle installation. I'm sorry, I failed to send out a revision sheet on that page. If your page 83 in your wing manual doesn't have a sketch of the flap handle on it, please drop me a card and I'll send your that page.

Several builders have expressed concern about starting their project with such a big step as joining the fuselage halves. I agree that a step like that can be a bit overwhelming so I suggest that you do the seat back reinforcement on page 36 and then the vertical stabilizer construction on page 50 prior to joining the fuselage.

For those of you who've received the Rotax 582 already, you will be receiving a new gearbox aft case in a few weeks. Rotax Austria has several environmental test chambers where they continuously run engines on test stands and they have discovered a weakness in the gearbox attachment. Even though their test conditions were much more severe than on the Pulsar, they are very conservative and careful, and they are going to replace all the gearbox aft cases on the 582 engines. They say that the replacement part can be installed in just a few minutes very easily. We'll change ours out when the parts come and let you know if any special instructions are needed.

I've had a chance to inspect a few Pulsars recently and I'd like to write a few words about quality. Most of the airplanes I've seen are absolute works of art. The lay-ups are neat and free of air and the fit of the parts is superb. In fact, I haven't seen a Pulsar where the overall workmanship was a problem. My concern is really about mistakes and the repair of those mistakes. First of all, in a project as complicated as building an airplane, everyone is going to make a few mistakes. I'll bet I've made more than any of you. The important point is that we talk about your repairs. We have a lot of experience and we want to help you. Nobody at this end is going to criticize a mistake. In fact, some of them are our fault. In some cases, my instructions just aren't very clear or the parts just don't fit very well. But, who ever's fault it, it's your responsibility to tell us about it. I can't overemphasize how important this subject is. If you have any problems with fit or function or any repairs or just plain questions, don't even hesitate or delay in calling us. There is no doubt in my mind that if we work together on your Pulsar, you'll have an absolutely safe airplane. It's a tough little machine if you build it by the book. I know you're going to love the way it flys and have years of joy with it.

CONCLUSION:

That's all for this issue. Thanks to everyone who sent information in and thanks again go to Lavern for her very interesting reivew of her Pulsar and the finishing process. We look forward to hearing from others on their finishing process.

Anyone who hasn't subscribed to Pulsar News and wishes to can send $10 for one year to PBA at our address shown below.

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Mike McCann, editor

Pulsar News

News, Updates, and Developments for Pulsar Builders and Owners

Issue No. 5 *Published by the Pulsar Builders' Association* *July, 1990*

Opening: This issue represents the last time we'll communicate prior to Oshkosh '90. As was noted in the last issue of *Pulsar News*, we'll be having two Pulsar forums this year so be sure to attend. Please confirm the times in your Oshkosh program. We look forward to seeing a lot of you there!

In addition, please note that Kim and I have recently moved to Scottsdale, AZ. I know that it's the wrong time of year to move to AZ. (it was 120 degrees today) but we took the plunge. For the time being, please mail all correspondence to:

PBA
P.O. Box 13941
Scottsdale, Arizona 85267

I've had my fill of trying to mix epoxy in the middle of a snowstorm! I also invite anyone pasing through AZ. to please call us. I'll print our new telephone number just as soon as we get one.

Pulsar Builder's Status Report: Finally, as promised!!! I've noted the building times where they were included. Keep the reports coming.

Enrique Vazquez	La Piedad, Mexico	Completed/Flying
Lavern Lawrence	Loco, OK.	Completed/Flying
Harry Jones	Vineyard Haven, Ma.	Completed/Flying
Pat Keesler	Appleton, WI.	Preparing for painting
Dale Frondal	Danville, Ky.	Fuselage kit-almost complete Wing kit-in progress
Stan Buchholtz/ Derek Ferris	Mystic, Ct.	Fuselage kit-95% complete Wing Kit-100% complete Engine-installed Preping for painting (1,200 hours to date)
Bob Taylor/Tom Hine	Old Lyme, Ct.	Wing/Fuselage kit-90% complete. Engine kit-not installed Instruments-not installed (750 hours to date)

Mike McCann	Scottsdale, AZ.	Fuselage kit-80% complete Wing kit-50% complete Engine kit-not installed Enough money--BARELY!! (400 hours to date)
George Wright	Schenectady, NY.	Fuselage kit-60% complete

Add'l comment: George is using MATCO brakes & wheels and is using 13x6.5x6 tires (mains) and a 11x4x5 nose wheel. George also has a new nose wheel bracket designed for grass landings. Also, he agrees that the Radio Shack strobe should be avoided.

My apologies if I'm off in estimating percentage completions based on your comments. Also, if I've missed anyone who has sent in a progress report, please bear with me as we're having a rough time keeping all of the mail in one state!

Transponder Antennas: Several builders have asked about transponder antennas for the antenna kits mentioned in a previous issue of *Pulsar News*. I admit that I've been pretty busy lately and was unable to develop the transponder kits for the Pulsar, but we've finally got the parts together and the design is based on the January, 1981 *Sport Aviation* design. We have, however, opted to use 2024-T3 aluminum for the increased strength. If you'd like one of the transponder antenna kits, just send Kim $13.00 which includes postage (send to the new address on the front page). Or, for anyone who wants the complete VHF Com/Nav/Glideslope/Marker Beacon/Transponder antenna kit for the Pulsar, it's $35.00 postage paid .

Loran Information:

Although this information is a bit dated (Professional Pilot, July,1989), it is one of the best comparisons of the entire II Morrow Loran line. Given the interest many of you have in installing LORANs in your Pulsars, I thought the chart was worth including. If any of you have similar info. on other avionics, I'll gladly include it in future issues.

II Morrow loran comparison chart

Model	List Price	Warranty	IFR Cert	Display	User Wpts	Flight Plans/ Legs	Database	Airspace Alert	"Nearest" Search	Data Port	Remarks
612A	$3295	26mo	Yes	LED/DM	100	1/2	48 US: Fed desig apts, VORs	No	1:apt	Yes	II Morrow's original db
612B	$2695	26mo	No	LED/DM	100	1/2	49 US, Can: P/U apts w/rwy 2500'+, Fed desig hel, seo, VORs	No	1: apt. VOR, user	Yes	
604	$1795	26mo	No	LED/DM	100	1/2	No	No	No	Yes	Dead reckoning function
604TCA	$2295	26mo	No	LED/DM	100	1/2	Same as 612BCV plus NDBs	All SUA	5: apts. VORs, user	Yes	User-updatable db
604AC	$2495	26mo	No	LED/DM	100	1/2	Alaska, Can: P/U apts, VORs	No	No	Yes	
618	$3295	26mo	No	LED/DM	500	1/2	50 US, Can: P/U apts, US mil apts, Fed desig hel, seo, VORs. NDBs, ints	All SUA	25: apts, VORs, NDBs, ints, user	Yes	II Morrow's largest db
618C	$3995	26mo	No	LED/DM	500	1/2	Same as 618	All SUA	25: apts, VORs, NDBs, ints, user	Yes	Round version of 618
618R	$5995	26mo	No	LED/DM	500	1/2	Same as 618	All SUA	25: apts, VORs, NDBs, ints, user	Yes	Remote-mounted version of 618.
614R	$6995	26mo	Yes	LED/DM	100	1/2	Same as 618	No	No	Yes	Remote-mounted version of 612A

KEY: apt = airport; db = database; DM = dot matrix; hel = heliports; P/U = public use; rwy = runway; seo = seaplane bases; seg = segmented; SUA = special use airspace

From the Factory: For two years people have been asking about a Pulsar with a four cycle engine, and for two years we've been telling them it's not worth it. The light weight, simplicity, and economy of the Pulsar all depend on the Rotax 582 and all three advantages would be compromised with a four cycle engine. Not only that, we believe that the proven 582 is just as reliable as any homebuilt installation of a four cycle engine can be.

Well, we still believe all that but....some people are willing to accept the compromises and they just won't accept a two-cycle engine. For those people we have good news. We've been watching the Rotax 912 for a long time and it has enough size and weight advantage over other four cycles that we've decided to try one in a Pulsar. In fact, one of our most talented (and patient) builders, Rick Meyer from New Braunfels, TX. is working with us to install the 912 in his Pulsar. We call it the Pulsar XP.

At this point (in late June) we have the engine installation just about complete and we're into the surface finishing prior to painting. Our goal is to have this airplane on exhibit at Oshkosh, even though we probably won't have time to fly it before Oshkosh.

For your general interest, the dimensions and thrust line of the 912 require a complete new cowling shape. To accommodate the extra weight up front the fuel tank must be installed in the wings, not in the forward fuselage. Also, because of the weight the wing spars are beefed up. The useful load will be the same as with the 582 but the empty weight is about 50 lbs. more. The cruise speed will be about 140mph and the stall speed about 45mph. Take-off and climb performance will increase somewhat. The largest compromise with the 912 is cost. With the premolded wing tanks, three blade prop, and extra installation hardware, the 912 will cost $5,000 more than the 582.

That's a big crompromise for a four-cycle engine, but I don't want to be too hard on the 912. All the people that we've talked to that are flying the 912 just love it. It is already certified in Europe which puts it in a whole new class. Being a four cycle, it does have better specific fuel consumption than the 582. It will cruise 140mph on the same fuel flow that the 582 will cruise 130mph. Also, it will have a longer TBO. We hope to let you know how it flies in the next newsletter.

Now for some construction details. Chuck Stroh from Oklahoma City pointed out a problem that apparently affects every Pulsar shipped to date. The horizontal stabilizer shells are about 1/8" too thick for the 1-7/8" aluminum spar tubes. The shells are flexible enough that a few pounds of weight will force the shells to contact the spar tube over most of the length of the spar tube. However, near the root of the stabilizer, the shells are too stiff to force down to the tube and a possible gap could result if the epoxy runs out of the joint during construction.

Structurally, the stabilizer shells must be bonded to the spar tube over at least 90% of its length. The following inspection must be performed on all Pulsar stabilizers. First, draw a line on both surfaces of both stabilizers over the center of the spar tubes. Use a coin (like a quarter) and tap gently every 1/4" along the line. Mark any areas that ring (like a hollow sound). Next, drill a 3/16" diameter hole through the shell over the spar tube in the areas that sounded hollow. Don't drill through the spar tube. Use a piece of safety wire with a small "hook" on the end and feel for any gaps that might be present. If your coin tap test doesn't reveal any suspect areas you

still must drill at least one hole. The most likely void area will be on the bottom of the stabilizer, close to the root end. Drill your hole 1-1/2" from the root and check for gaps. If you find no gaps or ringing, you're ok, just fill the holes with micro. If you find gaps, call us for a repair procedure.

If you haven't built your stabilizer yet, call us to send you a 1/8" thick strip of foam to put in the gap. All stabilizers shipped from June, '90 on will have a foam spacer strip manufactured into the upper shell over the spar area to solve the problem.

The next problem is on the nose gear strut. The nut that holds the castor fork on the strut tends to drag against the tire. The solution is to file the corners of the nut to clear the tire.

The flap speed limits are not published anywhere. Add these flap speeds to your operating manual. Full flaps (35 degrees)--limit 65 mph. Half flaps (second notch)--limit 75 mph.

The fuel tank gussets shown on the pattern drawing were not mentioned in the early manuals. They should be bonded and glassed under the aft corners of the fuel tank.

The wing manual does not describe how to install the rudder cable end fittings on the aft end of the cables. After you cut your cables to the correct length to fit your airplane, send the cables and end fittings to us and we'll swage the fittings onto the cables for you.

A final construction point concerns the joining flange on the fuselage and empenage. The bond area in the joining flanges will support ultimate flight loads with a large margin of safety. However, concentrated handling loads during construction can "pop" small sections of the joining flange apart. We suggest that you reinforce the joint inside the shell with one layer of 2" glass tape in the following areas:

1. On the firewall flange, top and bottom.
2. On the frame just aft of the cockpit where the canopy meets the fuselage.
3. Just forward of the cockpit where the instrument panel will go. Also, to reinforce the bottom of the fuselage so you won't damage the flange when you have to climb in the aft fuselage to install the aft bulkhead, lay a 1" strip of 3 oz. glass the entire length of the joint on the outside of the fuselage, along the bottom. The joining flanges on the stabilizers and rudder generally don't need reinforcement unless you sand a little too heavy along the joint during your finishing process. In that case, use a 1" wide strip of 3 oz glass as you did on the bottom of the fuselage.

Conclusion: Well, that's all for now. Happy 4th to everyone and I look forward to seeing many of you at Oshkosh!

Pulsar Builders' Association
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Pulsar News

News, Updates, and Developments for Pulsar Builders and Owners

Issue No. 6 | Published by the Pulsar Builders' Association | September, 1990

Oshkosh/Pulsar Recap:

Let me be the first to say how Kim and I enjoyed seeing all of you who had the opportunity to get to Oshkosh this year. It's really great to talk to other Pulsar builders and have the time to swap building stories/suggestions/modifications. I want to encourage all of you that I spoke to to write us with some of the information you shared at Oshkosh. I'll be sure to get it into *Pulsar News* and everyone will be most appreciative. Since we have a lot of information to get out in this issue I won't waste anymore space! By the way, this issue is obviously devoted to all the **Bob's** out there building Pulsars (read on to see why).

Tool Suggestions *by Bob Taylor*

Tom Hine and I feel that you should really have a bit more tools than Mark lists. The Dremel Tool is very helpful and should be a variable speed model. Dremel's "Super Duty Fiberglass Cut-off Wheel" #426 is recommended. They come in a package of 5 and don't shatter. A single disc will last a long time. The other Dremel item we used a lot was the Drum Sander #407 with Drum Sander Bands #408 and #432. The next item on Mark's list was a saber saw which seems to "tear" the fiberglass even when using a fine tooth blade. We found a band saw with a fine tooth blade worked well for those cuts where a band saw was practical. The next item that saved us a lot of time was a bench type stationary disc sander turning at a slow speed with medium or fine sandpaper. This made it very easy to finish parts to a fine line and have a perfectly square edge. We use this all the time in fitting parts.

The next item we feel is a must is a pair of Cleco plyers and about 18 1/8" Cleco fasteners. You will really appreciate them when you build the ailerons and flaps. You should be able to purchase this item for about $15.00 or so. The last item to mention was a 3/8" variable speed reversible electric drill. A a very slow speed you can drill the lead counter weights without plugging up the electric drill bit. The very slow speed is great for starting holes and careful drilling. We also found it handy to use a drill press where a perfectly 90 degree hole was required.

Fun "Stuff" For Your Pulsar *by Bob Murawski*

Let me tell you about the J.C. Whitney Company. This company has a lot of things that could be used in the outfitting of a Pulsar. For example, they offer two strobes; one is a 2.75" x 4.25" 100,000 candle power strobe costing $17.96. The other strobe is 4.5" high, is 1,000,000 candlepower and costs $53.96. Whitney is primarily for cars, but they have some neat stuff like velour storage pockets (9x13" only $6. and 5.5x3.5" only $3.50). They also have aircraft style interior light for only $5.00 and various other items including electronic fuel level gauges, alarm systems and pinstriping tape. The address is:

J.C. Whitney & Company (312) 431-6200
1917-19 Archer Avenue
P.O. Box 8410
Chicago, IL. 60680

Builder Report *by Bob Vaughn:*

My kit is S/N 146 which was delivered during Dec. '89. Aside from customer options, I've been sent everything (less prop) to complete my project. This has allowed me to devise my own assembly sequence which I believe has some advantages in terms of access and final fit of parts. I'll list, in order of significance, areas and some details where changes have been made (or planned). All mods. have at minimum the verbal concurrence of Aero Designs personnel.

1) Landing Gear - My Pulsar now has the option of either a taildragger or tricycle wheel configuration. Switching gear components is a "nuts and bolts" only job and will provide an absolute performance comparison if we ever get flying.....

2) Brakes - I've installed hydraulic disc brakes (Great Plains) and dual, heel-operated cylinders with reservoir (Hegar Mfg.). Axle modification was simple and cylinder plumbing and mounting (all beneath the floorboard--very solid and convenient).

3) Fuel System - Capacity was increased approx. 1.5 gallons at no expense or noticeable footroom compromise by lowering the tank bottom 5/8". A petcock of motorcycle origin provides a reserve using a 2.5" standpipe for normal supply and an absolute tank bottom source for emergency and water-check use.

4) Dorsal Windows - I decided to omit the baggage door and add a couple small view windows aft of the canopy. After a flight in the prototype at Oshkosh '89, I realized that rear visibility was limited when we were almost eaten by a Bearcat swinging a 4-bladed prop bigger than the Pulsar's wing while we were taxiing. I worked out a complex build-up of doublers and glass with Lexan panels and submitted it to Mark Brown. He ok'd my effort but said it was unnecessary because fuselage loads were small in that area and suggested a much more simple approach which I intend to follow.

5) Gear Fairing - In keeping with the otherwise clean design, I've added symmetrical balsa/glass strut fairings with a chord of just over 6" at the the top. Wheel fairings from Harbor Ultralights fit very nicely over the main gear wheels and brakes. I don't like the stiff, draggy-looking tailwheel...it may change.

6) Antennas - All internal foil/ferrite antennas will supply my limited avionics. I have a com. antenna in the vertical fin and plan on another on one side of the aft fuselage. A loran strip will be on the opposite side and a strip pattern on the bottom of the aft section for a ground plane. I'll probably put nav. and marker beacon elements in the wing.

7) Misc. - I've added Mazda air vents to control cockpit air from the instrument panel outlets. Several conduits of 1/2" diameter plastic drip irrigation pipe were added for wire and tube runs in hard-to-get-at places. Canopy side tracks are located 1" forward of design points to provide a slight amount more "lift" for seal clearance as the canopy is moved from the locked position.

No work has been done on the engine installation. Wing spars are ribless although all inboard beef-up has been done and fuselage/spar mating with the 5/8" pins is complete. I've logged 358 hours which indicates either I'm half done or more realistically, a slow worker just getting started. I spend an awful lot of time just looking at the picture of Mark on top of those clouds!

Editor Note: Thanks to Bob for the update! Let's here from some others of you out there!

Miscellaneous Items/Notices:

1. Since so many people have inquired about building and flying Pulsars, it seems that a database of Pulsar building/flying information would be very useful. And since I have had the pleasure of talking and corresponding with so many of you, I thought I would undertake this task. I plan to keep a computer database of building times, flying performance, operating data, engine

performance, servicing and problems. Obviously this is a long-term project, but I wanted to put a note in the newsletter as some of you have already completed your Pulsars and are getting flying data. When you have a chance, please drop me a postcard to let us all know how it's going.

2) Gary Polizzotto would like to let everyone know that he is interested in selling his Rotax 532 engine (still in the box) for $1,850. If you are interested, you can contact Gary at 404-523-1000.

3) Kim received an order for a nav/com antenna kit on July 19. The problem arose when we realized the envelope and letter had no return address and neither of us could read the name on the letter to know who sent us the order. If you still haven't received your nav/com antenna kit and your first name begins with the letter "J" please drop us a line and sorry for the mix-up.

From The Factory:

We have so much good news this time that I hardly know where to start. I guess first flights are the most exciting so I'll start with those. My most enthusiastic congratulations go out to these guys who have persevered and succeeded in one of the most exciting projects of all; building an airplane. These distinguished fellows are: Malcolm McBride in England, Bon Hartline in Anna, Illinois, Hertriono Kartowisastro in Indonesia, and Rick Meyer in New Braunfels, Texas.

In this new group of Pulsars are a couple of double firsts. Bon Hartline's Pulsar is the first taildragger Pulsar to fly and he says it handles great. His only complication was a serious trim problem in roll and an inoperative airspeed indicator because I forgot to tell him to extend his pitot tube 5" in front of the wing. A simple trim tab on the aileron and a flap adjustment solved his roll problem. We'll let you know how fast it is when he has a few hours on it.

The other Pulsar with a double first is owned by Rick Meyer. His is the first Pulsar (that is "Pulsar XP") to fly with the 80 HP Rotax 912 engine. I was privileged to do the first flight and his airplane was in such perfect trim that I flew most of the first flight hands off while taking notes. Like Bon's Pulsar, we don't have enough time on Rick's airplane to quote performance so I'll have to save that for next time. Early indications are that the XP is only slightly faster than the standard Pulsar and it definitely needs an oil cooler.

The other great news is the trip to Oshkosh. Our Pulsar and the Rotax 582 performed flawlessly on the 2,700 mile round trip. My only problem was the rain (again). I was too cheap to take a production prop out of stock so I didn't have the plastic leading edge protection. The rain eroded the wooden leading edge so badly that I lost about 5 mph TAS at 6000 rpm. Like the trip to Lakeland last spring, I burned about 4 gallons of fuel per hour.

The really fun part of Oshkosh each year is meeting with many of you. I know I get kind of tired out so I might not seem all that thrilled, but I really do enjoy seeing each of you. Ya'll are the best group of builders and friends that I could ever hope for. Not only that, ya'll are such good salesmen, that our production schedule is now sold out into February, 1991. Welcome aboard to all you new guys.

While at Oshkosh, I mentioned to many of you that I was testing a new ground adjustable prop from GSC Systems in Canada. This prop has one of the best performance reputations in the business so I decided to give it a try. Well, it is a good prop, but not any better than the Peery prop we're using so we'll stick with the local source. Actually, the Peery prop is a little faster than the GSC prop because Peery designed the planform to lower the static load and maximize pitch.

I have a bit more info. on brakes that I'll pass along. Rick Meyer installed the Matco hydraulic disc brakes on his Pulsar so I had a chance to compare them with our standard mechanical drum set up. The Matco brakes are definitely smoother, but actual stopping power compared to brake peddle pressure is better with our standard brakes. The Matco brakes will cost around $300

extra with master cylinders and require a separate fluid reservoir and special axles which also add cost and complexity. Also, the longer axle for the Matco system moves the wheel pant away from the gear leg causing more aerodynamic drag. I know the standard brakes are a little more tedious to adjust, but I still think they are the best choice.

Now on the subject of improvements: We recommend a more positive method of securing the hinge pins in the aileron, flap and elevator hinges. Instead of using a dab of silicon adhesive on the "bent" end of the hinge pin as called out in the manuals, we recommend that you cut the "bent" part of the hinge pin off so that the pin will slide completely into the hinge. Then drill through the hinge (#60 drill) close to each end and tie a piece of safety wire through each end of the hinge to mechanically trap the hinge pin.

On the aft canopy frame, the manual says to "slit" the uni-glass to help it follow the curve of the frame. Rick's aft frame developed cracks at these slits. To prevent these cracks, you should either reinforce the slits with short pieces of uni-glass or just cut the uni-glass into 4"-6" long pieces where necessary and overlap the pieces 1/2".

A few builders have been confused about the four different types of raw fiberglass supplied in the kit. We send a piece of 3 oz. glass (broadcloth), a piece of 9 oz. glass (also broadcloth--and heavier), a piece of uni-glass (even heavier with all the fibers running one direction), and several linear feet of glass tape (2", 4", and 6" wide). All the glass is defined in the fuselage manual and specifically called out in the text except the 9 oz. glass broadcloth. The 9 oz. broadcloth is not actually called out in the manual, but can be used as a direct substitute for the glass tape where curves in the structure cause the tape to buckle or gap. The 9 oz. broadcloth is a special "crowfeet" weave that drapes over compound shapes easier than the plain weave in the glass tape.

Finally, we've had two fuel line problems. Lavern and Jim in Loco, Oklahoma developed a crack in the fuel gauge tube (in flight!). They said the tube was the one we supply in the kit and it was about a year old. Squeeze your fuel gauge tube before each flight and if it gets stiff then replace it. The second problem was on Harry Jones' Pulsar. He found that one of the hose clamps had cut into the fuel line so deep that it almost failed. Inspect all the fuel lines at the clamps for cuts, and don't get the clamps excessively tight.

Conclusion:

That about wraps up our 6th issue of *Pulsar News*. I want to thank this month's contributors and encourage all of you to send in any pictures, building tips, and even articles describing your experiences building part or all of your Pulsar. We are going to make screens of all photos so that they'll reproduce better in the newsletter and make pictures worthwhile. Black & while photos are preferred, but color will work fine too. Also, since we now have numerous Pulsars flying, how about some reports from those of you who are winging around the countryside. We're all anxious to hear from you. The mailing address and telephone number are listed below for your use. I look forward to hearing from you. P.S. I was embarrassingly late in responding to a few of you who wrote with questions. Our 1,600 mile move to Arizona over the last 3 months has left me only somewhat sane! Thanks for your patience. We'll be returning to normal during the next few weeks (I hope!).

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Pulsar News

News, Updates, and Developments for Pulsar Builders and Owners

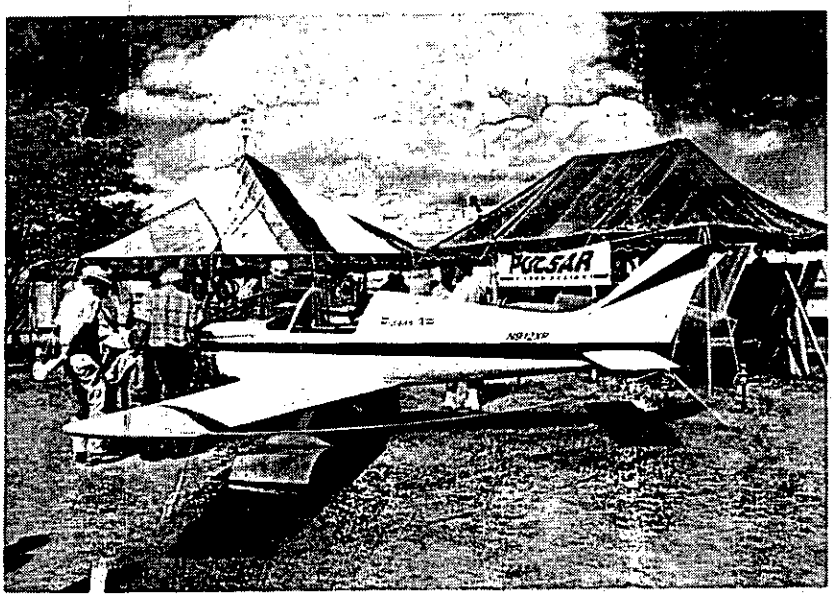
Issue No. 7 | Published by the Pulsar Builders' Association | November, 1990

Opening:

Greetings again to all of you. As you may have noticed, we've changed the printing format slightly in this issue. Although I'm a big fan of consistency, I've decided to change from the previous "newsletter" format to the 3 hole punch paper to allow everyone to keep the newsletter more conveniently in an inexpensive 3 ring binder. Also, it is my intent to expand the number of pages in future newsletters as more builders start flying and submitting pictures. This new format is much less restrictive in the number of pages per issue. As always, I appreciate any suggestions and comments.

Oshkosh/Pulsar Recap:

Better late than never. I have promised to start including some pictures in *Pulsar News*, but it seems to take forever to finish a roll of film. Picture 1 was taken in front of the Aero Designs tent at Oshkosh '90 and shows Rick Meyer's beautiful Pulsar XP on display. As you may be able to see in the picture, groups of interested builders constantly surrounded the XP's open cowl section to view the Rotax 912 and its installation.



Inside the Aero Design tent was a Pulsar fuselage right out of the box to show future Pulsar builders what to expect and the ease of construction.

Picture 2 shows Bon Hartline in front of his impressive Pulsar taildragger. Bon was the first builder to have a taildragger version on display at Oshkosh '90. Mark Brown commented that he was glad to see Bon's plane as it was his (Mark's) first chance to actually see what a Pulsar taildragger looks like. Mark reports that visibility was even better than expected. Performance reports to follow.

Builder Reports:

Niley Church (Wichita Falls, TX)
"After completing 100% of the fuselage manual and 70% of the wing manual, I did something that should have been done at the start of my Pulsar project -- I purchased a Dremel type rotary tool. However, mine is called a Craftsman Rotary Power Tool (Model #9), sold by Sears for $49.95 versus Dremel's nationally advertised price of $99.96. Sears carries a full line of "Craftsman" accessories (also made by Dremel) and much less expensive. Even at this point in construction, the tool has "paid" for itself in reduced effort and improved efficiency.

The main part of this builder report focuses on the horizontal stabilizer construction/installation (pp. 94-102 in the wing construction manual). Due to accumulated dimensional error in prefab glass shells and fuselage cut-out scribe marks (and due to builder dimensional error) the following sequence is proposed:

> Install the horizontal stabilizer splice tube into the aft fuselage prior to bonding the stabilizer torque tubes to the upper shells. Fit the torque tubes into normal position in the splice tube (hopefully the fit will require a dab of grease). Then place the upper stabilizer shells in place, flush against the fuselage, and maintain position while torque tube position lines are drawn both fore and aft of the tube on the inside shells surface. Continue horizontal stabilizer construction according to manual specifications.

The revised process should allow each builder improved gap control, fore and aft, between the horizontal stabilizers and the fuselage upon final assembly".

Harry Jones (Vineyard Haven, MA.)
"I've had an incurable problem with my Rotax engine; specifically a rough and missing engine. I've read everything, tried everything, and talked to Mark and others. Green Skies and Kodiak have both worked on the engine, although problems remain. The people at Kodiak were most friendly and knowledgeable, but a quick turnaround wasn't in the cards. So far they've found one factory problem and one part problem relating to replacements parts. The problem has been going on since January when the engine first ran. Perhaps if you can find other owners of Rotax engines living near you, you can see and hear how a Rotax should operate. (ed. note: Harry was very clear to warn everyone about purchasing Rotax parts from dealers. Like so many things, parts which appear to be identical may not be when it comes to performance and tolerances! Be sure to get any repair/replacement parts from a reputable Rotax dealer).

Also, have any of you fellow Pulsar builders built a good cabin heater which works yet or has a lead on a good source of information"?

(Harry included several very interesting pictures which will be included in the next issue of *Pulsar News*. Thanks Harry!)

Bill Buffe (Akron, OH.)
Bill reports that his Pulsar is complete and is in the taxi testing stages. Good luck Bill and safe flying!

Bon Hartline (Anna, IL.)
Bon was kind enough to drop me a line with his initial flying report. "As of now, I have 12 hours on the Pulsar and "we" are getting along just great! At about 6000 rpm I'm getting 130 mph and I just relax and don't even have to use rudder in turns. I really enjoy it! I'm taking it to an airshow in Missouri. I'll let you know soon on some actual flight figures."

Tom Hine & Bob Taylor (Old Lyme, CT.)
"We're about 750 hours into the Pulsar project and about 60% complete I would guess. Bob Taylor and I both worked too hard at other things this summer, but hope to get going again this fall".

Gary Polizzotto (Decatur, GA.)

Gary reports that the airframe and wings are basically complete at this time. He has suggested that a tee be placed in the fuel line to drain off water and particulate matter. Placement of the tee is left to you the individual builder; either off of the fuel valve or at the low point of the fuel gage. The drain line could be routed just forward of the seat support bulkhead and the drain could be placed directly under the fuselage.

In addition, Gary has installed a fire resistant fuel line forward of the *firewall and* 0.125" Fiberfrax covered with aluminum will be used as a real firewall covering the entire aft engine bay.

Miscellaneous Items/Notices:

I need to print several misc. items to get everyone caught up.

1. In Issue #6, I printed the incorrect telephone number for Gary Polizzotto regarding his interest in selling a Rotax 532 ($1.850). The correct telephone number is 404-634-7811. Sorry Gary. Also, Gary has told me that he has a friend (George Gary--404-242-4733) who is interested in buying a partially-completed Pulsar. Please feel free to call George if anyone is interested. (Gee George, I may be interested if I don't start spending more time on my Pulsar---just kidding).

2. Welcome to Martino Bonicelli. Martino wrote to me and wanted to say hello to all of the PBA friends; "I'm writing from Italy, exactly from Rome, and I think I'll be the first Italian Pulsar builder. While writing this letter, my Pulsar crate is leaving San Antonio bound for Europe. The emotions of this wait are great--as great as the satisfaction of my choice." Welcome aboard Martino and we'll all wait to hear more on your Italian Pulsar!

3. George Gennuso has asked that I update all of the Pulsar builders on his fuel tank construction modifications which were noted in a previous issue of *Pulsar News*. As you may recall, George had developed a modified construction procedure to avoid having to remove the instrument panel for fuel tank construction and installation. George has pointed out that the Pulsar construction manuals have been modified so that his instruction sheets are no longer necessary. George is still getting a lot of requests for his instruction package, but all the changes have been incorporated into the actual construction manuals. Thanks go out to George for his efforts to share his information with all of us.

4. We've still got several Pulsar hats available from Oshkosh '90 for anyone who is interested. They are grey with the Pulsar design printed in maroon. It was fun to see people walking around Oshkosh with their Pulsar hats (and the Pulsar hats can stand up to those Glasair and Lancair hats anyday!) They're $7.00 each and please include $2.00 for shipping. Please send any requests to Kim at the PBA address.

From The Factory:

We have more congratulations to send out this period. Glen Huff of Kansas City has turned from a Pulsar builder to a Pulsar pilot this month. His first flight was a little exciting because his airspeed indicator didn't seem to be working at first and he couldn't seem to slow down enough to get back on the 1600' runway he took off from. I think he spent most of his first half hour of flight time just trying to get back down. Glen says speed control is still his biggest problem, but all airplanes take a little practice to slow down. His next worst problem is that his water temperature is too cool. He's going to try a heater control valve in the radiator hose and let us know how it works (Glen's a very creative guy).

I put a few hours of mountain flying on the Pulsar prototype last month as I traveled to Prescott, Arizona to the Copperstate Flyin. I flew much of the 1000 mile trip to Prescott above 11,000 feet and the engine didn't seem to mind breathing the thin air at all. The mixture was a little rich, giving about 900° on the EGT, but the engine ran smooth and clean. Take off and climb performance at the 5000' elevation of Prescott was still very good. I rolled about 1000' on takeoff

and climbed at 1000 ft/min. That should encourage some of you who'll by flying around the mountains. Thanks to the McCanns and Colliers for making my stay in Arizona so pleasant.

During some routine production testing I found a couple of problems to report. First of all, the small conical air filters that we send with the kit don't seem to allow quite enough air to the engine. Compared to the large conical filters from Rotax, the engine runs about 100° cooler EGT on takeoff with the small filters. I couldn't measure any difference in actual takeoff performance, but I'm sure the larger filters would help the takeoff power a little. Since the difference is so small, we don't plan to replace everyone's filters, but you should still be aware of every improvement possible.

The second problem I found was a production prop with slightly too much pitch. On a 90° day in September, I was randomly checking production props and experienced an engine overload like I used to have on the old Rotax 532. We sent the prop back to Peery and he said it was definitely cut with too much pitch. The only good way to check your prop is to try a take-off. If your engine maintains 6000 rpm throughout the takeoff, you're ok. However, if your engine starts out at 6000 rpm, but "loads down" to about 5000 rpm at about 40 mph, you'll have to send the prop back for rework. This is another good reason to do your first takeoff on a long runway.

In the last month or two we've experience a severe increase in shipping costs due, in part, to the increase in fuel costs. We've suffered the effects on our incoming shipments but I need to warn you that you're also in for a disappointment on your kit shipment cost. The average over the last several kits has been about $550.

In response to a couple of builders who've developed an allergic rash to epoxy, we've done a series of bond tests with vinylester resin. The results on composite material were ok, but on aluminum the results were totally unacceptable. The best solution is still to avoid breathing the epoxy vapor by using a carbon filter respirator and wearing long sleeve clothing and good gloves. Also, during clean-up, don't ever wash your gloves and hands together in solvent. The solvent opens your pores and the residual epoxy will go into your skin. Lastly, you must ventilate your shop even in the cold weather.

On the subject of bonding, we've started adding a blue dye to the epolite hardener to make trapped air bubbles more visible in your lay-ups. The dye does not affect the strength of the bonds and all mixing instructions and cure times are the same.

Well, that's all the news from this end. I just want to thank all of you for your continuing concern for safety in the construction and operation of your Pulsars. Keep it up!

Wrap-up: Thanks again to all the contributors. Pulsar builder Gary Polizzotto has asked me to remind the growing number of Pulsar pilots to send in their flight evaluations and performance data for all the builders to read. I will also be printing an updated PBA membership list (which includes both current and prospective Pulsar builders) in either of the next two issues. I'll plan to include addresses (but no telephone numbers) to encourage communication among the builders. If anyone wishes to have their address omitted, please let me know.

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