

PAZMANY NEWSLETTER
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SPRING IS HERE - at least it has a temporary hold in eastern Wisconsin as I write this - and I hope it has arrived for the rest of you northern hemisphere FLers also. For those of you who are building, hopefully you have a bit more light in the evening to get a little more work done on that PL-1 or -2, and for those of you who have your projects completed, now you can get out and do a little flying in the evenings, perhaps. For my "down under" subscribers, well, what can I say - you have my sympathies. Look on the bright side: I don't know about your aircraft, but at least mine has the best cabin heater of any airplane I've ever flown! Get a good heat muff for your airplane (believe mine is stock from a Piper Colt originally) and winter will hold very little inconvenience for you, so long as you can keep the ice and snow off your bird.

Speaking of which, N75PL now has a roof over its canopy, in the form of a more - or - less permanently installed Port - A - Port hangar. The airport people installed ten of these for single aircraft plus a couple more larger ones, and my name was on the list. Costs more than tying down outside, but it's worth it in terms of peace of mind (we've already had a couple thunderstorms go through this spring, with hail) and electrical power is also available, which makes it much easier to work on the ole PL. A hangar is highly recommended for your pride and joy, if at all possible in your area.

Unfortunately, my work schedule has picked up a bit again with the arrival of spring to the northern climes, which leaves me with little time to work on or fly N75PL. About a week ago, as I write this, I started doing some work on the PL, planning to finish it up during the next week and ready the airplane for its annual before I got busy again. Wasn't it Robert Burns who said something about "the best laid plans of mice and men often gang a-gley"? In any case, he must have been planning on doing some work on his own aircraft when he came up with that. I now have half the floorboards out of the cockpit in preparation for removal of the rudder pedal and brake assembly, and now I have no further time to work on the project - I was called back to full time work with one hour's notice the following Monday. So now the PL is temporarily unflyable, with no time for me to get it going again. Very frustrating. Since about 60% of my work is outdoors for the summer, I'm hoping for some rainy days so I can get back to work on it. The money from all that work is nice, but at present I'd just as soon have time to get the PL flying again. Hopefully she'll be ready for EAA Convention, July 26 to Aug. 4 this year. But be forewarned, with my schedule as it is now, this will be your last newsletter until after the EAA Convention.

Onward to other news. Last newsletter I mentioned some

experiments I was going to try to pick up a little speed on the top end for the PL - namely, reflexing the ailerons and installing gap seals on all control surface hinge lines (except the rudder). Well, the experiment was a partial success. I didn't get all the speed I was hoping for, but I did pick up enough to be detectable. Surprisingly enough, I also gained a bit in rate of climb, too, although just how much I can't say, since I had never checked it that accurately before these modifications. I would make an educated guess that the initial climb rate was improved by close to 10%, however - under similar conditions (density altitude almost exactly at sea level) the initial climb rate at about 1400 lbs. gross weight is now just about exactly 1000 ft./minute. Used to be doing well if I could get 900 ft./min. out of it.

As for the maximum cruise, this I had checked pretty closely on a couple other occasions and had come up with (within one mph) 125 mph. After first reflexing the ailerons, I checked it again - density altitude within a few hundred ft. of 7500 ft., full throttle, 2600 RPM, = approx. 75% power. I checked time across several section lines, north, south, east, and west, and came up with an average of 125.3 mph. In other words, don't bother. But if you're still interested, the procedure for making this adjustment entails removing the ailerons from the wings so you can get at the rod end bearings and screwing the rod ends in a few turns. Previous to this, my ailerons had just a touch of "reflex" to them anyway, the trailing edges being about 1/4 inch above the trailing edges of the flaps - which were set properly. After this adjustment, I now have the trailing edges of the ailerons just about exactly 3/4 inch above the flap trailing edges - call it 2 cm. for you metric fans. At present, one of the rod ends is within one turn of being bottomed out on the pushrod end, so there's no further adjustment to be made - at least easily. Since the speed gain measured is well within the range of experimental error considering the rough baseline established and the methods used, I'd say offhand that it wasn't worth it. In other words, I'm not sure at all that I gained anything, and I may have even lost a tenth or three. In retrospect, I'm guessing that the airfoil used on the PL-2 just doesn't lend itself to such cleanup techniques as airfoils with less of a cusp at the trailing edge might - I don't really know. On the other hand, it seems to me the climb rate was improved a bit, and other handling characteristics were unaffected (at least to my piloting technique), so the hell with it, I'm not going to bother to change it back to the way it was.

Gap seals are a different matter. This is a fairly simple procedure and does not involve disassembly of any components for those of you with flying aircraft. I purchased some aluminum tape - a two inch wide, sticky backed, heavy foil type of material - and thoroughly degreased and cleaned the undersides of all the hinge lines on all horizontal surfaces. I then applied the tape with liberal use of pressure to make sure that all edges are well sealed to the airplane. Not much point in a loose edge catching the airflow - or anything else, for that matter. And make sure when you do this that you have the control surface deflected to full travel up - otherwise you may find the tape

trying to stretch across the gap and restricting your control travel. For the antiservo tab, this means adjusting the trim in the cockpit to full nose down (trim tab up) position, and deflecting the stabilator to full back stick (trailing edge up) position. After a good, thorough preflight and control check, away we went.

Under pretty much the same conditions as noted above, the speed was checked again, and this time the results were worth the effort. Would you believe a two mph increase for about two hours of work (OK, so I work slow) and \$3.00 of materials? I wish I could get that kind of a return on all the work I do on the PL - I'd love to see a 50 mph increase for 50 hours of work! The speed as checked came out to just about 127.1 mph, so this time around the gap seal experiment truly did pay off. For those of you who feel like experimenting a bit further, you might want to make careful measurements of rate of climb before you try these mods to verify my suspicions about the increase in that department.

How about some numbers for some other PL's out there? As I promised in the last issue, here are some figures for some other birds. The best documented figures I've seen yet for a PL-1/2 are from HAROLD PIO'S aircraft - see newsletter #46, Christmas '74. To sum up, this airplane had a Lyc. O-290G, 125 hp, landing gear wheel and strut fairings, and a low profile cowl. At about 75% power, this aircraft was good for 156 mph! Matter of fact, the numbers for the original PL-1 prototype with only 90 hp, came up to 118 mph at 75% - with a fuel burn of only 5.0 gal./hour, or almost 24 miles per gallon. In other words, maybe we ought to put a bit more effort into airframe cleanup on our airplanes, and get them up into the Thorp T-18 speed range. It can be done! While I'm still on the subject, I was in touch with AL BARTELL who, among other things, told me of a PL-1 owned by J.C. ANTHONY which, by the way, is pictured in Paz's construction manual on p. 91. Al told me that this particular aircraft originally trued out at about 153 mph, but that with some further cleanup could cruise at 160 mph - on a 135 hp. O-290D. This is believable, since this engine is rated at 10 hp. more than Harold Pio's, and the speed comes out to 4 mph. more. Anyone else out there have any more numbers?

NEWS FROM PAZ: I have the unfortunate duty to report on one bit of tragic news, that of the first fatal accident in any of Paz's designs. News seems to travel slowly sometimes, as this occurred way back on June 5, 1983. Paz was kind enough to send me a copy of the accident report and accompanying letter, which he suggested I include in this newsletter - see the following few pages. In summary, it was pointed out in the report that the fuselage sides bowed out upon impact, causing the seat back/shoulder harness attach cross member to pull loose and allow the occupants to move forward. However, I do want to emphasize one point mentioned in the report: Please note that in the next to last paragraph the investigator mentions that "this particular accident was thought to have been non-survivable" in any case. Of course, one will never know, but it seems questionable that the occupants could have survived even if the cross member had remained in place. See the following three pages:

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The founding and representative body
in the United Kingdom of amateur
constructors and operators of ultra
light and group operated aircraft.

Our Ref: FIVW

Your Ref:

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28th January, 1985.

Dear Paz,

Your information concerning the PL2 accident is correct, although this happened back in June 1983. No defect was due to the aeroplane and it appeared to be a question of the pilot losing control. I am enclosing a copy of the information bulletin put out by the Accident Investigation Branch which gives you the full details.

In the next to last paragraph you will see a note concerning the rivets attaching the shoulder harness. I examined these rivets carefully and feel that the AIB could have been a little more explicit. The rivets in fact failed in tension due to the action of the fuselage breaking up on impact. The mode of failure was that the aircraft hit the ground very nose down and this in turn caused the upper longerons to buckle under compression loads. The cross member in the fuselage was then in tension due to the buckling in the fuselage and allowed these rivets to fail in tension due to the fuselage which had already been substantially damaged bursting outwards.

I have put a small sketch at the end to illustrate the effect.

Yours sincerely,

F.I.V. Walker,
Vice-Chairman & Chief Executive

Aircraft type and registration:	Pazmany PL2 (Home-built light single engine fixed aircraft) G-PBAZ BPAZ
Year of Manufacture:	1978
Date and time (GMT):	5 June at 1220 hrs 1983
Location:	Near Barton aerodrome, Manchester
Type of flight:	Private (pleasure)
Persons on board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 (fatal) Passengers - 1 (fatal)
Nature of damage:	Aircraft destroyed
Commander's Licence:	Private Pilot's Licence
Commander's Age:	40 years
Commander's total flying experience:	145 hours (of which 29 hours were on type)

During the morning of the day of the accident, a number of club members decided to fly their four aircraft in company from Netherthorpe (near Worksop) to Barton (Manchester). It was agreed that one of the aircraft would lead the group, and its pilot would be responsible for the navigation. Because of his level of experience, and the relatively high performance of his aircraft, the pilot of the Pazmany was asked to keep well behind the remainder of the group, and there is evidence that he complied with this request.

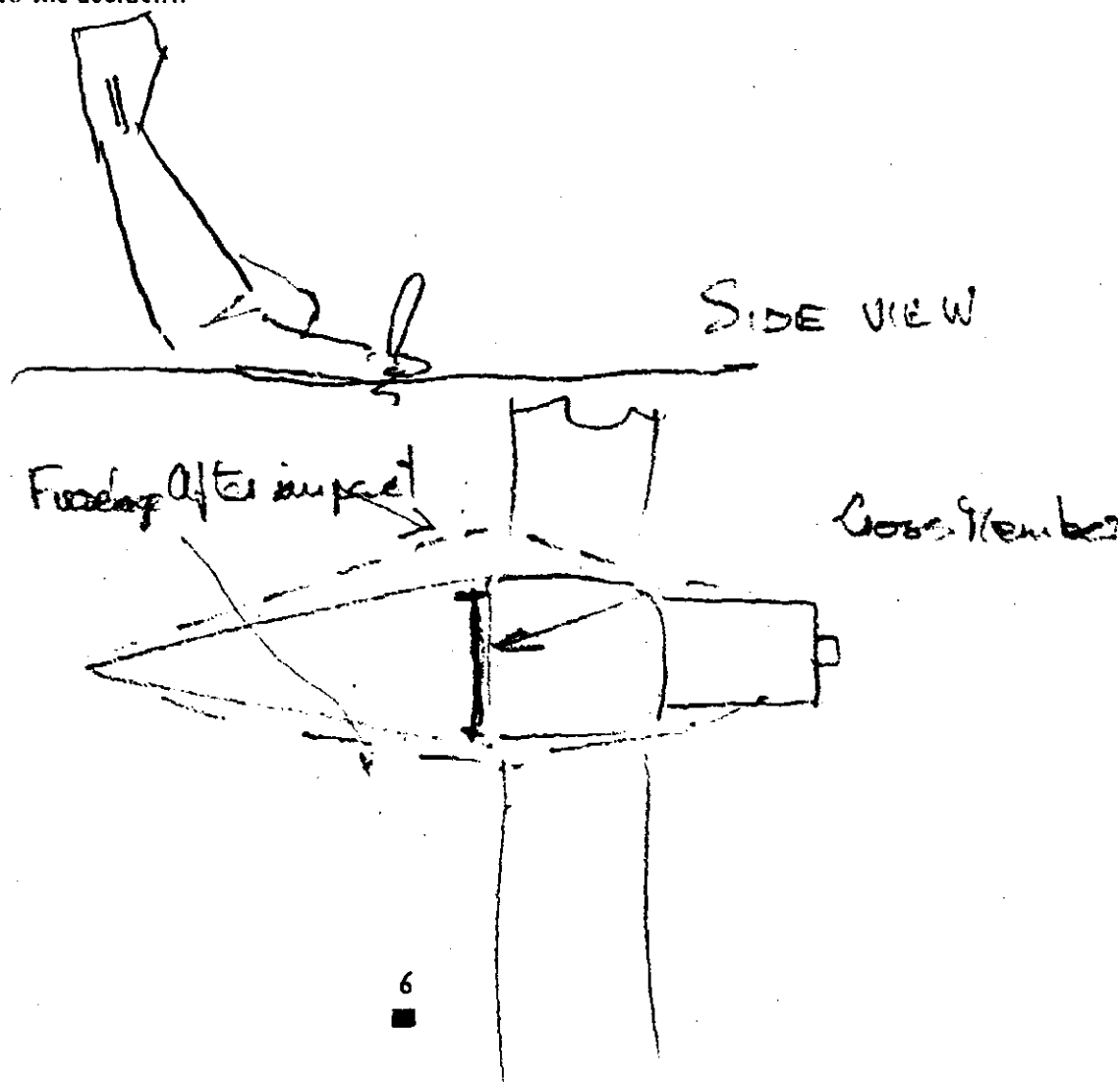
There were doubts regarding the suitability of the weather over the Pennines, and the aircraft flew initially to Crosland Moor (Huddersfield), where, after having landed, the crews discussed the prevailing weather with local club members. After approximately an hour on the ground, it was decided that the weather was acceptable, and the four aircraft took off for Barton. As the aircraft approached the aerodrome, a member of the group suggested on the RTF that the three aircraft in the lead tighten up to overfly Barton and then break into line astern on the dead side of the circuit. They were then to revert to normal circuit disciplines.

The aircraft, approaching from the northeast, made RTF contact with Barton Radio and were advised that the wind was 070°/10-15 kt and the runway in use 09, with a left hand circuit. There was no significant weather.

The three leading aircraft flew overhead in loose formation, then turned left to descend to circuit height (800') on the dead side of the circuit pattern. The Pazmany, which had been well to the rear, also joined the circuit and, whilst turning downwind, overtook successively, the number three and number two aircraft on their left and at a height estimated to be about 100' below them. Shortly afterwards, the passenger in the Pazmany (who had been identified as initiating all the RTF communications), called to the leader: "HAVE YOU GOT US IN SIGHT?". At about the same time, on reaching a point on the leading aircraft's left quarter, the Pazmany was seen to roll to the left. The roll continued until the lateral axis was over the vertical, and the aircraft adopted a steep nose down, descending turn to the left. After a number of turns, which witnesses estimate to have been between 2 and 5, the aircraft struck the peaty ground in a steep nose down attitude. The engine and forward end of the cockpit, up to the instrument panel, were embedded in the soil.

The upper torso restraint for both occupants was secured by very strong attachments to a cross-member riveted to the fuselage. Upon impact, the four rivets securing each end of the cross-member failed and, although this particular accident was thought to have been non-survivable, both occupants received severe head injuries consistent with 'jack-knifing'.

The aircraft had been constructed and finished to a very high standard. After a detailed examination of the airframe and engine, there was no evidence of a malfunction or failure which could have contributed to the accident.



As Paz noted in his letter accompanying the report, this points out that the PL-1 or -2 is NOT stall or spin proof - Paz has never claimed such a thing. Matter of fact, the Taiwanese published the results of their spin tests with their PL-1B prototype, and these were included in newsletter #44 (May, '74). If I see sufficient interest, I'll reprint it in a subsequent newsletter - let me know if you'd like to see it.

On a happier note, Paz also passed along word of his selection as the recipient of the American Institute of Aeronautics and Astronautics, San Diego Section, 1984 - 85 award for Outstanding Technical Achievement in Aerospace Engineering. Congratulations from all of us, Paz - but then, we've known of your outstanding technical achievements for a long while now!

BACK ISSUES: Thanks to LARRY PETERNITH, DON BIDLINGMEIER, and DAVE PANTON, I now have almost all back issues available, including the premier issue, number ONE. As I write this, the only issues I am still missing are #2, 3, 4, 5, and 7. All others are now available, same rate as per current issues. Let me know if you want any.

TECH QUESTIONS AND BUILDING TIPS: Seems that since my PL is flying (my wife probably has some comments on that last statement, considering the amount of time it's been grounded for various "improvements") practically all my emphasis in the newsletter has been on things I've done to keep it flying or make it fly better or whatever; my apologies, I've neglected some pretty good points from some of you builders out there, and there are a lot of you who might appreciate some short cuts in the "how to" dept. One point that has been mentioned by several of you who have corresponded with me is that if you have the room in your shop, build the fuselage on the wing. I can certainly see the logic in that; Murphy's Law states that tolerances will build unidirectionally, rather than tending to cancel. In other words if you have ten parts each with a tolerance of .01", when you put them all together you will end up with the whole thing being a tenth of an inch off, one way or the other. And of course the assembly you want to attach this to is off in the other direction. Building the fuselage right on the wing eliminates the problem of tolerance buildup when you later try to assemble them; you can modify to fit as you go. And this same thing is also true of other assemblies and subassemblies. If at all possible, build them together rather than separately for later assembly.

Another point, raised by Leigh Blake: When cutting sheet metal for skins, etc., allow a little extra to make sure you have enough, then trim later. Otherwise, same problem as above - you make the part to the exact proper size, only to find that it's too small when fitted with the mating assembly due to tolerance buildup on the other part. I'm sure you all know this is the way life works, so try to allow for it.

WALTER BUTLER has a question - maybe some of you can come up with a better answer than mine. Drawing 2-10-009 (wing flaps) calls for a CR-756 and CR-757 Cherry rivet, and these don't seem to be available any more. In looking through my All Aircraft Parts catalog I find similar, but not identical numbers - which leads me to suspect a change in nomenclature by the company, rather than a discontinuation of the specific type of rivet. But

I don't know which would be the proper rivet to use - the old numbers were not listed, much less any equivalencies tables. However, I did call a local AI mechanic who told me that the equivalent Cherrymax rivet would certainly be a legal substitute; they're legal for use on production aircraft as equivalents to solid rivets. Unfortunately, my catalog did not list designations, sizes, etc. for Cherrymax rivets - special order only, prices quoted upon application. In other words, expensive!

And I have a note to the effect that DUANE SEYMOUR has some questions on the heating/ventilation system for the PL-1/-2. Sure wish I could find your original letter, Duane, so I could answer that more thoroughly. However, I will take a few lines here to go into the system on my aircraft a bit. As for cabin heat, as noted above, I believe the heat muff to be originally from a Piper Colt, as virtually everything from the mounts forward is. Since I purchased the aircraft already completed, I can't say with great certainty about many of the accessories. Whatever the system, it's great!! I can say that taxiing out on a ten degree below zero (Fahrenheit), one can feel some warmth from the heater, and it's quite noticeable by the time the runup is completed. By the time we have climbed to altitude we are removing heavy winter clothing - it's a shirtsleeve environment. I have never found it necessary to have the cabin heat control in its fully open position in cruise flight. From the heat muff the system uses standard high temp flexible hose to a fitting at the firewall; no dump valve is installed. With the cabin heat control closed there is some noticeable warmth escaping, but we have never found it to be that objectionable even in the summer; it's pretty slight. The temperatures have not built up to the point of causing deterioration of the hose or other components in a few hundred hours of flying, so I don't feel a dump valve is really necessary, except for those of you who live in warmer climes. One thing I heartily recommend is that you make sure you make everything large enough. The hose and heat valve diameter on my PL is 4 inch, and this seems to be somewhat larger than anything I've seen on a factory built two place. Let that warm air flow into the cockpit with as few restrictions as possible.

The vent system is pretty much according to plan; one might gain some efficiency with NASA style ducts, but I find the adjustable scoops on the lower front of the cabin work fine. The outlets, however, are a different story. I still have trouble believing it from their location, but they are installed in a high pressure area above the baggage compartment. At least, that's the way it feels - I can definitely feel a draft on the back of my neck when these outlets are open. Nice in the summertime, but one of the first things I did after flying the airplane a bit was to make up a couple .016" aluminum covers to fit between the interior trim and the outlet opening. When it gets cold I can slide these closed to stop the draft.

FRANK CUICHETTO mentioned to me a while back that he had some problems in trying to form the flap handle. Seems that every time he'd get it formed, upon inspection there would be hairline cracks in it. Any suggestions out there, or have any of you run into this problem? Is this just a case of a bad batch of materials, as Frank suspects? Has anyone tried using an automo-

tive type parking brake handle? By the time it was modified, it might still be simpler to fabricate the handle as per plans. One thing all of you who are building might consider is more notches in the catch plate for the pin on the handle. In other words, give yourself more selection of varying amounts of flap. You might also consider lengthening the handle a bit to give you some extra leverage; 30 degrees of flap or more requires a pretty good pull on that short handle, especially for us 98 lb. weaklings. I know that one might run into clearance problems with the center panel/throttle/etc. if one lengthens the handle, but if your panel layout allows the room, you might think about it. Frank also is adding a gyro venturi in the cowling, as is BOB BRADLEY - see the photo pages at the end of the newsletter for Bob's layout.

JIMMY COX, serial #185, is making excellent progress, according to his last letter - the only parts/components still to go are the landing gear and engine mount. The gear might take you a while, Jimmy, but it will never break!

GEORGE FARRIGIN is now the owner of one of the better known PLs around, N72KA, the aircraft originally built and flown by the late Ken Arnold. Keep it flying, George, and bring it out to the EAA Convention if you can make it. By the way, I appreciate information like this, as to who owns and is flying which aircraft, etc. I'd like to establish a record of plans serial numbers and builders, and for those of you who are flying, your registration numbers (N numbers for us in the USA). I have a start on this information, but for the rest of you, when you get in contact with me, let me know your serial number/N number, will you? Thanks.

CLASSIFIEDS

AL BARTELL is unfortunately selling his PL-2 project, serial #27. Al says he has been at work on this project for fifteen years; he had contacted me for a list of newsletter subscribers so he could send out his own mailing. All of you on my mailing list should have received a three page letter from Al detailing his project. If any of you missed this, contact Al Bartell, 1153 E. 168th St., Cleveland, OH 44110. Phone (216)486-9265. By the way, at least some of Al's goodies have been sold - I purchased the transponder, manifold pressure gauge, and one oil cooler from him. I understand he had two coolers, however; check with him.

PETE KARMOUCHE has decided to make available kits for PL1 and PL2 wheel and strut fairings. Pete has made up a set of female molds for his own aircraft and is offering to make up identical sets for others. Warning: These will not be inexpensive. Pete sent along a cost analysis sheet worked up by Lee Conlan of Homebuilders Aircraft Associates, and really, Pete won't be making much on his asking price of \$1375. It sounds steep, but for the money you get 26 separate pieces of fiberglass to completely fair in all the gear struts and tires. If you're interested, contact Pete Karmouche, 9 Cranfield Ave., San Carlos, CA 94070. Phone (415) 591-8429. Pete also has available the wing tip/fuel tank leading edge fairings at \$75 per set of two.

SHOW AND TELL DEPT: I have room for a few more pictures from Bob Bradley's project. For those of you who have been keeping up for the last few issues, you've seen some examples of his ideas and craftsmanship already. Most of the shots are self-explanatory, in that Bob has made some notes on them for us. But I'll point out some of the goodies myself. See the next page for the pictures.

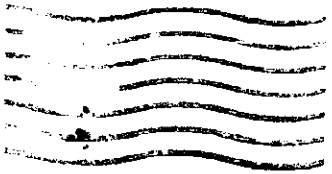
P. 11, upper left: Bob's engine installation. One thing Bob has done in order to make the engine breathe a bit easier is to install a 43 inch long inline muffler from the engine compartment along the bottom of the aircraft.

Upper right: Hopefully you can see what Bob has done with his engine baffles - along with the more or less stock baffling, he has also installed baffles at the base of the cylinders to keep the cooling airflow moving strictly over the cylinder fins. This should cut down on cooling drag a bit, which always seems to be one of the bigger (but less obvious) drag producers.

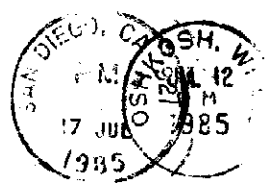
Lower left: Anyone else out there have a Loran-C in their PL? I'm planning on this myself, someday, for N75PL. You can at least see what the antenna looks like when installed on a Mustang (Ford, that is!). As Bob notes, after a repeated 21 mile trip, the error was always within 40 feet! Let us know how it works out in the airplane, Bob - since they operate on low frequencies, I've heard that Lorans are pretty sensitive to ignition/alternator/airframe static/etc. electrical noise, and I'm curious as to how much work needs to go into eliminating these potential problems in an all metal homebuilt.

Lower right: Here's a clever idea - if you're going to install a venturi to run your vacuum gyros, why not install it in the cowling? This way you get drag free gyro operation, and hopefully somewhat better protection from ice buildup in the venturi. I'm interested in how this works out, too, even though I have a vacuum pump on my engine. I know some of you others are interested in this idea too.

Well, that about wraps up the "spring" issue. As you can see, there was some passage of time from the point when I started this newsletter, with its reference to early spring, and now - as I type the last of this, it is now early July. We'll get another issue out ("summer?") after the EAA Convention, and tell you all about it for those unfortunates who were not able to make it. I'll also give you a progress report on the (never ending) installation of Cessna 150 rudder pedal and brake assemblies in a PL-2. By that time, it will hopefully be complete and test flown. Doesn't look like N75PL will be on display at this year's Convention, sad to say; she'll be a hangar queen until mid-August at least, it looks like. For those of you who will be able to make it to Oshkosh, come through the EAA Museum - that's where I'll be any time the Museum is open, the way things are looking right now. Hope to see you soon - or at least get back to you with the next newsletter!



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Your last issue is #N/A

