

8 June 1990



Dear EXPRESS builder,

Many of you have asked for a status report to keep you abreast of the happenings here at Wheeler Technology. I apologize to you for not getting a letter to you earlier, especially in that things have obviously not been as smooth as any of us would like. We've now cleared a major hurdle by getting N210EX up and flying, so I'd like to share with you where we've been, the progress that we've made and what you can expect from Wheeler Technology in the future.

The last year has been a test of our fortitude. Off to a flying start, we were quickly swamped with orders and our start-up production capacity was soon overwhelmed. Our sales quickly leaped ahead of forecast, and we were dismayed to find that we couldn't hire the production people we needed to catch up. As we soon realized, Boeing's sales boom had paralleled ours (last year was their best ever, their backlog jumped to nearly 2000 airplanes). Boeing recruits all the same skills we were trying to attract and had been doing so at the rate of well over a thousand per month (that's 1000/month) for several years, so when we tried to hire people, the results were pretty dismal. (Stoddard Hamilton sold their company to their employees in order to keep workers).

By August we were at the point of desperation and ready to move the company out of state to escape Boeing's influence. By then we had sold nearly 150 kits for the year which was nearly twice our forecast and our production as well as manual production and other critical departments were at dead slow for lack of people. Our one remaining moldmaker, who had resisted Boeing, gave his two week notice so he could become a brewmaster at a local micro-brewery. We couldn't seem to hire anyone--from laminators and prototype mechanics to engineers.

Then Boeing went on strike and at least we got some applications for the moldmaker positions. We hired some of those guys temporarily until the strike was settled, and in the meantime picked up some others from a Boeing sub-contractor. Our mold department then began to produce again so we could move ahead with production. The city of Tacoma jumped in to help by recruiting laminators and by sponsoring a training program. We could quit training on the job, which had caused lots of turnover and scrap. By early October we were beginning to make progress in most areas, and had even started construction of our retractable model, when N200EX crashed.

Production of existing kits was little affected by the crash, and by the end of the year we were shipping up to fifty kits per month and we were maintaining good quality. However, our plans for the orderly construction of a new FT and the RG were totally disrupted by the crash. Suddenly we were faced with an absolute deadline to complete a new demonstrator for Sun 'N Fun. We were again faced with hiring skilled people and didn't have any better luck getting mechanics than other skills, so the guys we did have worked a lot of overtime. Unfortunately, as we got closer to our deadline we had to put the RG project on hold. As we made progress

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Express
Four place kit plane
Composite construction
200 miles per hour

on the FT, we got ahead of the manual and suddenly we were back to building with engineering guidance instead of simply following the manual, which also meant that the writers needed to be out on the floor documenting procedures that they weren't ready to write. This threw both engineering and the manual department off stride as they tried to balance construction of the airplane, the completion of the FT kits and manual and the remainder of the engineering for the RG as well as the production of the RG manual.

As time went on and Sun 'N Fun loomed closer, the new airplane necessarily gained priority and other projects slipped. I know that some of you have taken offense that I placed the completion of our demonstrator ahead of completing the manual and your kits, but we simply must have a demonstrator to sell airplanes, or we'll join Prescott and others who also didn't sell airplanes, although for other reasons.

The manual department spent a great deal of time during the construction of the new airplane documenting procedures which were beyond where they were in manual production. That was necessary, but unfortunately it put them behind on current procedures, although it will put them ahead in finishing the manual for the entire airplane. They are now pretty much back on track and although you haven't yet seen the results, you are about to. Nearly all of the procedures for the balance of Kit #3 are now shipping and I think these are our best manual pages yet. In addition, the documentation for the Continental fuel return lines, Continental and Lycoming engine selection, and other information is on its way.

We have not previously discussed our internal problems with you folks because for the most part they are the problems of growth, and in any event we know you guys don't want discussion, just parts. Prior to the crash, we felt we were well enough on the way that our best answer to shipping problems would be shipped parts. We feel that now we are nearly back to that position with most of our problems behind us. Certainly kits 1, 2, and 3 are going out on time without backorders and kit 4 is about to do likewise. The upper fuselage is our biggest part and most difficult layup (also biggest and most expensive mold), so we have built two of these molds in order to double our production rate. We are already shipping these kits now. The tail parts were intended to be in kit 4, but we're moving them to kit 5 to balance our production line, and the door and windows to kit 4. The windows, however, will not begin shipping until August, due to the extreme lead time from our supplier. The manual for kit four is progressing well. The draft documents are done, and many of the CAD drawings are completed, so the final version is due out shortly.

We have shipped a preliminary kit five to some of the "professional builders" and they are assisting in proofing the assembly and manual which should help to speed up release of that kit. We expect to be shipping Kit five in July or August. The RG manual is woefully behind schedule but we are hard at work to bring it up to speed as quickly as we can. We expect to resume shipping by July 15, and the first shipment will be substantial. We have hired an aeronautical engineer whose specialty (and seven years of experience) is retractable landing gear, and we promise to not let him do anything but finish the RG.

By the way, our production operation hasn't been idle through all this. We're still operating around the clock, and by the end of June we will have shipped nearly 600 kits. When this all

comes together, we'll see more EXPRESS' flying than any other homebuilt since Rutan's EZE series!

The options catalog. We have a huge amount of information and pricing and will get it all on paper and out to you folks as soon as we can after the previously mentioned items. Like other things it started strongly, but unfortunately got trampled in the Sun 'N Fun rush.

N210EX became airborne on the 21st of April after some five months of intense effort. The fact that we missed Sun 'N Fun caused considerable disappointment among our builders and prospective builders, but none so great as our own. A host of aggravations from our own mistakes, to late or faulty equipment from vendors, helped extend the project beyond our deadline by some six weeks. Continental had problems when their engine test stand cooling system failed, which overheated and damaged our engine so it had to be overhauled. They were over a month late shipping the engine, but when they finally did, they sent it by Federal Express!

There were numerous other minor glitches as you might expect, such as receiving the wrong governor from the manufacturer. Normally that wouldn't be serious, but in that it came direct from McCauley along with the new prop, we assumed it was the correct one. So we spent several days trouble-shooting a non-existent engine problem caused by the wrong governor. Easily fixed, again Fed-Ex, but it still used up over a week by the time we got the right governor installed. I won't bore you with all the details, but we should call this airplane the Federal EXPRESS!

Anyway its first flight was on April 21st in light rain and drizzle with a 2500 foot ceiling. Appropriate for the "Great Northwest". All went well, but the pressure was still on because AOPA PILOT Magazine was due to arrive on the 17 of May to do a pilot report and we were a long way from having a tested and presentable airplane.

By the 16th of May we had accumulated some 65 hours and gotten things in relative order. The upholstery wasn't quite done, we'd forgotten to apply our aerodynamic fix to reduce aileron stick force, and the graphics weren't on the side of the plane yet. We finished painting the graphics at 6:30 AM on the 17th of May, with AOPA due at 9:00 AM. Needless to say we were still pulling masking tape when they arrived. They spent two days with us flying and photographing the plane, and an article should be forthcoming in the August issue. The following two days were spent waiting out the weather so the next writer in line, Dave Gustafson, could shoot photos for Sport Aviation. We finally were able to get the plane up at 4:30 Monday, an hour and a half before Dave had to leave to catch his plane. We had him back on the ground 10 minutes late, but with photos, and Gary and Brian immediately departed with the plane for our California tour and we haven't seen the EXPRESS since, although by now many others have. I hope Dave caught his plane.

We didn't get all the testing and fine-tuning that we wanted before it left, but we did get the basics done and re-acquainted ourselves with the EXPRESS. So how does it compare to N200EX? It's basically the same airplane, just more comfortable. Loaded to about 2600 pounds, the best speed we've achieved is 211 mph true at 5000 feet and 2800 rpm, but as I mentioned, we haven't had time to fine tune it. Also, the initial climb rate is about 1400 feet per minute at that weight. Performance limitations we haven't had time to deal with are

unwanted drag from too much cooling air, no fairing over the fairly draggy nose gear suspension and a few other minor areas which, when cleaned up should make the production kits comfortably faster than 200EX.

The Continental engine is all we hoped and a little more. The little more is that it really sounds great on a high speed pass. Otherwise it's smooth, powerful, burns the same 10 gallons per hour, and looks great when we take off the cowl. The first production Continental engine is about to go on the test stand and they are due to ship to our customers starting mid to end of June.

According to some folks, the new EXPRESS is prettier than the old, primarily due to the nicer cowl shape and the fuller look of the enlarged fuselage. The snazzy graphics don't hurt, nor does the three bladed propeller. What three bladed propeller? Oh yeah, we had that prop on the shelf for the up-coming 300 horsepower version, and it was kind of burning a hole in our pocket, so to speak. Because it's a direct bolt-on replacement we switched props in the lull between AOPA and Dave Gustafson and were very pleasantly surprised. We gained about 50 mph on the ground, but lost some 7 or 8 mph top speed in the air, and about 150 fpm in climb. We were rewarded with an altogether quieter and smoother airplane though, and it looked sooo good we left it on. The feedback we gave McCauley from our testing encouraged them to make a three blade for our horsepower range so we won't be penalized in speed - we're looking forward to that. I've never before had the opportunity to directly compare the difference between 2 and 3 blades, so this was an eye-opener. I think there will be lots of EXPRESS' with 3 bladed propellers!

210EX is definitely a bigger airplane than 200EX, and heavier too. With a larger fuselage, larger tail the Continental engine and heavier components including wheels, tires, brakes, electric flaps etc, builders can expect an empty weight of 1550 pounds with the Lycoming engine, and 1610 with the continental. N210EX's equipped weight is 1840 pounds, which includes 75 pounds of avionics, 105 pounds known overweight items, and another 50 pounds of extras. We have the structural latitude to increase the gross weight to 2895 pounds, which we will publish along with the new useful load of 1345 pounds. N210EX doesn't have the aft CG problem as did 200EX, and during testing was loaded to its calculated aft CG limit, which it handled comfortably. It's quite comfortable flying with four people, which on this tour it has been doing regularly, in hot weather to boot.

As I mentioned, one area of complication was the avionics/electronics installation. This airplane is equipped with:

- 1) Dual Nav-Coms, 2) SDI Moving Map display, 3) Area Nav (DME, etc.), 4) Loran,
- 5) Horizontal Situation Ind, 6) Century 3000 autopilot, 7) Altitude encoder, 8)
- Remote ind. compass, 9) Fuel totalizer, 10) Engine Scanner, 11) Intercom, Bose
- headsets, 12) Electric trim, 13) Electric flaps, 14) Standard flight instruments, etc.

We had a tough time getting it all to cooperate and among other things, we learned a lot about antennas. We enlisted the help of several well known antenna/avionics experts, used a variety of antennas ranging from our own copper foil type to the regular external aircraft type mounted inside. Part of our problem was that the "experts" advice conflicted and we didn't have enough

time to thoroughly research the problem. As usual, the bottom line lies under time, sweat and perseverance. After the plane left we continued testing and can now offer some conclusive information which should satisfy those of you who have been wondering at the same conflicting information as we were. This isn't intended to be a complete report, but it's enough to judge the relative merits of the most attractive types for 'glass planes.

The types we tested included the Antenna Dynamics antenna, which is a copper foil type, of fixed pole length marketed to the homebuilt market for 'glass planes, coaxial antenna cable stripped to the proper length for the frequency, and the copper foil type we offer as an option.

There are two principal factors in the performance of antennas; power out, and power which is reflected back to the transmitter (reflected power) by the antenna due to poor design. Reflected power limits the signal strength transmitted, and can also interfere with other systems in the plane. Following are results we found with these com antennas at the low and middle frequency ranges which are most frequently used.

ANTENNA PERFORMANCE						
Antenna type	118MHz			126MHz		
	Power		% Refl.	Power		% Refl.
	Out	Refl.		Out	Refl.	
Antenna Dynamics	8	6	75	8	4	50
Stripped Coax	7	3	43	9	2	22
Copper foil	10	<1	<10	10	<1	<10

As you can see, simple stripped coax outperformed the Antenna Dynamics antennas. We had tried Antenna Dynamics antennas in the first prototype and found our copper foil antennas superior at that time.

We had folks with oscilloscopes, watt meters and other such equipment trying to gain an understanding of what the heck was going on with the rest of the installation. Frank Williams, (all 'round smart guy and designer of the SDI moving map display) and his technicians spent a week or so helping to get *our* stuff operational so they could interface their moving map. We finally got it all working at the same time in the same plane (except, ironically, for the moving map, which requires a special cable that SDI still hasn't received, but Frank's not upset). As we go along we'll share other things we learned with this complex installation in a fiberglass airplane.

Rumors. In my experience, as a company becomes more successful the rumors multiply, both internally and externally. A sure fire way to get rumors started is to hurt the sales of a competitor. Another is an occasion like the crash, which, when it disrupts normal operations, legitimately concerns believers and gives less scrupulous competitors an opportunity to use the misfortune to create rumors to fuel further damage. Many of our builders at Sun 'N Fun helped dispel rumors, for which we are grateful. I was astounded at the viciousness of the rumors there, as well as the fact that some of them attacked me and my family personally. By now most of the rumors have proven themselves false, at least one "reliable source" has been discredited, and time will deal with the rest. I won't dignify any of the rumors by addressing them individually.

I must admit though, that aside from the nastiness of the Sun 'N Fun rumors, others in the normal course of business have been entertaining if not fascinating. Like the one where the airport manager rushed into my office demanding to know why I had sold the business without informing him. From a "reliable source" he had heard that I had sold the business, was moving to Seattle and getting into real estate. Unfortunately, he hadn't heard how much I'd sold the business for, so I don't know if I got a good deal or not. Anyway, I don't care for the real estate business, so I'm glad it wasn't true. I can't guess the origin of this one, but just relating it will probably start a new one.

Thanks for sending in photos of yourselves, as Sandy and Janis in Customer Service have requested, and those who haven't complied, don't be bashful. On the other hand be honest. I have noticed that some photos are sort of suspicious. I have met many of you and I don't remember that many tanned, muscular he-men. This is not to say that the girls don't appreciate pin-ups, but they're beginning to inquire about coming to Oshkosh to meet these guys in person. In spite (or because) of your photos, the occasional flowers, and many pleasant hours on the phone, the girls wanted me to tell you how much they appreciate all of you. They (as the rest of us) feel a special relationship with you folks, which is a rare treat in today's world of business.

We are veeery pleased with our new airplane as are those who have had the opportunity to fly it. We apologize for not getting your parts to you faster so you can be likewise pleased with your EXPRESS. Please bear in mind that we want you to complete your projects as much as you do, and are working diligently toward that end. Moreover, we are doing our utmost to insure that the manual and the parts we send are correct. I hope you appreciate the scope of this project and the requirement that we can't shoot from the hip in any area, from engineering to crate building. We strive to deliver the best in the business, even if it sometimes takes longer. Thank you all for your patience and understanding over the past months. We are now getting out the procedures which have been delayed, and as we approach the final sections of the kit, anticipate far fewer problems with delivery. We expect that many of you will be flying by the end of the year.

Sincerely,
Wheeler Technology Inc.



Ken Wheeler
President