

# Pulsar News

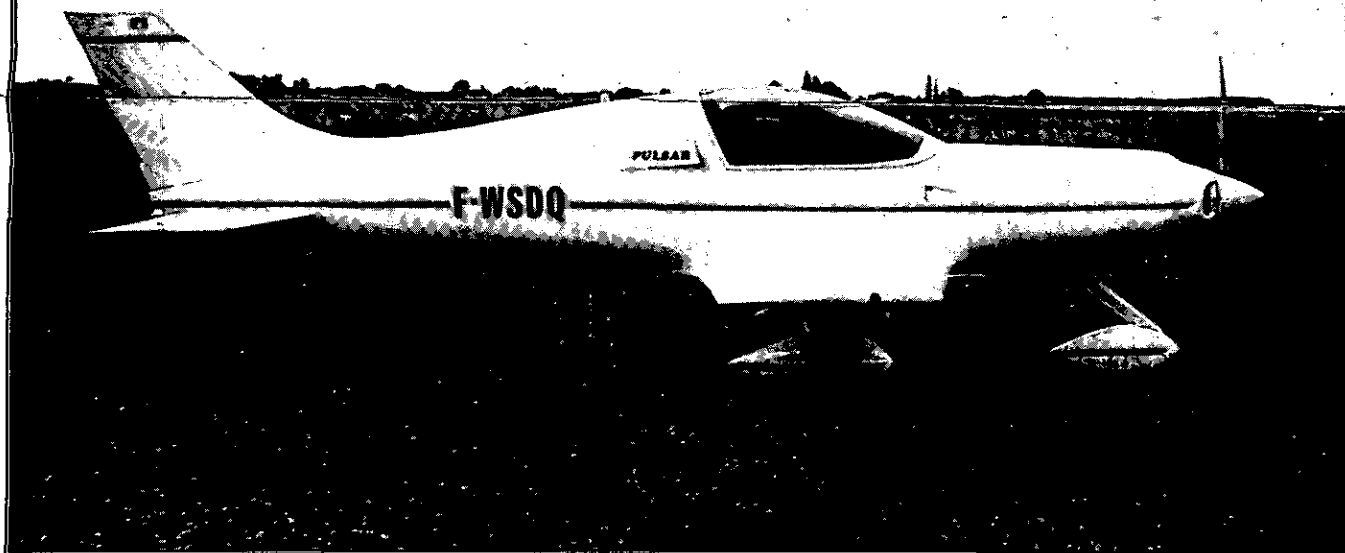
News, Updates, and Developments for Pulsar Builders and Owners

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## PULSAR OF THE MONTH F-WSDQ MIKE GREENE FRANCE



The Pulsar of the Month is an excellent Rotax 582 powered Pulsar finished and currently flying in France. The builder and pilot is Mike Greene. Mike's kit is serial number 288, the 188th Pulsar delivered. The kit left the Aero Designs shop in San Antonio, Texas on January 13, 1993. Mike made the first flight on May 2, 1995.

Mike incorporated several modifications into his Pulsar. Those modifications are: 1) copilot brake pedals, 2) a parking brake, 3) a modified flap selector handle, 4) dual throttles, 5) wing fuel tanks, 6) aux fuselage fuel tank holding 22 liters (5.8 gal), 7) modified fuel selector, 8) fiberfax firewall, 9) oil injection system, 10) electric pitch trim system, 11) electric aileron trim, 12) nav, strobe and landing lights, 13) cabin heater and finally, 14) adjustable headrests and backrests in the seats. With all of these modifications, Mike spent a total of 1800 hours completing his Pulsar.

Mike is a professional pilot. His comments and impressions about the first flight are very interesting. Here is what Mike has to say about flying his Pulsar:

"The week before my first flight was spent on final preparations, adjustments and ground tests. After several high speed taxi runs down our 3300 foot grass runway, I tried some short "hops" leveling off just above the runway. All flight controls felt normal, although I noticed the elevator felt very powerful with light forces in pitch. Everything felt really good, so this was it. No excuses for waiting any longer.

Back to the runway, final checks complete, I lined up and added power. I noticed 6100 RPM on the tachometer. At 50 knots, I eased the nosewheel off, accelerated to 65 knots and climbed straight ahead. At 500 feet I turned left onto downwind while climbing to

CONTINUE PAGE 2

the 700 foot AGL traffic pattern altitude. This whole time the airplane felt just fantastic - everything in the green and looking good. On downwind, I leveled off, brought the power back and maintained 90 knots in level flight.

My first approach was a descent to 100 feet above the runway to get a feel of the airplane at 65 knots with the flaps up during a low approach only. Everything felt just right. On the next pattern, I kept the flaps up, set up a 65 knot approach speed and landed. 65 knots is too fast in the Pulsar, especially solo. This caused my landing distance to be longer than necessary. However, I was on the ground safely and the grin on my face said it all - I HAD DONE IT!!!

During the next three days, I was able to fly five additional hours in my Pulsar. With the exception of minor adjustments and corrections, everything was perfect.

I have now flown off the first 60 hours required by the French authorities and have received the definitive "permit to fly". All of my test flights went as planned with only minor problems, almost all of which were with the modified systems that I installed. Here is a list of the problems discovered and solved during my first 60 hours aloft:

1. Ball out of center in level cruise. Solved by attaching and adjusting a small fixed trim tab on the lower rudder trailing edge.

2. Poor braking performance. Partially due to my modified braking system incorporating pilot and copilot mechanical brakes. However, I found it difficult to find the right compromise between the anti-shimmy torque required on the nosewheel pivot nut and acceptable braking/steering forces with a proper nosewheel return to tracking straight ahead when the brakes are released. After numerous adjustments, I seem to have it just about right now.

3. Unusual vibration. A very hard to find noise/vibration occurred during the initial flights. After removing and eliminating all possible sources, I found that the sides of my upper cowling seemed to resonate at certain

speed/power settings. This problem was solved by installing two small locating pins positioned between the two cowling halves on both the left and right sides.

4. Loss of braking on one side of the airplane. This has been my only embarrassing problem. While taxiing out for takeoff one day, I lost all braking on one side. I immediately shut the engine down as I ran off the side of the taxiway and into the grass. After inspection, I found that the brake lining had become unbonded from the brake band. Luckily no damage was incurred to the airplane during its excursion into the grass. I rebonded the lining to the band with resin and placed a shallow headed rivet at each end of the lining. This solved the problem and should prevent it in the future. By the way, the Pulsar makes a poor lawn mower!

Overall performance seems to be better than book figures. I am getting about 115 knots (132 MPH) TAS at 5800 RPM in standard conditions. Takeoff, climb and landing performance are all excellent.

In summary, building the Pulsar involved a lot of hours in my garage - but it has been worth it. My Pulsar has turned out to be a superb airplane that turns heads everywhere I go. It is also just a delight to fly.

I would love to hear from other Pulsar builders either in Europe or in the States. I can be reached at Mike Greene, 28 Rue de Villancy, 78640 Neauphle le Chateau, France."

## FIRST FLIGHTS

Since the last newsletter, there have been several Pulsars added to the finished and flying roster. Here are the newest Pulsars we are aware of that have been completed:

1. George Hanson - Pearblossom, CA. George recently completed a beautiful Rotax 912 powered Pulsar XP. It has a nosewheel landing gear configuration. George sent us a photo of the airplane setting in the paint shop after its final coat. It looks wonderful. First flight should have taken place by the time you read this.

2. Robin Hughes - Essex, England. Robin has completed and flown an excellent example of the Rotax 912 powered Pulsar XP, configured with a nosegear with large tires and fairings.

3. Joe Pridal - Southampton, England. Joe recently flew his 582 powered Pulsar. The airplane is configured for the rough grass runways of the UK with a tailwheel.

4. John Anderson - Bunbury, Western Australia. John recently completed and flew his Rotax 582 powered Pulsar. John has installed a nosegear on his airplane for the smooth grass runway he normally operates from.

5. Arne Kvaale - Oslo, Norway. Arne has a beautiful example of a nosegear Rotax 582 powered Pulsar in the air. This is the first Pulsar to fly in Norway.

6. Roger Watts and Steve Bateman - Buchinghamshire, England. These building partners recently flew their Rotax 582 Pulsar from a grass runway for the first time. Again, their airplane is configured with a tailwheel for the typical grass runways found in the UK.

7. Ken Rogers - Christchurch, New Zealand. Ken completed his Rotax 582 powered airplane recently and is ready for first flight. He has the tailwheel installed with the large tire & fairing option for some "bush flying".

## PULSAR AWARDS

During the past few months, several Pulsars have won some awards and have received special recognition. Those award winning Pulsars are:

1. Dale Schonmeyer and Howard Macfarlane - Both Dale and Howard participated in the Race to Sun'N Fun air race conducted this year in conjunction with the airshow in Lakeland, Florida. This race was for the fastest time from Troy, Alabama to near Lakeland, Florida, a distance of 380 miles. Several aircraft categories based on horsepower were established.

Dale and Howard's Rotax 582 powered Pulsars were both entered in the Sandpiper category, which was limited to 75 horsepower or less.

Race results for the Pulsars were excellent. Howard placed second in the category and Dale placed third. Howard's average speed for the non-stop 380 mile flight was 113 knots. Dale averaged 99 knots, even including a stop of 25 minutes for fuel during the race!

Congratulations Dale and Howard!

2. Greg Smith - Greg recently made a trip to attend the annual Fly-In and Airshow at Siloam Springs, Arkansas. Over 100 aircraft were in attendance. Greg's beautiful Rotax 582 powered Pulsar, N163GD, won the top award for the Best Homebuilt to attend the show! Greg was surprised, happy and proud, all at the same time.

Attaboy Greg!

## BUILDERS' FORUM ON AMERICA ON LINE

For everyone who has access to a home computer, there is now a Pulsar Builders' Forum on America on Line (AOL). Unlike the Internet, this forum is simply an area where you can post messages and information, ask questions or provide updates for others to read and respond. Nothing fancy - no pictures or databases to "point and click" on. However, it is perfect for builders to share helpful hints with each other and compare notes on different aspects of the Pulsar.

Here is how to get to the Pulsar message board:

1. Go to the AOL Main Menu
2. Click on "Clubs and Interests"
3. Click on "Aviation Forum"
4. Click on "Message Board"
5. Click on "Homebuilts and Experimentals"
6. Click on "Pulsar Builders"

America on Line costs \$10/month and includes 5 hours of free time each month. You call through an 800 number, so there is no charge. AOL is worldwide. You might find AOL an easy and inexpensive way to share information about building and flying the Pulsar.

## **FOR SALE**

Several customers have called with the following Pulsar kits or items for sale. If you are interested, do not hesitate to give them a call.

1. Glenn Pearce - VA. For Sale: SMART TACH - a digital electronic tachometer. Has built in hour meter and green, yellow and red range warning lights. New in box, with instructions included. Over \$300 invested, will sell for \$150. Call at (804) 220-4763.

2. Gary Polizzotto - GA. For Sale: Rotax 582 powered Pulsar. You have seen this one - cover photo and article in Kitplanes magazine 9/92 and 1/94. Rotax 582 has dual CDI, GSC adjustable prop, vibration dampener and stainless steel firewall. 295 hrs TTAE. Winglets, dorsal fin, rear windows, removable belly pod, 2 instrument panels, custom reversable interior, arm rests and heater. Deltron pearl paint and much more. NDH. Price: \$27'500. Call Gary Polizzotto at (404) 634-7811.

3. Lee Taylor - TX. Lee has purchased an early Pulsar XP kit from Gene Joy. The kit is serial number 257. It has the latest composite wing spar, but with wooden skins. The kit has been worked on for only a few hours, so the majority of the construction remains to be finished. Some of the mechanical components of the kit are missing, but can be replaced. This sounds like a kit that could be bought for a good price and then updated to the latest configuration. Lee is asking \$10,000 for the kit as is. He can be reached in Texas at (210) 257-4772.

## **MARKETING AND SALES NEWS** **1995 - A RECORD YEAR FOR** **AERO DESIGNS!**

1995 is now history, but what a year for Aero Designs! We delivered more kits in 1995 than in any other year in the company's history - a total of 64 complete Pulsar kits and 10 partial kits were shipped to customers all over the world. We have now shipped a total of 372 Pulsar kits to locations throughout the world.

To all of you who helped our company see a record sales year in 1995 -THANK YOU! Your spirit and enthusiasm rubs off - most of the people who bought a Pulsar kit in 1995 had at least one conversation with you, our existing customers. We really do appreciate each and every one of you who took the time to share your Pulsar building experiences with prospective customers.

REMEMBER, OUR COMPANY IS NOTHING WITHOUT YOU!

## ***FIRST ANNUAL PULSAR FLY-IN AND BUILDERS' CONFERENCE***

Everyone has asked about having a Pulsar fly-in and builder's conference for all existing and potential customers. Good news! We have decided to do it!

Mark your calendars for September 6, 7, and 8, 1996. These are the dates for the First Pulsar Fly-in and Builders' Conference.

We have decided to hold the first conference at Lawrence, Kansas. Lawrence is centrally located in the US for everyone who wishes to fly their Pulsars to the meeting. Lawrence has an excellent municipal airport (LWC) with long, paved runways and no tower. Lawrence also offers convenience for everyone who will arrive by airlines. Kansas City International should be the destination for everyone arriving by airlines. KCI is only 30 miles from Lawrence with excellent, low cost ground transportation available. The Holiday Inn in Lawrence will probably be our Conference headquarters.

Friday, September 6 should be a travel day with an informal dinner/meeting scheduled for Friday night beginning around 6 PM. Saturday will be a full day of activities both at the Lawrence airport and at the Holiday Inn's conference center. Sunday morning will be a short breakfast get together with departures scheduled for mid morning.

Details of the conference will be forthcoming in a direct letter mailed to all builders and potential builders. After receiving the letter, reservations can then be made through the Aero Designs shop. So, look at your schedule. We hope you will plan to attend our first Pulsar Builders' Conference of September 6, 7, and 8, 1996.

## OSHKOSH 1996 - AUGUST 1 - AUGUST 7

Now is the time to begin making plans for Oshkosh. This year's show runs from Thursday, August 1 thru Wednesday, August 7.

We will certainly be there, but this year in a new location. Look for us in the New Aircraft Display area between the new exhibit hangars A and B. This area is just inside the new main admission gate. Our display space is number 848.

All companies displaying aircraft will be relocating to this new area in 1997. We felt like it would be a good idea to go ahead and make the move one year early. Hopefully, this will give us first choice for a prime location in the years to come.

We hope several of you will decide to fly your Pulsars into Whittman Field for this year's event. It is always nice to see several completed airplanes on the flight line.

### OPERATIONAL TIPS INCREASED FLAP SPEEDS

We have received many requests for increased flap operating speeds on the Pulsar. Many of you flying the Pulsar felt that the original 65 MPH IAS flap operating speed was too low - that the Pulsar is sometimes too difficult to slow down to 65 MPH IAS prior to lowering full flaps. We agree.

After careful analysis, we are able to make the following approval: Beginning immediately for all models of the Pulsar, the flap operating speed and full flap extended speed is increased from 65 MPH IAS to 80 MPH IAS. This means that you can now extend full flaps at 80 MPH IAS and can also operate the airplane at speeds up to 80 MPH IAS with the flaps fully down.

With these higher full flap operating speeds, here is our recommended traffic pattern landing procedure:

1. Enter the pattern (downwind) with the airplane slowed to 80 MPH IAS. In the Pulsar, this speed in level flight requires very little power.

2. On downwind leg at 80 MPH IAS or less, lower full flaps opposite the touchdown point on the runway.

3. Fly the remainder of the downwind and base legs at 80 MPH IAS. This speed will help you fit in with the other traffic.

4. However, on short final, slow to 65 - 70 MPH IAS. Add 5 MPH IAS to this speed if you like, especially for gusty or turbulent conditions. **BUT DON'T APPROACH TOO FAST!** 80 MPH IAS for an approach speed over the numbers is too fast in all but the most turbulent/gusty conditions.

5. Touchdown is nose high, probably around 55 MPH IAS.

6. During landing rollout, try to hold the nosegear off the runway as long as possible. This nose high attitude adds aerodynamic drag which will shorten the ground roll without abusing the brakes.

We are hopeful that the new higher flap operating speed of 80 MPH will give you more flexibility in the traffic pattern. Give it a try on your next flight.

### CROSSWIND LANDINGS

While we are on the subject of landings, now is a good time to comment on the crosswind landing characteristics of the Pulsar.

During flight testing, Aero Designs has demonstrated that the Pulsar can be successfully landed with a direct 90 degree maximum crosswind component of 15 MPH (13 KTS). This doesn't mean that the Pulsar cannot be landed in stronger crosswinds. We hear stories all the time of successful landings made in much stronger crosswinds. It only means that a direct 90 degree crosswind of 15 MPH is the maximum we were able to find during the flight testing of the Pulsar.

We have found the best technique to use during a crosswind landing is a wings level crab into the wind for initial segment of the final approach. On short final (over the approach end of the runway), a transition should be made to a forward slip (upwind wing down, opposite rudder used to keep the nose tracking runway centerline). This technique seems to work best in the Pulsar.

Because of the tapered wing design, relatively high wing loading and powerful rudder, the Pulsar makes a very good crosswind airplane. The most notorious place for wind in the USA seems to be in Kansas. Greg Smith, a Pulsar pilot based in Kansas, gave us the following report of a recent crosswind landing:

'Coming home yesterday, I had a 60 degree crosswind at 20 knots, something I would not normally fly in. I performed a longer than normal final using the above procedure. Three notches of flaps, over the numbers at 70 MPH IAS for the turbulence, touch down at about 50 MPH IAS. Greased it! That's a confidence builder.'

### LANDING GEAR INSPECTIONS

Recently, one of our customers experienced a locked nose wheel on landing rollout that blew out the nosegear tire. The wheel locked because one of the cotter keys holding the axle came out of the fork on one side.

Don't forget to occasionally remove the wheel pants and visually inspect the landing gear/wheel assemblies. This is especially important for the nosegear. Once a month, a good visual inspection of the nosegear with the wheel pant removed could prevent a potential problem.

While you're at it, this is also a good time check the friction in the nosegear castor fork/swivel mechanism. Proper friction in the nosegear swivel mechanism is important to reduce the possibility of nosegear shimmy.

Here is the correct procedure for checking the nosegear castor fork/swivel tension:

1. With the nosegear off the ground AND THE WHEEL PANT INSTALLED, push back and forth on the aft end of the wheel pant.
2. It should take approximately 10 pounds of force with the optional large nosegear tire (5 pounds with the standard smaller tire) to swivel the nosewheel/wheel pant/castor fork assembly left and right.
3. If an adjustment is required, remove the wheel pant, remove the cotter pin from the castellated nut under the castor fork and tighten approximately one flat.

Reinstall the fairing and check the force again required to swivel the castor fork. Repeat the procedure as necessary. When the swivel force is correct, reinstall/replace the cotter pin in the castellated nut under the castor fork and reinstall the wheel pant.

### PROPER PREFLIGHT PROCEDURE - ROTAX 582 GEARBOX

An important periodic check for all of you flying Rotax 582 powered Pulsars is the condition and oil level of the gearbox. One of our customers in Germany recently found out just how important these gearbox checks can be.

Our customer in Germany recently reported a failure in the gearbox of his Rotax 582 that caused a forced landing. Fortunately, he was not injured and his Pulsar sustained only minor damage.

Upon inspection, the cause of the gearbox failure was clear. The oil lubricating the gearbox had slowly leaked into the engine crankcase and burned out through the exhaust. With very little lubricating oil remaining in the gearbox, it finally seized and stalled the engine.

In order to prevent this incident from occurring on other 582 powered Pulsars, it is important to periodically check the level of oil in the gearbox. In the case of the Pulsar in Germany, there was only 1 inch of oil left in the bottom of the gearbox. That is not enough oil for proper lubrication. The oil level should never be allowed to drop below the level of the fill plug in the side of the gearbox. If it does, find the source of the problem and correct it immediately before further flight. There could be an internal oil leak in the gearbox without any visible trace of leaking oil.

Another important check is the amount of freeplay or "backlash" in the gearbox of the Rotax 582. Before each flight, grasp the propeller at the tip and slowly move it back and forth. Feel for the amount of freeplay or backlash in the gearbox. From stop to stop, this freeplay should not be more than 3/4 inch. If it is more than 3/4 inch, the gearbox needs to be overhauled or replaced.

So, periodically check that gearbox on your Rotax 582! Proper lubrication and no excessive freeplay are

important for proper operation of the gearbox and engine.

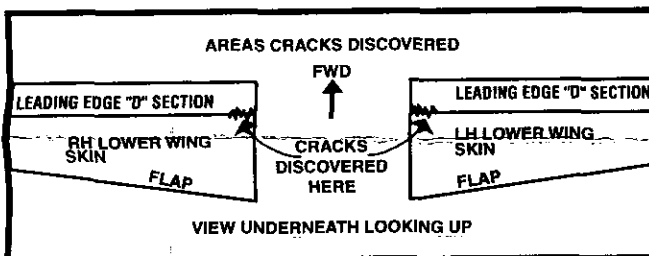
## ROTAX 582 - REPLACEMENT OF CYLINDER BLEED LINE

During the next scheduled maintenance period for your Rotax 582, a good idea is to replace the plastic cylinder bleed air line with a piece of 3/16" fuel line. This is the line that connects from the cylinder head to the coolant filler neck. Over time, this plastic line can become brittle and crack, resulting in a loss of coolant. The 3/16" fuel line replacement and clamps can be obtained from any auto parts store.

## REINFORCEMENT OF LOWER WING SKIN SEAMS

Recently, we were informed by one of our Pulsar 582 customers of a problem he encountered during the structural high "G" flight testing of his airplane.

After pulling at least 4 "G" on a proof load test flight, he noticed cracks developing in both left and right lower wing skin seam lines. The cracks were forming on the bottom surfaces of both wings in the bonded joint where the wrap around leading edge skin and the aft lower skin butt together over the inboard section of the main spar (see illustration below for orientation).



The bond of the aft skin to the main spar was found to be cracking and pulling away slightly from the spar beginning at the number one inboard rib.

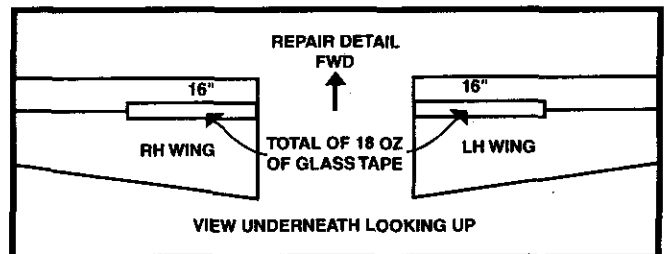
First, it must be noted that this is not a critical safety of flight issue. The aft wing skin will not pull completely away from the spar. The crack, over time, might grow to the next rib location, but it will stop there. Only over a long period of time and after many high "G" exposures could the crack in the bond grow any further.

For those of you who have finished, painted and are currently flying your Pulsars, begin including this area of the seam lines of the lower skins at the inboard sections of both wings as part of your normal preflight check. If any small cracks begin to develop in these areas, they will be immediately evident and visible. If you find cracks and they appear to be growing over time, they should be repaired during the next annual maintenance period as detailed in the procedure below.

For those of you who have not yet painted your wings or are still in the construction phase, the conservative approach is to go ahead and add some reinforcement to this bonded seam joint. Here is the proper procedure for accomplishing this:

## RECOMMENDED REPAIR PROCEDURE FOR LOWER WING SKIN SEAM JOINTS

1. On both left and right lower wing surfaces, locate the seam joint of the inboard leading edge skin (the "D" section) and the aft skin panel where they butt together and are bonded over the main spar (see illustration below).



The area of this joint to be reinforced is from the absolute inboard edge of the seam out to a distance of 16 inches as shown above.

2. The idea is to add a total of 18 ounces of 2 inch glass tape over the 16" length of the seam. This can be accomplished by applying two 9 ounce layers of 2 inch glass tape or six 3 ounce layers of 2 inch glass tape over the seam. Using six 3 ounce layers will probably be easier since three layers can be "feathered" on the edges and can be smoothed in better with the wing skin surface.

3. For aircraft that are already painted, it is important that all paint and filler be removed from the area over the seam to be reinforced. The area over and around the seam should be sanded and cleaned down to the original fiberglass or plywood surface. This will insure

proper adhesion of the reinforcing glass tape to the wing skin surface.

4. After curing, the glass tape reinforcement over the seam joint can be filled, sanded and repainted.

If you have any questions regarding this modification or need some materials to do the job, call John Hutson at (210) 308-9332. He can help you with anything you might need.

**All correspondence should be sent to:**

**Aero Designs Inc.  
11910 Radium St.  
San Antonio, TX 78216**

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**THAT IS ALL FOR NOW.**

**KEEP BUILDING AND  
KEEP FLYING!**

**SEE YOU AT OSHKOSH  
AUGUST 1 - AUGUST 7**