



Trey Johnson's RV-7 on Clamar composite amphibious floats skims across Lake Winnebago during EAA AirVenture Oshkosh 2007.



# OUT OF THE ORDiNARY

An RV-7 on floats

JIM BUSHA | *Photos by Bonnie Kratz and Phil High*

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Y THE TIME the confused orange-vested flag personnel on the ground figured out where to park it—Homebuilts? Amphibs? AeroShell Square?—Daniel “Trey” Johnson III, EAA 808574, had a large crowd circling his unique yellow RV-7. The crowds and their questions were steady throughout the week at EAA AirVenture Oshkosh 2007. Many were awestruck at seeing an RV-7 on

floats. Others were intrigued by what Trey had to say about the aircraft’s exceptional performance and the water-flying practicality of the popular homebuilt.

When you see the RV-7 for the first time up close, whether on land or in the water, you begin to appreciate the quality workmanship, problem-solving, and attention to detail that went into this project. Most of the people who gathered around it couldn’t help but gaze at the RV-7 and run their hands across the smooth surface of the wings, fuselage, and floats. The dynamic-looking aircraft was as much a delight to the eyes as was hearing its builder describe his flying past and how he came to build the amphibian. >



## AS THE ONE-OF-A-KIND RV ENTERED OSHKOSH AIRSPACE,

Trey was mesmerized and dumbfounded by all the different airplanes that were queuing up to land. He was also impressed by how well organized the controllers were, even if they couldn't figure out what to call him. Fortunately, the AirVenture judging committee didn't have the same problems as they awarded him a Gold Lindy in the Seaplane category.





Photos courtesy of Trey Johnson



**Trey logged nearly 2,000 hours of construction time, including second and third attempts on several parts, before completing the RV-7 airframe on wheels. It's powered by 210-hp Lycoming IO-390 engine. Trey wanted lots of backup in his instrument panel, so he elected to put in a full IFR panel. Powering up the panel for the first time was another of those special moments.**

**I**t would be much easier for me to tell you what Trey hasn't done in his 42 years of life than to explain his accomplishments, ratings, and aerial adventures. Trey has spent more than his fair share broadening his horizons and immersing himself in all facets of aviation. When it comes to flying, for Trey and many others like him, there is nothing more magical than breaking the bonds of earth in an aerial machine that not only flies like an eagle but also lands like a duck.

Trey grew up in Louisiana and spent most of his childhood in New Orleans, so it's easy to see why he had a keen desire to learn how to fly off water. "It wasn't until I was 21 years old that I became serious about wanting to learn how to fly," said Trey. "I chose to go to Embry-Riddle Aeronautical University in Arizona because I already knew more than my fair share about thunderstorms, having grown up sailing on the Gulf of Mexico. But I wanted to learn more about mountain flying. My intent was to earn a degree in business and acquire all my pilot ratings at the same time.

"I guess you could say I got sidetracked by some of the friends I made at school who kept telling me about how wonderful the flying was in the Northwest. After earning a handful of fixed-wing ratings, I moved to Portland, Oregon, and started working on my commercial helicopter rating. And oh, by the way, sometime in there, I got my float rating and I was really getting into sky diving. I had already made around 500 jumps during my free time."

As Trey's sky diving adventures became more frequent, he had no choice but to put his helicopter instructor rating on hold when a unique opportunity presented itself. With interest in sky diving increasing in the Portland area, Trey bought a twin Beech to haul sky divers aloft. The classic aircraft was as unique as its owner, because instead of having the standard Wasp Jr. R-985 radial engine on each wing, this aerial hot rod sported PT6-20 turbines. This was also the first taildragger Trey had ever flown.

Undaunted by the powerful Beech, he received a thorough checkout and became a sky diving nomad. He and his airplane traveled around the country, wintering in Florida and returning to Oregon in summer. As if he didn't have enough on his plate, Trey also began competitive sky diving. In 1992 and 1993, he and his fellow sky divers won the U.S. Nationals and added three silver medals in world competition. After that, he retired from sky diving and found a new love in aviation—float flying.

"In 1995, after moving back to the great Northwest, I worked for various companies in the Seattle area that flew fisherman to lodges in Canada," said Trey. "Most of my time was in Beavers, and all of it was VFR with a waiver to operate 200 feet above the water. The flying part was exciting, but the awesome view that lay before me was breathtaking. Humpback and killer whales would surface and play in the shadow of the slow-moving Beaver as bald eagles circling above watched me with great contempt. Even though the eagle's wingspan is smaller than that of a Beaver, they aren't afraid of the airplane. I'd always smile and bow to them out of respect because I know that this is their territory they are allowing me to pass through."

For the moment, it seemed as if Trey had settled in for a long career of float flying. Although he will admit he was happy at the controls of the Beaver, he will also tell you his eyes and imagination wandered toward sport aircraft flying. Trey was more than a little



Trey Johnson

**BELOW:** With the help of friends, Trey attaches the left wing to the RV-7 fuselage prior to initial certification of the aircraft on wheels.

**RIGHT:** Trey applies UHMW tape to cover the gap between the wing and flaps to improve performance.



Photos courtesy of Trey Johnson

**ABOVE:** Trey first certificated his RV-7 as a landplane and flew off the initial flight test hours with the airplane on wheels. Once that flight-test period was completed, he took off the wheels, hung the RV-7 fuselage from rafters, and began the task of installing the floats.

**RIGHT:** After many measurements, CG checks, the addition of some weight to the back of the floats, and another FAA inspection, the RV-7 was ready to take to the water.



interested in flying something faster than the 110-mph, heavy-hauling Beavers as he set his sights on the Lancairs, RVs, Glasairs, and anything else that looked fast. He also wanted to learn more about how airplanes were built and wanted to incorporate both performance and his love of float flying. Enter the amphibian RV-7.

“It really hit me hard when I was flying my 450-hp Cessna 195 in formation with a buddy who was in his RV-4,” said Trey. “Here I was burning 25 gallons an hour, and he was sipping fuel. To make matters worse, I had to keep asking him to throttle back because I couldn’t keep up with him! I knew right then that not only was I going to build an RV but also I knew I wanted to make it an amphibian. There is that added feeling of security when I’m tooling around up here knowing that I can land just about anywhere. I also wanted to be able to land on out-of-the-way lakes for fun, while enjoying the sunset and watching the colors change in slow motion as the rest of the world goes screaming by at Mach 10. Trouble was I had no building experience and only average mechanical ability. When I told

some of my friends that I wanted to put an RV on floats they thought I was crazy. That didn’t stop me though, because I found someone who had already thumbed his nose at the naysayers and proven the concept by putting floats on an RV-6.”

**T**he RV amphibian trailblazer Trey referred to is Canadian bush pilot Eustace Bowhay. Eustace, it is said, has flown just about everything in Canada with wings, wheels, or floats. From a Grumman Goose to a North American P-51 Mustang to a Douglas DC-3 to a Van’s RV-6, the 20,000-hour pilot flew ‘em all. When Trey contacted Eustace about his RV-7 amphibian scheme, Eustace was in his 80s. He had just suffered a stroke, but was full of encouragement and advice. Trey soon realized that the idea was not only feasible, but Eustace handed him the torch to carry on the spirit of homebuilding. In February 2006, Trey made the call to Van’s Aircraft and ordered an RV-7 quick-build kit.

After talking to as many RV builders as he could, Trey intentionally made some high priority building decisions. He did not set a goal of finishing the RV by a certain date. He knew from his own experience that the path you think you choose in life has a way of disappearing before your eyes. Trey also knew that he was not going to attempt to build the RV at home because he feared there would be too many distractions that would only fuel the onslaught of frustration. Realizing his limitations, he chose to work under the guidance of Synergy Air of Eugene, Oregon.

“I had attended the basic one-day metal workshop class and was impressed with the whole process. I then enrolled in the tail kit class, and although I didn’t know beans about building, I was eager to learn. I went at it full-time with the guidance and help from countless people. At times, I’d sit and read the plans and then read them again trying to interpret the meaning. There was a lot of trial and error because it seemed that I made three of everything—one good and two bad! Looking back, I came close to crying at times and wanted to give up more than once. But I’m glad I made all those mistakes because it not only teaches you to do it right no matter how many whacks it takes, but it also makes you strive for what’s best.”

As pieces of bent metal were attached to the skeletal frame of the RV, Trey began creating a list of essential items to bolt to his airplane. These included a 210-hp Lycoming IO-390 engine, state-of-the-art avionics panel, custom interior, a classy paint job, and of course, the all-important amphibious floats. Trey admits





Bonnie Kratz

he was a little naive about the floats, not that he didn't know the difference between metal and composite pontoons; it's just that he figured it would be no problem finding a pair for the RV. He thought wrong. Searching high and low and chasing dead end leads, Trey finally caught a break when he was told to call Clamar floats of London, Ontario.

"I got a tip from an old crop duster friend to call Clamar," said Trey. "I had never heard of them before, so I looked them up on the Internet and saw their product in color. I obtained a list of owners who were using them and gave them a call. After interviewing these people, I was sold on the product, and now I just had to convince Clamar to build me a set of composite 2200 amphibians for the RV. I spoke with them, and they were supportive, even going out to take measurements from a fellow RV-7 builder who lived close to their factory. In September of 2006, I drove to Toronto, threw the floats on a kayak trailer, and drove them back home where I couldn't wait to attach them to the RV. Well that was the original plan, but again that was changed when I spoke to some friends in the industry who convinced me to certify the RV on wheels first and then recertify it on floats. The Clamars sat unused until June of 2007."

**W**ith the floats safely tucked away, Trey concentrated on the panel and interior. He knew he wanted a bunch of extra safety features built into his avionics suite, so he installed a full instrument flight rules panel. Trey was excited about some of the new hardware and was like a kid in a candy store as he loaded up on gadgets. The heart and soul of the panel is a Garmin 430 GPS/nav/comm. He also went with a Mode S transponder, MVP-50 engine monitor, backup altimeter, airspeed indicator, GPS, course deviation indicator, and autopilot. He installed a tried and true analog trim indicator that has made

balancing the RV and those big floats underneath very easy in obtaining neutral trim. Trey initially was going to install a five-point Hooker Harness system for ultimate personal safety, but a small mistake on his part made him change to a different setup.

"I inadvertently put some wiring in the way, so I had to go with a four-point system instead," said Trey.

With everything plugged in and ready to play, it was time for Trey to decide on the RV's paint scheme. He knew from experience that a high-visibility paint job was necessary, especially flying around those "little hills" in the Northwest. With safety as a driving force, he selected a high-gloss, bright yellow scheme with black accents, large black glare shield, and checkerboards on the rudder—just to spice things up a little. With the paint barely dry and the RV-7 sitting pretty on its wheels, Trey was now ready to begin accumulating some well-earned RV stick time. Although he had flown a variety of complex aircraft in the past, he didn't want to put as much as a micro scratch on his new pride and joy.

"I knew I needed to get some quality RV training," said Trey. "Hard to believe, but flying the RV was an unknown thing for me. I teamed up with one of the top-notch people in the business, Mike Seger in Scappoose, Oregon. Mike was such a great asset as a teacher and mentor, and I really learned a lot from him about how to handle an RV properly. We did, however, banter back and forth on one issue—Mike is a full-stall three-point-landing guy and I am a wheel-landing guy—each of us thought our way was better. We ended up agreeing to disagree, but I have to tell you that Mike definitely wears the RV like a pair of well-worn jeans.

"I found the RV to be very well-behaved on the ground, compared to the manhandling of a single Otter or Beaver.



Bonnie Kratz

The RV is so well designed and so well balanced that during my first flight I had to quickly realize that this little airplane is very sensitive on the controls. It is nothing compared to the big lumbering floatplanes I fly for a living. That experience was something I looked forward to getting used to.”

**I**n the spring of 2007, Trey made the leap of faith in his newly certificated RV-7 as he took to the skies for the first test flight. He thought he knew what to expect, drawing from his most recent training, but was instead blown away by that initial flight. Trey said that flying his RV exceeded his expectations as he charged ahead, flying off the necessary hours during the break-in phase. With all hours accounted for, it was time to pull the wheels, dust off the floats, and re-certificate it as an RV-7 amphibian.

“We hung the RV from the ceiling and got it stabilized and perfectly level,” said Trey. “We set the floats under the suspended RV in exactly the right position. We measured and started to cut; unfortunately, we were a little off. It turned out to be a huge geometry puzzle, and I will be honest with you, the struts you see on the airplane are not the first ones. It turned into a game of trial and error as we made some initial mistakes. But once we figured out the problem, everything came together rather quickly.

“The RV has a very small elevator, so we cheated a little by mounting the airplane a little more aft relative to the floats, figuring in our ability to rotate safely. When you make that change, you start messing up the CG in flight; if it’s too far forward there’s too much float mass in front of it, so more than likely you would end up flying with aft trim. To counter that effect, we added just enough weight on the stinger that protrudes from the back to balance everything out. Oddly enough, it is just about the same weight as the tail wheel. I have not seen any noticeable trim issues to speak of and am very pleased with the outcome.”


In June 2007, with everything hung and stowed in its proper place, it was time once again for Trey to don his test pilot hat and take the RV out of dry dock for its maiden voyage. Although he had plenty of amphibious experience,

he admits he was more than just a little nervous as he prepared for the first water flight.

“It was more of a feeling of uncertainty,” said Trey. “I knew I had built the kit properly, and had so many sets of eyes inspect every nut and bolt even before the FAA inspection. I also knew I was properly trained and current, but I couldn’t help but wonder what was going to happen when I flew it on floats. In fact, I almost quit before even getting airborne on the first takeoff. I settled down, pushed the throttle in, and was all smiles as the RV cut through the waves like an old pro—it felt like all the other amphibians I had flown. The one thing I did notice, though, was that because the elevator is smaller than I am used to, I didn’t get a lot of good elevator authority until I was just above stall speed. To counter that effect I plan on adding a vortex generator system in the future.”

With everything on the RV in shipshape condition, Trey flew off the mandatory hours with no squawks reported. Wasting no time, he and a friend set sail for Trey’s first visit to EAA AirVenture Oshkosh. With the addition of the floats, Trey’s max gross weight rose from 1,800 pounds to 2,300 pounds. There was more than enough useful load for the 42 gallons of fuel and two passengers.

**A**s the one-of-a-kind RV entered Oshkosh airspace, Trey was mesmerized and dumbfounded by all the different airplanes that were queuing up to land. He was also impressed by how well organized the controllers were, even if they couldn’t figure out what to call him. Fortunately, the AirVenture judging committee didn’t have the same problems as they awarded him a Gold Lindy in the Seaplane category.

“EAA Oshkosh is such an amazing place,” said Trey. “I finally got to meet the countless people I had spoken to on the phone while I was building the RV. Everyone I met was so helpful and patient to a newbie like me. There is nothing like traveling the general aviation way and the people involved. I have not done a long cross-country for a couple of years, and I thought it was going to be different or drastically changed for the worse. I was wrong; it was just as I had remembered—awesome! Flying to Oshkosh, making new friends, and seeing all those who have helped along the way was such a wonderful experience. The RV and I will never forget this place—Oshkosh on the water!” 

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*Jim Busha is a police detective and has served in law enforcement for 23 years. He is also an avid pilot and owns a 1943 Aeronca L-3. He recently co-authored his first book, The High Battleground, with photographer John Dibbs.*

## GO DIRECT



To view a video of Trey’s RV-7 in action visit [www.EAA.org/video](http://www.EAA.org/video).