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THE WORLD'S SMALLEST JET AIRCRAFT
THE SMART-1 OWNED BY NALLS AVIATION

COVER STORY

NALLS AVIATION: PROUD OWNERS OF THE WORLD'S SMALLEST JET AIRCRAFT

By Art Nalls

There's a new baby in the Nalls Aviation family. At 13 feet long and about 5 feet, 8 inches high, it fits neatly under the wing of the Sea Harrier and the L-39 already in the hangars. It looks more like a model airplane than the real thing, but real it is.

Nalls Aviation is the proud owner of the "World's Smallest Jet Aircraft," a BD-5J, Microjet, s/n BDA-01, officially recognized by Guinness World Records. Weighing in at a whopping 358 pounds, this particular jet holds the record for the class. However, this jet will remain on the ground for the foreseeable future. Jim Bede himself advised Nalls not to fly that jet, until a new engine could be fitted. "It will definitely quit on you," advised Jim before his death a few years ago. "And there's no way to restart it in flight. Get rid of it!"

Fast rewind back to the 1970's...

Jim Bede, with many superstars of aviation design on his team, including Bobby Bishop and Burt Rutan, was busy turning out kit airplanes from his company headquarters in Kansas. His first designs were mildly popular, but when



Looking like a model airplane, Nalls Aviation is proud to own the BD-5J Microjet, "the world's smallest jet aircraft."

(Courtesy Art Nalls/Nalls Aviation)

news of his BD-5 debuted at the Oshkosh airshow, he knew he had a hit on his hands. Designed as a single-seat, personal aircraft, with a pusher propeller, it was sleek, small and cool! Orders started pil-

ing in, with Bede accepting deposits toward the total kit prices.

But there were issues. Parts suppliers couldn't keep up with demand. Kits were shipped missing key parts. And to top it off,

his main engine supplier, Hirth Engines, went out of business. Hirth had been in business since before WWII, supplying engines for snowmobiles. The engines were simple, inexpensive, reliable and plentiful; absolutely perfect for a home-built airplane. Bede was left with major flaws in his design and business plan. No engines and not enough spare parts.

Advertised as buildable with simple, around-the-home tools, by an average person in a reasonable number of hours, didn't set well with builders who were quickly over their head, with a living room full of boxes and plans. Incomplete boxes, at that.

Then the lawsuits started. Unable to keep up and with most of the deposits spent on legal issues, the company folded, leaving hundreds of builders to fend for themselves...find new engines, make a few parts. The early accident rates reflected the power of innovation by the inexperienced.

But a few of the builders persisted. Burt Rutan married a small jet engine, intended for unmanned vehicles, to the aft fuselage. Bobby Bishop built one of the jets, did the flight test and knew he

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World's Smallest Jet

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had something for the airshow business. That airplane is still flying today.

Bishop managed to secure a key sponsorship with the Coors Brewing Company and was an immediate hit on the airshow circuit. Flying a pair of the tiny jets, they performed all over the U.S. and in front of millions of fans, billed as the "Coors Light Silver Bullets." The jets were proving themselves as legitimate airshow draws, along side Bob Hoover and other airshow icons. Only a small dot in the sky, the jets are just as impressive on the ground. They look like toys. People had a tough time accepting them as real jets, not radio controlled toys, just barely large enough to fit an adult. They are go-karts with wings, capable of astounding speeds – up to 300 mph!

Then the U.S. government took notice. Bishop and his company, Aerial Productions International (API) were drafted for service. The tiny jets closely resembled a known threat – cruise missiles in several ways. Notably, their small size and speed were keys. But another key factor, Radar Cross Section (RCS) was what the government officials were looking to duplicate. Larger airplanes appear on radar as airplanes. But cruise missiles, which can be launched from almost any platform and are available on the black market, are themselves small and much harder to detect. The BD jets fit the bill perfectly, and thus began a new business model. The airshow business went by the wayside, and the microjets were now national assets.

Business was great for several years. So much so that the government actually tested the micro jets by placing them on a special stand and accurately measuring their radar returns from all angles. Some modifications (proprietary to API) were made to the airframes to make them more closely simulate the cruise missiles, upgraded avionics to provide data to the flight test engineers real time and post flight, the fuselage was lengthened five inches to accommodate carriage of small, government-furnished equipment, and they are now quite different from the airshow models, with the weight increasing to more than 570 pounds, with extra fuel substituted for smoke oil. The Defense Intelligence Agency officially certified the API microjets as Type-1 Cruise Missile Surrogates in 2000. That designation still stands today.

Bishop's company grew to four flying jets. Their list of past customers reads like a veritable who's who of government contracting, including all the services, major government agencies, and contractors alike.



Bob Bishop at the controls at St. Mary's County, MD during a demonstration flight in the D.C. Area. (Lloyd Gill)



Pete McNall at the controls with Chris Rodgers as ground crew. (Courtesy Nalls Aviation)

But then, business almost died in 2012. The phone stopped ringing and proposals went unanswered. API downsized, then downsized again and again. What went wrong? Sequestration put this type of testing on the chopping block.

Fast forward to 2017....

API needs a new direction. Bishop noted from posts on social media that Art Nalls has a BD and intends to fly it. Although they had never met, Nalls has some interest in BD's and with his background in bringing the world's only civilian Harrier jump jet to life, maybe he would like to join with API?

Bishop and Nalls connected and there was a common interest immediately. With Nalls' contacts in the flight test field at NAS Patuxent River, Maryland, maybe this could be the solution. Nalls, and his wife Patricia, are also located in Washington, D.C. where government business gets done. API is headquartered in Tucson, AZ, 2,500 miles away.

Art and Patricia visited API and saw the airplane, spares, and met the team, or what was left of it. They decided this could be for them. They had already done the near-impossible restoring and flying the World's Only Civilian Harrier. This would be easy, by comparison.

Nalls and Bishop inked a deal to allow Bishop to ease out of flying and day-to-day operations and ease into a well-deserved retirement with his bride, Linda. Nalls, not too far from retirement himself, was looking for a new challenge. He also agreed with Bishop on many things, and felt strongly that this impor-

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World's Smallest Jet

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tant capability should not be allowed to simply evaporate. The jets are providing extremely valuable flight-testing and need to be preserved, flown, and employed.

So, as soon as Nalls recovered from a badly needed total knee replacement, and cleared by his flight surgeon to return to flying, he traveled to Tucson to revamp the business.

"I've always loved the BD-5's but never got a chance to fly one. The cockpit is extremely small, but it's a real airplane," said Nalls. "Since I'm physically at the upper end of pilot size, we are extremely careful about the airplane's weight and balance. Pilot fit is critically important."

In fact, one of the key factors is not just weight (230 lbs is about the limit without aft ballast), but shoe size. Ten and a half is the absolute limit. One hopeful, retired Marine Colonel was sadly disappointed that he couldn't fit in the cockpit because his feet were too big. Most of the current pilots wear NASCAR racing shoes because they are light and small. They even try to squeeze into a size or two smaller, so they fit better on the rudder pedals. "After all, we're not going to run a marathon in them," said Nalls.

Nalls now has a Letter of Authorization to fly the microjets. A team of pilots, instructors, maintenance crew, some from the East coast Harrier operation, all convened at Tucson for a concentrated training class. When the Designated Pilot Examiner arrived, he noted the professionalism and precision that the whole team exhibited. The examiner now wants to fly the jets himself, and has volunteered to be on the list.

Plans are to expand the team with



Chris Rodger (L) and Eric Martin (R) assist Bob Bishop during the strap-in and pre start procedures for the demo at St. Mary's.
(Lloyd Gill)

pilots and ground crew, and separate the assets into a West Coast Team and an East Coast Team. They will be outfitted with identical support trailers and simulators so all the parts are as interchangeable as possible. They also have a substantial stockpile of spares and parts, including 15 of the original BD-5 kits. More airplanes are not only possible but likely.

"We have submitted quotes to multiple agencies, looking for business," noted Nalls. "The biggest response we've received is 'we didn't know you guys were still in business.'" So lots of potential business could be just around the corner, hopefully in the new fiscal year.

Nalls intends to let everyone know, they are indeed back in business and ready to work.

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