

John Quinn of EXOS Aerospace Systems & Technologies, Inc.

Hall T Martin: [00:00:04] This is the Investor Connect Podcast Program, I'm Hall T Martin. I'm the host of the show in which we interview angel investors, venture capital, family offices, private equity, and many other investors for early-stage and growth companies. I hope you enjoy this episode.

Hall T Martin: [00:00:23] Well hello, this is Hall Martin with Investor Connect. Today I'm here with John Quinn, Co-founder and Chief Operating Officer at EXOS Aerospace Systems and Technologies. EXOS is a small Defense Department Trade Commission (DDTC) registered privately-owned space hardware and operations company. The EXOS team has developed hundreds of rocket engines, over a dozen reusable flying vehicles, and has even developed manned propulsion systems used on Rocket Racers. Post-COVID-19, EXOS pivoted to hypersonic reusable launch vehicle development at the U.S. Air Force and MDA supported and funded Phase I SBIR project. John, thank you for joining us.

John Quinn: [00:01:00] Great to be here today.

Hall T Martin: [00:01:02] Great. So, what was your background before joining EXOS? What did you do before this?

John Quinn: [00:01:06] Oh, wow. Yeah, I'll slide way back. Started in Navy silent service on submarines and that's the old catchphrase there - I can tell you about it, but....because we did some pretty cool things back then and I served on both Fast Attack and Trident submarines. Stayed in the military in the reserves, went into power plants, and in 2007 started my first entrepreneurial venture. While I was still working, I founded a business. 2011 rolls around and I look back at what happened to me in 2000 & 2008 in the markets. And I saw in 2000 I had planned to retire at 55, by 2008 I was up to like 75/85 with an average life expectancy of 84, so I didn't think it was too good, and that pushed me to look at how often do the markets really correct and things like that. So, in 2011 I had to do something about it because I had lost 75% of everything in my retirement following a broker, and I met this gentleman named David Mitchell, he's a pastor, a 4th-generation oil man, an entrepreneur himself, and he was teaching people

how to trade stocks, not how to follow a set checklist or something, that has, "These are my stocks", but actually teaches how to do it. So, followed that, just dumped myself into it alongside with working as an engineer for 70, 80 hours a week, and fired my boss in 2013. Started developing some Navy submarine technologies that I had kind of prototyped when I was on a submarine, and now the electronics would actually fit in the devices I had built. So, I found a group of guys, they were actually rocket scientists who could help me with the programming and some of the machining and the devices, and that company allowed me to meet the rocket scientists that now make up EXOS Aerospace. So, that's kind of where we got here.

Hall T Martin: [00:03:15] And so, what led you to start work in the space industry? What attracted you to it?

John Quinn: [00:03:20] Yeah, so as I started working with these guys at Armadillo Aerospace, it was led by John Carmack - many of you will know his name from video games, from Call of Duty, you know, he wrote all the first-person shooter stuff and all the background graphics that make those so amazing - and he was part of Oculus at that point, and they were bought out by Facebook for a couple of billion dollars, and here I see these brilliant rocket scientists who helped me develop my submarine technologies that now can't or don't have their leader anymore as far as building rockets, so, I was like, "How can we keep these guys going?" Because at that point, they were one of just - and even now - one of three companies in the world that have flown reusable rockets. And I said, "You guys can't stop". And they said, "Well, we're running this machine shop and we're going to pay for our development through that". And, I brought my mentor, the guy who taught me how to trade stocks, and ultimately, he was the guy who taught me how I could fire my boss, right? I approached him and said, "Hey, you got to come up and meet these guys up at this airport up here in Cattle Mills". And I brought David up and in the background I had been working on a business plan for about three months because I thought I saw some really great opportunity. So David came up and he fell in love with space watching Friendship7 on his first-grade teacher's black and white TV right across from the school. They walked across the street, and he loves telling the story, how he went across, sat on the floor of his teacher's house and watched Friendship7 take off, and he was a space lover ever since. So, taking him to an airport where there's hundreds of rocket engines, multiple different flying vehicles from lunar landers, to rocket planes, just even to the carnage of

what had blown up while they were building these several hundred rocket engines, and he just fell in love with it and he calls me back a couple days later and he says, "Hey, we ought to help these guys get back to space". So, I emailed him the business plan. I said, "Well, here's a little something I've been working on for about the last three or four months. Take a look at this". And EXOS Aerospace was born.

Hall T Martin: [00:05:50] Well, great. So, you've been working in the space industry for a number of years, what's your advice for people investing in the space? What do you tell them to do before they write that first check?

John Quinn: [00:05:59] Oh, wow, that's a great question. Don't buy, what we like to call "vaporware" or "paperware". There's over 100 companies competing to build the next small LEO Launcher, Low Earth Orbit launcher, and there's never been, and I don't believe there will ever be abundance in launch capacity, so, invest in operational history. Look at companies that have built actual hardware, actually have experience with not only manufacturing but operating space vehicles, because as good as those business plans could be of any one of those 100 companies, when it comes down to understanding how to go from a failure to success, there's something to be said for the experience. And while you can hire that experience - I mean, we've got SpaceX, Blue Origin, between those two, they have over 10,000 employees and they've been trained - the company vision for something different is what's going to make a huge difference in this space. And, the second most critical aspect is being able to execute on that vision.

Hall T Martin: [00:07:18] Great. So, let's talk about investing in the space sector. How do you see the industry evolving?

John Quinn: [00:07:23] Yeah, so that's another great question that's been asked many, many times. It's making a move today to go from what used to be primarily commercial - or a DOD-led launch - to commercial launch. Last year over 70% of all the flights that were conducted were done under an FAA launch license and those are all commercial launches. So, I think we're going to see that there's a shift from DOD, unlimited or essentially unlimited budget, to commercial. We have to compete, we have to make space affordable in order to make space available.

Hall T Martin: [00:08:07] Well, great. Well, how fast is this sector growing compared to others?

John Quinn: [00:08:11] Yeah, well, the space sector can be broken up into many different segments. The great thing is all of them are growing anywhere in that 5-12% annual growth rate and that's been going on now for several years and looks to be accelerating even more with the moon to Mars mission that we're going for by 2024.

Hall T Martin: [00:08:33] Well, so how many companies are engaged in it?

John Quinn: [00:08:35] Yeah, as I said, there's about 100-125 LEO hopefuls. When you start talking about who's involved, obviously SpaceX and Blue Origin are out there to take people to space and they're taking capacities the size of school buses, right? Well, all these small companies, these 100-125, are looking to put small individual satellites up, but they're not going to just throw them up in space and then let them work for the next 3-6 months to get to where they need to be. These companies are actually going to go up and say, "OK, we can launch in short order, we can put it in the exact orbit that you want or a close inclination so that you can get there". And I think you're going to have three, five, ten of these small LEO launch companies that make it, serving a small niche market where they can service that customer who wants a dedicated launch, wants to do it six months from now, not three years from now, and is looking to be able to update their technology after several years at an affordable price point.

Hall T Martin: [00:09:50] So, what are the challenges in running a space-related business?

John Quinn: [00:09:54] Wow. Yeah. So, thousands of moving parts, hundreds of subsections, and again, there are thousands of competent engineers out there. Where we're going to make a difference, I believe, is in true reusability, and honestly, EXOS is about reusability. We have a rocket-powered plane that we put people in with an engine that we fired 1,000 times with zero maintenance in between starts. You know, you think a rocket engine, it starts, it gets you to space and it's done, you don't turn it on again until SpaceX and Blue Origin. Now they do their reentry burns and they come back and they may fire that engine two or three times during a flight, right? So, that's different for the industry. We started out by doing 1,000 relights. So, the reusability we're talking

about is our rocket, we flew four times, and our turnaround cost between flights is down in the 1% range. That's reusability, that's aircraft-like reuse, and that's what we're targeting. The Space Shuttle was a phenomenal vehicle, 27 flights at \$1.28 billion per flight. We did turn it once in as little as 60 days. SpaceX, fast forward 20 years, Blue Origin 15 years later, reused a vehicle. SpaceX just refurbished a vehicle in 52 days, just in July of 2020 here, but it cost 25% of the original vehicle cost, so still \$16.5 million, probably over 1,000 people refurbishing that vehicle, getting it ready in that two-month turnaround. And we're talking about rinse and repeat reusability, where we check a few fittings, make sure they're tight, refuel the vehicle, put the new payload section in and turn around and get this vehicle back in the air. That's the reusability that we're going for.

Hall T Martin: [00:12:01] So, why is reusability the key factor in this?

John Quinn: [00:12:04] I think I'll defer to Peter Beck of Rocket Lab. His vision was that, "Oh, we can manufacture rockets in a matter of days and we'll just build a bigger factory", until you realize that commercial space is coming and you can't build a factory big enough to actually compete in the market and drive costs down. How long have we been driving cars? Nobody drives to work and throws the keys in the dumpster on their way out because they're not going to drive it again, right? Yet, our space program has been built on that premise for way too many years and the only way we start making space available is by bringing the cost down. And we believe there's really two ways to do that: true reuse and segregation of mission. SpaceX and Blue Origin, my hat's off, they've done phenomenal things. And Blue Origin, I would actually applaud a little bit higher with Jeff Bezos on the reusability, I think he's actually gotten further along than SpaceX, but we still haven't gotten to that point where we've said, we're going to have cargo vehicles and we're going to have manned vehicles. So, Blue Origin and SpaceX, they're going to carry people to space, right? So they have oxygen systems, and they have all the life support stuff, and they have redundancy. But I anticipate that 95% of everything that goes up to space is not going to be human, it's going to be hardware to support life on the moon and life on Mars. So with that, why would we build a \$1-billion vehicle when a \$100-million vehicle can carry payload? So, I think you're going to see a segregation in the sector, hopefully, EXOS is leading the way for that by having a true autonomous cargo craft where we can operate on much, much lower cost price points for dedicated launch of hardware.

Hall T Martin: [00:14:11] Well, great. Well, in the last few minutes that we have here, what else should we cover that we haven't?

John Quinn: [00:14:16] Oh, wow. I'd just like to encourage our education, science, technology, engineering, and math cohorts out there, because that's what the future is made of, getting them excited about space, and one of the most rewarding days at work for me is when I get a call from a junior high schooler or grade schooler, who says, "Mr. Quinn, how do I test my payload? We're ready to fly and go to space on your next flight, but you said in here that I'd have to test it for 5G's impact, that it can handle that without breaking. How do I do that?" And you'd say, "Well, go talk to your teacher and see if you have a second-story window at school that you can drop it out of and have her help you with the math to do that calculation". And, you know, it comes back in one of the students' handwriting where the teacher had helped them and they have calculated how many Gs of force you will experience for dropping a _____ out of a 12-foot high window at the school. And they say, "That'll reach 5.6 Gs by the time it hits. So, is that a good test?" And to see their eyes lighting up and just the creativity that they come up with on ways of doing some of this testing. That test costs nothing more than opening the window, and sometimes in our engineering world we would have a \$50,000 system to do that test, right? Just great stuff. Again, STEM education is going to be the future of our space force.

Hall T Martin: [00:16:07] I agree. I like the creative solution they came up with on that very low cost, too. So, it's great to see people thinking out of the box in this case or in this case out of the window. So, how best for listeners to get back in touch with you?

John Quinn: [00:16:20] So, we can be reached at support@exosaero.com, and there's even a place you can sign up to fly payloads to space and as we tout itself, we spend a whole lot more on the high school jerseys for our football team or basketball team, than we do on sending payloads to space. And on one of those budgets from our local school, I could send half a dozen payloads to space every year. So, the doors are opening and space is becoming available.

Hall T Martin: [00:16:53] Great. Want to thank you for joining us today and hope to have you back for a follow-up soon.

John Quinn: [00:16:57] Thanks very much Hall. You have a great day.

Hall T Martin: [00:17:01] Investor Connect helps investors interested in startup funding. In this podcast series, experienced investors share their experience and advice. You can learn more at Investorconnect.org.

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