



Game Changers Series: Episode 1 – In-Space Transportation

Speaker: Robert Carlisle, CEO and Co-Founder, Argo Space – 7 minutes

John Gilroy: Welcome to Constellations Game Changers, a limited series of short podcasts each focused on a pivotal new technology or trend for the satellite industry. Our guest today is Robert Carlisle, co-founder and CEO of Argo Space, and the topic we've chosen for Robert is in-space transportation.

Robert, I have three questions for you and my timer set for 10 minutes. Are you ready?

Robert Carlisle: I'm ready, John.

John Gilroy: Good. Robert, could you explain what you and the team at Argo mean by in-space transportation?

Robert Carlisle: Yes, certainly. So at Argo, we are building what we call in-space transportation vehicles. You can think of this like a truck for space, right, where the rocket that is launching from Earth is a cargo ship going to lower earth orbit, LEO, and we pick up the cargo there. So effectively splitting into separate modes of transportation the way terrestrial logistics works, right? This allows each mode of transportation, in our case, the rocket and the in-space transportation vehicle, to operate the most efficiently and the most effectively.

So we're trying to decouple the transportation in-space from the transportation to space and part of that is bringing reusability into orbit. So the reuse of first stages of launch vehicles, of rockets is quite common now, but in-space, this hasn't been done yet. So what we're doing is a bit different from the traditional kick stage or tug architecture where you have a vehicle integrated as an extra stage on the rocket with the customer payload on top we're talking about a true dedicated space resident transportation vehicle.

Traditionally, rockets have been the only real mode of transportation for space. They deliver satellites either to a transfer orbit or directly to that satellite's final orbit and then the satellites have their own propulsion and navigation systems for orbit rays. In our view, rockets and satellites are really both doing too much work today, which makes the whole system more complex, less efficient, and increases costs throughout the development build and deployment cycle. And our piece of the puzzle solving this is the in-space transport leg. This is hard to do. It requires regular, reliable, on-orbit capture of customer satellites. It requires refueling of our transport vehicles, of our trucks. But once we can

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achieve those things, we'll be able to provide a super efficient, flexible, and responsive transportation service that goes across all different orbits.

John Gilroy: So Robert, this series is called Game Changers. Tell us what impact your company will have on the industry.

Robert Carlisle: Yeah, so our view is when we have dedicated, reusable in-space transport systems like what Argo is building and others are looking at parts of this as well, industry can fundamentally improve how space systems are designed and deployed and how rockets are used. So several major impacts of this on the industry. For normal satellite deployment, pairing a heavy, low Earth orbit launch with a low cost, refuellable in-space transport system that can really make every orbit as accessible and as affordable as low Earth orbit as today, both for small satellites and for large satellites. For rockets, we can really maximize their capability, maximize their utilization. Rockets are most efficient when they just have to deliver a payload to LEO, to low Earth orbit. That's how you get maximum mass to orbit. That's how you get the lowest cost per kilogram, best reliability, and the highest launch rate. And we need in-space transportation, that separate leg of logistics to fully realize the potential of the low cost heavy lift that is just around the corner.

So if you look at how SpaceX is launching Starlink satellites today on Falcon 9, right? An unprecedented launch rate, firing them off several times a week, and maximizing the rocket's mass to orbit at a super low cost. Part of what enables that is launching a standardized payload stack to a standardized set of orbits. And that's a huge contrast from the traditional launch process that takes 18, 24, sometimes more months of contracting, mission design, analysis, and testing to deliver a customer's unique satellite to its unique orbit. Very different from what you see with these multiple times a week Starlink launches.

Step this forward to Starship and to other big launch vehicles. To get that rocket to a daily launch rate, and SpaceX talks about that, right, and to maximize its mass to orbit, it'd be great if we could just have a standardized, optimized LEO cargo route flying out of Cape Canaveral with a standardized payload stack. Then, you can have the in-space transport leg, the space trucks take the customer's payloads out to the orbits they want. So essentially, this in-space transportation, it can really be an enabling capability, maximizing the benefit, minimizing the cost of low cost heavy lift to LEO, and extending the benefits of high launch cadence and cheap mask orbit out to all of industry across all the orbits.

John Gilroy: In-space transportation. I think you've given our listeners a pretty good idea of what it is, but their question is now, in your opinion, what will be the impact over time?

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Robert Carlisle:

Yeah. So in the very near term, we're at Argo working to provide affordable, flexible access to MEO, GEO, and cislunar space to small satellites, including giving them control over their own schedule and their own orbit. Longer term, of course, we'll scale this up. Others are also working on in-space transportation and we think this reusable in-space transport architecture will really allow space logistics to operate like traditional terrestrial logistics. And that means the ability to move arbitrary mass between arbitrary points in-space whenever you want to.

People are asking right now what is the real use case for space mobility. I think that question is fundamentally rooted in a traditional view of what space architecture is, how space hardware works. But if we look a few years out into the future, it will become obvious that unconstrained, abundant movement in-space is critical for going to the next phase of space architecture. We'll see these cheap, reliable cargo ships to LEO, paired with flexible, affordable trucks for moving things across orbit. And I think within five to 10 years, we'll reach the point where this abundant transportation is normal.

On-orbit pickup of payloads will mean we can move things in orbit after they're deployed, regardless of whether they have their own capability to do this. And not everything in orbit will have to look like the complex satellites we have today, right? You can start deploying parts, raw materials, supplies, and really change the risk posture in-space, letting organizations try out new business models, get to lower cost and price points, move faster and start building bigger and moving more responsibly across every orbit.

John Gilroy:

Thank you, Robert, for being our guest in this short episode. Constellations is partnering with Nova Space to bring you exclusive content leading up to the World Space Business Week. Hear more from Robert at the event, and we hope you enjoyed this episode in the meantime.