Constellations Podcast

Episode 66 – New Accessibility to Space, Start-Ups and a Changing Value Chain

Guest: Alex Greenberg, Co-Founder and COO, Loft Orbital – 20 minutes

John Gilroy: Welcome to Constellations, the podcast from Kratos. My name is John Gilroy, and I'll be your moderator. Our guest today is Alex Greenberg, co-founder and COO, Loft Orbital. Today, we will discuss how the increased accessibility to space is changing the way business is done. Loft Orbital is a startup company that provides end-to-end solutions for organizations that want to launch satellites into space, but not necessarily operate them. We will discuss the increased accessibility to space, the complexity of space missions, the opportunities and challenges of startups in the space industry, the space value chain, and how policymakers can leverage this increased access to space.

John Gilroy: So Alex, it's all about space made simple, huh?

Alex Greenberg: That's true. Absolutely, John.

John Gilroy: Well, tell us a little bit about your company, maybe in a nutshell, here.

Alex Greenberg: Very quickly, Loft is an infrastructure provider for the space industry. And our mission is to make space simple for our customers. So we own and operate satellites that are typically mini fridge or washing machine size, and on those satellites, we fly kind of customer sensor completely as a service. You can think of us as a one-stop shop for deploying missions and operating them. And on a single satellite, we can either rideshare multiple sensors or fly a dedicated single customer payload. So our model is to actually buy standard satellites from a partner, and on top of those satellites, we fly sensors enabled by standard products that we built. So on one hand, there is an interface unit at enables us to very simply interface with a whole range of different payload types without actually forcing any modifications on the bus design. And then second, we have our own mission control system that is one code base to fly any kind of satellite bus and any kind of payload, so these are the products that we've built to fulfill our mission of making space simple.

John Gilroy: So what you're doing is you're increasing accessibility to space for a wide range of companies. So how is this changing the industry?

Alex Greenberg: Yeah, I mean, right now space has really been in the realm of large institutional users like space agencies or military or large, well-capitalized, publicly traded companies. And I think the last 10 years have really seen a revolution where lots of other players want to get into space. And I think the CubeSat has been the primary way that startups, other commercial players, even government has

tried to access space. What Loft realized though, is that the CubeSat is not really the ideal platform for the future of space because it's not as stable, powerful, robust or reliable of a platform as a larger satellite. So what Loft is doing with our rideshare model is giving these types of customers with smaller payloads the ability to fly on a larger, more reliable microsatellite platform. And we think that giving customers more performance, more reliability but without sacrificing speed or cost is going to really increase the type of capabilities and democratize the capability that these customers can get into space.

John Gilroy: So if a company like say, Apple or just pick another big company that wants to get in space, they have to worry about satellite procurement integration, launch, launch campaign, licensing, insurance. I mean this is kind of a big deal, to quote Ron Burgundy. It's a lot into it, isn't it?

Alex Greenberg: Right.

John Gilroy: And what you provide is an alternative to that.

Alex Greenberg: Exactly. So customers come to us with a sensor or a mission that they want to fly. In some cases we're actually maybe procuring the sensor from a third party. There are even some cases where we'll co-develop a sensor with a customer, but then we take that sensor and we shield the customer and hide them from all the challenges of buying a satellite bus, actually managing a launch campaign and procuring a launch, doing commissioning in satellite operations. And then of course, the regulatory side of spectrum licensing and remote sensing licensing, getting satellite and launch insurance. All those pieces we really standardize into one offering that we sell and resell to multiple customers, that we become kind of excellent at executing that process, while our customer really just has to focus on payload application and data, which is what matters most to them.

John Gilroy: So instead of software as a service, it's satellite as a service.

Alex Greenberg: There you go. That's how people tend to think of us.

John Gilroy: Well, I'm in the Washington, DC area. Just up the road from us is a place called NIST. All kinds of standards up there and real accurate clocks and everything else. What about standards? How will standardization affect the number of companies that want to explore space missions?

Alex Greenberg: So Loft isn't really necessarily developing a new standard. It's not like where developing USB 4.0 for space or a new kind of Ethernet or a new kind of space dial, which is a common interface in the space industry. Think of it more as a universal adapter or almost a Rosetta Stone that enables one kind of product or one kind of payload to interface back and forth with any kind of satellite bus.

Because really, what the challenge in space right now is the immense amount of design and modification and customization required at the beginning of the mission, which then drives increased costs and unpredictable schedules and just general challenges in accessing space.

Alex Greenberg: So we're trying to remove all of that non-recurring development and engineering effort from the space mission by using the same satellite bus over and over. So no matter what the payload configuration on board is, whether we're flying five payloads or one payload or two imagers and two RFs or one imager, or whatever the case may be, the underlying technology stack and satellite bus that we're using is largely the same. And that's really, I think, the revolution that we're trying to bring about this that doesn't currently exist in space.

Alex Greenberg: And the benefit of that to the customer, and what really matters is because we're using more standard products, we can deploy missions a lot faster. And what we found is a lot of customers are willing to even trade performance for speed and reliability in getting to orbit. So that is what we are optimizing for with our service offering, and we have found a lot of newer customers to take advantage of that.

John Gilroy: You know, in a competitive market, many times, the best product doesn't win, but maybe the best product out there is going to win. And this is what will give your leg up. This is what someone who is contacting Loft Orbit is going to say, "Hey I got to get this X, Y, Z out there and I want to get out there before John Gilroy does," and this is what you provide. You give them an opportunity, don't you?

Alex Greenberg: Absolutely. And if you're a space agency with $100 million very exquisite, unique science instruments, flying on our single digit million mission with Loft might not make sense. It might make sense to go the more traditional route and procure a custom built spacecraft from one of the usual players in the industry. That's not really the market we're serving. We're serving the emerging commercial market, the market for proliferated LEO solutions for constellations for quick access to space, and it's becoming more and more popular. So that's really what we're targeting in terms of the customer set.

John Gilroy: I've been moderating these Constellations podcasts for a couple of years. Just in the two years I've been talking to people like you, it's gotten so, so complex, the number of terms. There's a move now to ground stations and moving to the cloud. It's getting really complex. I mean, is that impacting the way you do business, this complexity?

Alex Greenberg: I would say our job is to actually handle that complexity for our customers. So if our customer is just able to focus on developing their sensor or developing their data analytics capability and trust that Loft Orbital is going to deliver them to space on spec and on time, then we've done our job.

Alex Greenberg: So in general, the tools available for us have actually made many things, I would say overall simpler, but there are a lot of new business models, new players that probably cloud the landscape and make things look a little confusing from an outsider's perspective.

John Gilroy: I was listening to a marketing podcast yesterday with a guy named Mark Schaefer and he says, "You know, your company's got to be the only one that," X, Y or Z. And that's what you folks are. You're the only ones that I know that do pay for performance service, aren't you?

Alex Greenberg: Yes, that's definitely true. That's a big selling point for us and also something that we really believe in. And the reason for that is right now capital expense to get an asset in space is actually the largest impediment to accessing space. I would say that really trumps any of the technical limitations or technical challenges that you face in a satellite mission, unless you're the US government or NASA or someone like that.

Alex Greenberg: The other thing is most people are fully paying for their mission before a single byte of data is downloaded. So you're fully paying for the satellite, fully paying for the launch, fully paying for the payload and all the other components and everything on the satellite. So your vendors, really, at the end of the day in space are not fully aligned with you. Because by the time the thing goes up, they've already gotten paid. So, of course there are contractual mechanisms that try to prevent that, but I would say we really want to make a big statement on the market by aligning our incentives to be more customer obsessed.

Alex Greenberg: And the way we do that is actually putting our money where our mouth is and not actually getting paid in full, where we can be profitable until we provide a service that is accessible to what the customer has requested from us. So in our model, we charge a portion of our total contract value with each customer, prelaunch. And then post-launch, we have what's called a service level agreement, which specifies levels of performance that we need to hit. And if we hit those, we get paid an agreed upon service fee every single quarter for the three to five years of the mission. And only if we do that, do we get paid. So our incentive is for the customer's mission to be successful.

John Gilroy: Oh, I like this. In other words, you buy a car and you're going to partner with me, "That car is going to last for 100,000 miles," and if it doesn't, you'd be right

there with me. This is really an incentive to do business with you, isn't it? A unique incentive, I'd say, too.

Alex Greenberg: Yeah. And certainly from a financing perspective and a risk perspective, we definitely make it a little harder on ourselves. We have some, I would say, contractual solutions for how we do that, and we've also been able to secure financing and infrastructure financing in order to get the assets in space without it all coming off our balance sheets. So there is a little bit of financial engineering to make this work, but we think that this business model is the future of space. And so for the last three years, we've been big proponents of it. Haven't really seen too much adoption, but you're starting to see vendors be more willing to push things into the post-launch period. So I think we're slowly bringing around some change, but it's something that we really believe in.

John Gilroy: I go to events all the time. I was in an event two weeks ago, whole bunch of people, all startups. Startup this, startup that. So let's go back in time and drop you in the middle of this room full of startup people. What advice would you give to startups that want to pursue your industry, the space industry?

Alex Greenberg: I'll give two pieces of advice, especially in space. So the first thing is go into the aerospace supply chain with your eyes wide open. And remember that aerospace is really the worst case scenario for manufacturing. It's both low volume and nonstandard. So right now, most satellite companies or satellite component companies are building very few copies of different things. So they don't get economies of scale, they don't get the benefits, the productivity gains of building the same thing over and over and there's a lot of design work involved. And when there's design work, there are unpredictable schedules, potential cost overruns, things not working, things getting in the way of your schedule.

Alex Greenberg: So just go in with eyes wide open, and also know what you're optimizing for. If you're optimizing for speed and schedule, then don't also have very aggressive performance terms. Or, be comfortable with things maybe not working as you expected them to. If performance is really what you're optimizing for, then expect things to take a year longer than you initially budgeted for. So things like that, that even though the aerospace supply chain has really made amazing gains over the last 10 years, there are still challenges that any space company will always face, especially getting started when, on your side, you might not have the resources to manage those vendors in the same way. So that's kind of advice number one.

Alex Greenberg: The other thing I'd say, and this is more on the business side, talk to 30 customers before you really get started, and especially before you raise any capital. And if you can't find 30 customers, that's probably saying something. A lot of people in the space industry dream up some value proposition, or some

service that adds value to their customer, that turns out isn't really a thing or that's already fragmented, or from a business model or from an economic person's perspective doesn't make any sense.

Alex Greenberg: So look, these things are very hard to predict. And on one hand, you kind of have to dive in. But I would take a couple months to really hear the voice of the customer and have actual conversations with them before you really get started, because it's a 10-year journey to build a space company. And if you don't actually have a real market, you're going to find out the hard way after wasting a lot of your own time.

John Gilroy: Yeah, the rule of 30 for validation, that makes a whole lot of sense. You know, Alex, thousands of people from all over the world have listened to this podcast. If you are listening and want to get alerts when new episodes are available, go to Google, type in Constellations podcast, click on Kratos and give us your email and we'll send you out emails when the next interview is available.

John Gilroy: You know, a trending word here, if you go to Google Trends, a trending word is geospatial driven insights. You know? What do you think increased access to geospatial driven insights will change the way companies make decisions?

Alex Greenberg: You know, we're not a data company. We're an infrastructure company that empowers data companies and users of space data. So I'm not an expert in how geospatial data is being used by commercial companies. I kind of think of this, though, in two ways. I think the proliferation of satellites, better access to space, better sensor technology, kind of all the things that we've been talking about, has two impacts on the downstream market.

Alex Greenberg: The first is that existing users have more access to space data to improve what they're already doing with space data. So the NRO, for example, just announced that they are doing a study contract to potentially buy commercial signals intelligence and commercial synthetic aperture radar from a couple of commercial companies. So I think that's really exciting. Those companies present new capabilities that can improve the type of intelligence analysis and gathering that an organization like the NRO is already doing.

Alex Greenberg: Secondly, all of this data and all of these insights can create new use cases for geospatial data that solves some problem that maybe we haven't even thought of yet. And I'll be honest with you, that's one that I'm a little more uncertain about. I don't know how the finance industry or how the insurance industry is really going to handle more data, especially if there're users there that have never used the data before.

Alex Greenberg: So I think open question, if new use cases or killer apps are going to emerge, but I do think that all the data that's being generated and all the analysis capabilities are certainly going to help the existing user base of satellite data, which is immense.

John Gilroy: You know, only in this podcast could you say NRO buying SAR and people would understand.

Alex Greenberg: Yeah. We love our acronyms.

John Gilroy: Boy, don't you?

Alex Greenberg: For sure.

John Gilroy: So every business has got challenges and opportunities. So with these changing efficiencies and the space value chain, what are some of the challenges that you see?

Alex Greenberg: That we see in our business?

John Gilroy: Yeah.

Alex Greenberg: Or, in the industry in general?

John Gilroy: In the space value chain, yeah. The industry in general.

Alex Greenberg: Like I said, it's transitioning from more of that low volume, differentiated products kind of production mindset where you're essentially an engineering company building solutions to specific customer requirements or customer problems. That's where things are right now. I really want to see the industry transition to more of a product company where yes, you might close the door on fulfilling all the requirements of every customer, but you have a standard product that people can walk into your store and buy and come away with in a couple of months, because it is still aerospace.

Alex Greenberg: So that's really what we want our partners to do for us. We're okay if performance in certain areas is limited as long as the product design is frozen and predictable and we can buy that thing over and over and over. So I think some of the mega constellation providers are necessarily bringing about that way of thinking. But in the world of exquisite, kind of one-off satellite development, that is still not the mindset and companies aren't really thinking that way. So finding partners that think as more of a products company, not an engineering company is very important for us, and that's kind of critical in our interactions with our partners.

John Gilroy: So Alex, you absolutely provide increased access to space, we know that. So what industries do you target? What industries do you think will benefit from this increased access?

Alex Greenberg: I would say it kind of comes across two main verticals in space.

Alex Greenberg: That's no surprise here.

Alex Greenberg: Commercial and government. On the government side, we're actually spending a lot of time with what we call emerging space nations. So these are countries that have fairly small space budgets, maybe low tens or hundreds of millions. So in space, that's quite small ... that have a desire, whether it's strategic or for education purposes or for national pride or for just national capacity building, they want to get assets in space. But for them to replicate building a mini NASA or a mini space industry in their country doesn't really make sense.

Alex Greenberg: What they want to focus on is the high value part, which is the payload and the data, the so-called ride to get there, which is what Loft provides, the satellite bus, all the nuts and bolts of deploying the satellite and the launch. It doesn't make sense for them to replicate that in-house or do that in-country. So we're partnering with a lot of countries that have this issue where they want to get assets in space, they don't really know how, they don't have the resources. So Loft is almost like a space industry in a box for them, or out of the box for them. That's been a big focus for us. Those are hard markets to access because connections and networks are very important there. It's often opaque to navigate the political and the budgetary landscape. But we've been heads down on a couple of customers over the last couple of years, and we're now seeing that bear fruit. I think that's one thing we settled on and, and really focused on from day one that a lot of space companies only realized much later.

Alex Greenberg: The second is the commercial side. And we're seeing a lot of interest from both big commercial companies that are actually moving into small sets and moving into LEO. So for example, we have a customer called Eutelsat, which is a almost very classical geo-telecom company that did TV broadcasting and that kind of thing. And for the first time, they're moving into the low earth orbit, or more of an “internet of things” kind of use case. And so we're flying a couple payloads for them on a number of our upcoming missions. So that's an example of new budget and new customer that was big in the space industry but wasn't addressable for small SATs or anything in LEO, and now is. And that's something that we've captured.

Alex Greenberg: And of course, there are tons of space startups looking to do in-orbit demos or deploy small constellations or deploy large constellations. And for those kinds of

companies, we want to be the infrastructure that flies and operates them for the long haul.

John Gilroy: Last question. Here's kind of a question from 40,000 feet, or maybe LEO orbit, something like that. Now, do you think policy makers can use this more cost effective way, your way, to access space in their socioeconomic decision-making? And this is a new frontier, isn't it?

Alex Greenberg: Yes. I think on the policy side, there is definitely a lot of work to be done to accommodate new business models like Loft. So maybe this isn't the direction you were going in with your question, but we see a lot of regulators not exactly know what to make of us. For example, we sort of obscure the classical ownership model of a spacecraft, where one company or one entity owns the satellite bus, owns the operations, owns the payload; it's up and down fully theirs. And we sort of blur that because our model is effectively leasing space on a satellite bus to a number of different customers. So ultimately, Loft is the sole operator of our satellites, and that's undeniable. However, policymakers have to wrap their minds around that and wrap their minds around that new model. So we're doing a lot of explaining and a lot of kind of really hunkering down with policymakers across some different agencies in order to explain this to them, because we think we can ultimately make their lives easier by aggregating and centralizing a lot of the inbound requests that they usually get.

Alex Greenberg: So long-term we want to be the same kind of recurring stakeholder to these policymakers, but it requires a lot of explaining upfront.

John Gilroy: Well, Alex, unfortunately here, we're running out of time. I'd like to thank our guest, Alex Greenberg, co-founder and COO, Loft Orbital. Thanks, Alex.

Alex Greenberg: Thank you.