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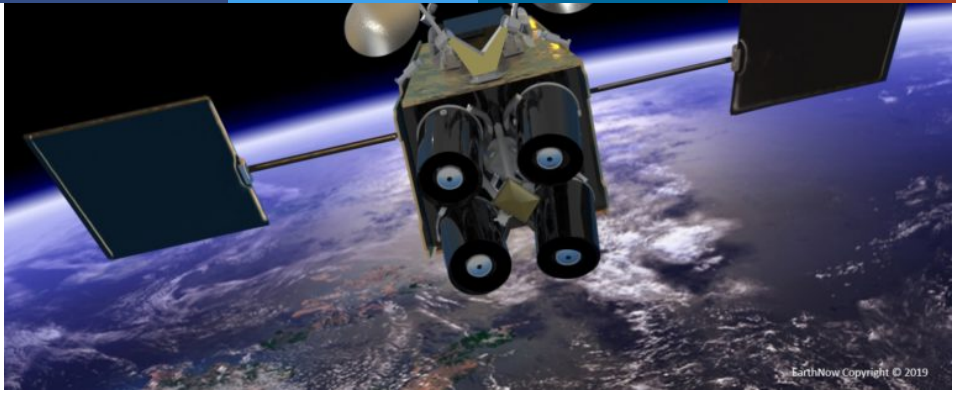
Space

EarthNow fleshes out plan to deliver video that shows Earth from orbit in real time

BY ALAN BOYLE on February 4, 2019 at 7:30 am



An artist's conception shows one of EarthNow's satellites in orbit, equipped with four telescopic cameras. (EarthNow Illustration)

BELLEVUE, Wash. — A satellite startup called EarthNow is laying out the details of its plan to blanket our planet with high-resolution, real-time, live-video coverage from a 500-satellite constellation in orbit, with support from Microsoft co-founder Bill Gates, Europe's Airbus, Japan's SoftBank Group and other high-profile backers.

The revelations come a year after Bellevue-based EarthNow raised $6.6 million in a seed investment round from those financial backers.

"The purpose of the seed phase was to make absolutely sure that we could do this," founder and CEO Russell Hannigan told GeekWire.

If a follow-up Series A round comes together the way Hannigan and his team hope in the next couple of months, the venture could launch its first experimental "pathfinder" satellites by the end of 2020, setting the stage for a wave of operational satellites in 2022.

Hannigan discussed EarthNow's roadmap last week during an interview at Intellectual Ventures' Bellevue headquarters, which currently serves as the spin-out's base of operations. He'll be discussing the details with other satellite industry executives this week at the SmallSat Symposium in San Jose, Calif.

Founded in 2017, EarthNow emerged stealth mode just last April. The big idea behind the venture is to provide real-time and on-demand video streams showing virtually any location on Earth, thanks to a network of nearly 500 satellites in low Earth orbit.

Each roughly 200-kilogram (440-pound) satellite would be equipped with a system of four independently steerable telescopic cameras, feeding views into a patented edge processing system that could provide resolution as fine as a meter per pixel. There'd also be a wide-angle imaging system to add context.

"We're going to be delivering on the order of 20 frames per second, all the time," Hannigan said.

Hannigan said video views of targeted locations could also be archived for time-lapse comparisons. "You'll be able to 'rewind the Earth,' which will be super-powerful," he said.

Watching the world on a mobile app

The initial customers are likely to be government defense and intelligence agencies, but other applications could include patrolling the oceans for illegal fishing, monitoring farm fields to check crop health, and watching out for natural disasters.

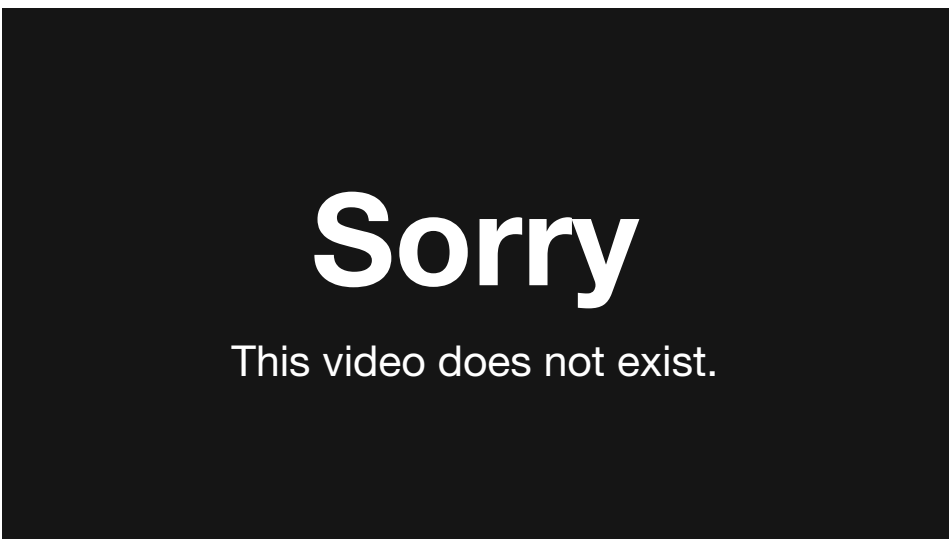
“To have a system that can detect a forest fire, literally the instant it starts, is going to save a lot of lives and a lot of money,” Hannigan said.

EarthNow isn’t yet sharing the details about its pricing model publicly, but Hannigan said government and commercial users might pay on the basis of minutes per month, or lease

capacity on a transponder to secure guaranteed access to an always-on view.

The wider public could well get in on EarthNow's stream via a smartphone app.

"We're going to produce some stunning views of the Earth, all the way out, all the way up," Hannigan said. "We have so much excess capacity, we're going to make that available in a broadcast kind of way. So you could have channels and channels and channels of stunning views. ... It could be the background on your TV. The point of it is, it's live. You're seeing it as if you're there."



Hannigan said EarthNow's mission complements efforts by ventures such as Virgin Galactic and Blue Origin to send passengers on suborbital space voyages.

“Everybody wants to go into space and see the Earth … but even with all the stuff that’s happening today, it’s still going to be a tiny fraction of the population,” he said. “What’s the next best thing? The next best thing is this ability we’re trying to create that will allow you to see the world in real time.”

But what about privacy? Will EarthNow’s users be able to track unsuspecting citizens from space? “With our system, at 1 meter per pixel, a human being is a dot, so I will not be able to say, in a crowd, who those people are,” Hannigan said

The same limitations rule out being able to read license plates on a car or truck, or even being able to identify the make and model of a vehicle reliably. “Privacy, from that point of view, is just physics,” Hannigan said.

How to build a satellite network

Airbus is tasked with building the satellites — using the same basic spacecraft framework, or bus, that’s being used for OneWeb’s broadband data satellites. “It’s the size of a washing

machine for the price of a 6U CubeSat," Hannigan said. (A 6U nanosatellite measures roughly 4 by 8 by 12 inches, or about the size of a shoebox.)

OneWeb founder and executive chairman Greg Wyler is an investor in EarthNow, cementing the companies' connection. There's another potential connection to Airbus as well: The European consortium could offer EarthNow's services as part of its satellite imaging portfolio.

In addition to getting the satellites built, EarthNow will have to fulfill the tortuous legal requirements for putting a satellite broadcast network in orbit.

"We have filed for spectrum," Hannigan said. "We did not do it through the FCC [Federal Communications Commission], we did it through another country. I don't want to say a lot more than that, but it's gone through, it's published. We're in really good shape there."

He said EarthNow has also been talking with the National Oceanic and Atmospheric Administration about getting its operating license, although the formal application hasn't been filed yet.

EarthNow founder and CEO Russell Hannigan holds a wide-angle imaging array that's meant to be used on the company's Earth-watching satellites. (GeekWire Photo / Alan Boyle)

Working out the details for ground stations is also on the to-do list. But Hannigan said one of the biggest tasks ahead will be to ramp up EarthNow from its current staffing level of 10 employees to roughly 30 to 40 over the next year or so.

Hannigan has had decades of experience working at companies ranging from Intellectual Ventures to Microvision to Teledesic, the ill-fated satellite venture backed by Gates and telecom pioneer Craig McCaw in the 1990s.

The fact that Teledesic was headquartered in Bellevue is one of the reasons why EarthNow got its start here. It was Teledesic that first brought Hannigan to the Seattle area, and some of EarthNow's consultants are old colleagues from Teledesic who now work at a Bellevue engineering firm called Avaliant.

"There are a lot of really smart, software-y people here," Hannigan said. "Could we wind up going somewhere else? Sure, of course. Will we need to be in the Beltway at some point soon? Absolutely, because those are going to be our initial prime customers."

For Hannigan, the out-of-this-world thrill of building a satellite network is intertwined with the down-to-earth challenge of building a successful business.

"It's fantastically fun. We get to design satellites, and talk to amazing people around the world, and do fun stuff," he said. "But it's hard. I don't know if 'scary' is the right word, but you wake up in cold sweats every now and again."

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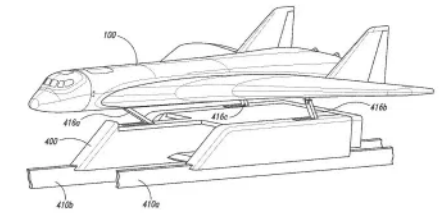

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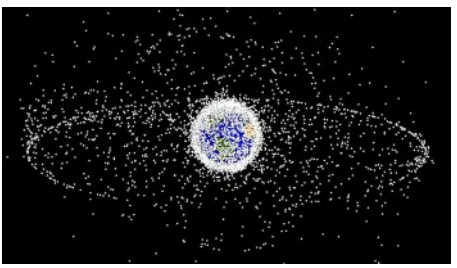

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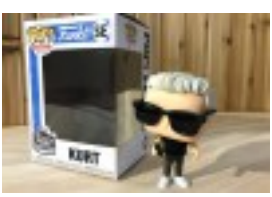

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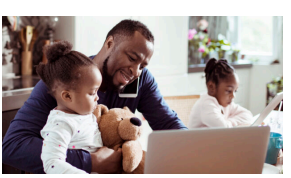

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