

TECH

SpaceX Indicates Satellite-Based Internet System Will Take Longer Than Anticipated

Even if two early satellites, rescheduled to launch Thursday, work as planned, ‘we still have considerable technical work ahead of us’



A SpaceX Falcon 9 rocket in Cape Canaveral, Fla, in February 2017. PHOTO: JOE SKIPPER/REUTERS

By Andy Pasztor

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SpaceX’s proposed internet-via-space project is slated to launch two experimental satellites on Thursday, even as the company tamps down expectations such prototypes will quickly evolve into a functioning global system.

Acknowledging there are no final cost estimates or engineering designs yet for its proposed broadband constellation, spokesman John Taylor revealed substantial delays from initial project timelines. In a statement provided exclusively to The Wall Street Journal Tuesday night, billionaire Elon Musk’s company signaled that development of its high-profile satellite network has been significantly slower—and seemingly more complex—than many inside and outside SpaceX originally anticipated.

The initial demonstration spacecraft, about the size of compact refrigerators and designed to pave the way for affordable, high-speed internet access spanning the globe, were scheduled to

blast into orbit Wednesday morning local time from Vandenberg Air Force Base on California's central coast. But the launch was delayed for a day because of winds.

The primary payload is a Spanish radar satellite, called PAZ, that will provide high-resolution radar images for commercial and government use. The presence of the two small satellites—dubbed Microsat-2a and -2b—have heightened media and public interest in the mission.

Even if the two early satellites “work as planned,” SpaceX said in Tuesday night's statement, “we still have considerable technical work ahead of us to design and deploy” some 4,400 similar satellites. The tentative goal of starting limited service by 2020 now appears unrealistic based on that language, but the company didn't provide an alternate schedule.

Though executives refrained from making public comments or going on social media to discuss technical or programmatic details of the satellites before the launch was scrubbed, Space Exploration Technologies Corp., which is the company's formal name, previously filed documents with the Federal Communications Commission indicating their intended mission and orbits. Mr. Musk's team earlier told the commission that by 2020, it planned to have the first batch of roughly 800 operational satellites circling more than 680 miles above Earth, providing internet connectivity comparable to the fastest ground-based options.

But Tuesday's statement, which offered the most detailed progress report in years about the venture, delivered a different message: SpaceX engineers are still considering the most appropriate and cost-effective space and ground technologies to embrace, without firming up subcontractors or completing production plans.

The statement, for example, emphasized that technical and financial details of anticipated ground equipment for subscribers—considered critical elements in any such project—are still undetermined. “Given that we are just at the beginning of this work,” SpaceX said, “we do not yet know what the cost will be” and therefore estimates by outsiders “should be considered extremely speculative.”

On Wednesday, Mr. Musk posted a tweet highlighting the uncertainty surrounding his satellite initiative. “If successful,” he wrote, the project “will serve least served” regions and communities.

One industry official said the company has been working with Taconic, based in Petersburg, N.Y., as a potential subcontractor to develop and supply circuit boards for consumer terminals, but no final decision has been made. Once there is a choice, industry officials said ramping up production likely would take several years. Spokesmen for SpaceX and Taconic declined to comment.

The satellite project, commonly called Starlink, was unveiled by Mr. Musk three years ago amid ambitious projections to deliver internet connections, especially to regions without such connectivity. “We’re going to try to do for satellites what we’ve done for rockets,” Mr. Musk told Bloomberg TV. But since then, he has generally avoided publicly discussing the initiative or its status.

Several rounds of FCC filings have spelled out technical details and a general timetable, but those documents don’t specify engineering progress, production plans or financing strategies for a price tag initially pegged at \$10 billion or more.

Gwynne Shotwell, the company’s president and chief operating officer, occasionally has tried to keep a lid on expectations by highlighting other company priorities, raising questions about the business case or alluding to the relatively small team of engineers assigned to Starlink.

Skeptics have challenged the assumption of a nearly unlimited market for internet access in developing countries.”The satellite industry has way too much capacity” world-wide at this juncture, meaning “it’s almost chaos” as service providers continue to slash prices to compete with ground-based offerings, according to veteran industry consultant Roger Rusch.

SpaceX’s challenges are emerging as one of its main rivals, OneWeb Ltd., is pushing ahead with construction of a highly automated satellite factory in Florida and indicates it is on track to begin offering limited internet links next year. With its FCC approval in hand, an initial fleet of more than 700 OneWeb satellites is expected to start offering services over Alaska next year. Residents of the state currently have limited options to connect to the internet. The company is targeting virtually world-wide service by 2021.

Founded by Greg Wyler, who initially attempted to join with SpaceX but then had a falling out with Mr. Musk over divvying potential profits, OneWeb and its manufacturing partner, Airbus SE, aim to shake up the satellite industry by introducing production practices that reduce time-consuming and customized hands-on assembly.

SpaceX’s satellites are designed to be heavier, more complex and presumably more costly than those OneWeb intends to deploy, according to industry officials. Mr. Musk opted for larger solar arrays, more-advanced antennas, greater computing power on board and laser links between individual spacecraft.

According to internal SpaceX financial documents prepared in the summer of 2015, Mr. Musk projected the satellite-internet business would have over 40 million subscribers and bring in more than \$30 billion in revenue by 2025. The documents showed operating income topping \$20 billion. SpaceX’s founder, chief executive and top designer has talked about using cash from the venture’s cash flow to fund his vision of eventually establishing human settlements on Mars.

SpaceX's plans envisioned launching 32 of its Falcon 9 rockets over roughly two years to deploy the first phase of the proposed satellite constellation. Its highest annual launch rate so far is 18 missions, and it already has contracts with dozens of paying customers waiting to have their payloads blasted into orbit before SpaceX satellites become primary payloads for company rockets.

Corrections & Amplifications

The photo of a SpaceX Falcon 9 rocket in Cape Canaveral, Fla., with this article was taken last year. An earlier caption incorrectly said the photo was taken this year. (Feb. 21, 2018)

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