



Space 102: Why are we up there?

Solving problems on Earth, and beyond.

SpaceX made space cool again. Depending on your generational identity this statement is either: 1. A well-known fact, 2. A boring, un insightful comment, or 3. A disappointing view into the state of the world. Taking things back to the Cold War, space was exciting for two reasons: spying and bombing (missile-ing, really, on an intercontinental scale). NASA was the public-facing research and development wing of the United States' space program, and the Department of Defense was the bill-payer. Then the Soviets quit. Shortly after that the US defunded NASA. Space was forgotten in the public eye in the 1990's. The Global Positioning System opened up, and everyone thought it was something you put in a receiver on the ground. The military kept building more bespoke solutions which only accelerated in the early 2000's. To the rest of the US population, space was forgotten. Rocket club memberships dwindled nationally, and astronauts had to start paying for their own drinks at bars. These were dark times. Then along came a super-nerd who figured out a way to get all that lost lunch money back, plus some (billions) more. With his newfound wealth he went back to a childhood dream, and built a rocket company. Enter Elon Musk, and the rise of SpaceX.

Of course SpaceX wasn't the only thing happening: all across the ecosystem of space (launch, sensor technology, communications, processing power, to name a few) costs were plummeting and quality was improving. Space became affordable to smaller and smaller companies. So what to do with this now-attainable domain? Well, it all depends on what problem you're trying to solve. We put these in three main categories: Earth Observation, Earth Infrastructure, and Space Infrastructure.

Earth Observation - Boomers kicked this off

Space is the ultimate vantage point, the supreme 'high ground' from an Earth-bound perspective. You can cover more territory moving at 4.3 miles per second than you can with anything stuck inside the atmosphere. (A commercial airliner flies at ~0.1 miles per second. And satellites keep up the pace, all day, everyday.) So cameras from space were an obvious choice. And then other, more sophisticated, sensors came into the mix that increased collection ranges past the visible spectrum, provided active energy 'radar' that could 'see' through clouds, and other solutions. And all of this is provided in near-real-time back to Earth. If you yearn for a global perspective or broad-scale intelligence, space is a part of the mix today. (Teaser: Low-Earth Orbit is a useful orbit.)

Earth Infrastructure - Staying remote with Gen X

Some things are better when high. Let's rephrase: altitude enables improved capabilities for certain Earth infrastructure functions. Perhaps the first infrastructure function to adopt space was the communications industry.

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Satellites parked in geostationary orbit maintain position over the same spot on Earth AND are far enough away that their field of view covers almost a third of the planet. Put three of these satellites up equidistant from each other over the equator (e.g. 0° , 120° , and 240°) and you're covering nearly all of the human population with DirectTV.

Another example is GPS, an earth infrastructure function that works best from space. Put another way, Space put the "Global" in GPS.

Space Infrastructure - Okay, Zoomer

There are so many satellites on orbit that operating, servicing, refueling, and repositioning them has become its own market. This has really only just begun. The infrastructure built around this will enable similar architectures around other places, like the moon, and asteroids, and other planets. It is crazy to think about now, and unimaginable a few years ago... at least for one of those aforementioned generational identity categories.