

A map of the Eastern United States and surrounding regions, including parts of Canada and Central America. A yellow line runs diagonally from the top right towards the bottom left, passing through the Northeast and the Southeast. A red arrow points from the upper left towards the line, specifically towards a point in Kentucky. Various cities and states are labeled, including Chicago, New York, Washington, Atlanta, and others. The Gulf of Mexico and Caribbean Sea are also visible.

Cessnas in Space:

*Tracking the
International
Space Station
from Your
Backyard*

Cessnas in Space: Tracking the International Space Station from Your Backyard

By Mike Jones

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OK, I confess — I'm an old codger. Retirement is looming. The check-out girl at the grocery store gives me the "senior citizen" discount without asking. I'm seeing more doctors than a sexy nurse, and recently I've been going to a lot of funerals. It's all very discouraging.

But one of the advantages of seniority is a strong historical perspective. You young whippersnappers may not recall the day, but on August 12, 1960 the U.S. launched into orbit a 400 lb. metalized balloon. As it circled the earth every 90 minutes scientists at the Jet Propulsion Laboratory in California bounced microwave signals off the balloon which were detected at Bell Labs in New Jersey; they heard the "echo."

This launch was big news. The news coverage was extensive and effusive because, at that time, successful U.S. launches were rare. If you're unimpressed by that technology, consider this: In my home, we had one telephone and it was in the kitchen. It was a party line with a rotary dial. We had one television with rabbit-ear antennas; there were three TV channels. Every Woolworth's store

featured a vacuum tube tester for troubleshooting home electronics. Believe me, a rocket launch was amazing technology.

Because Echo was 100 feet in diameter it was the first satellite — and there weren't many in those days — which could be seen from the ground. An evening or two after the launch my father bundled all four of us kids into the Oldsmobile. We parked at the top of Selden Hill, in West Hartford, CT and, along with dozens of neighbors, we peered westward into the star-speckled blackness, unsure of what we actually would see. My father kept checking his watch. My mother fussed with Redsy, our cocker spaniel. My sister wanted to know when she could go home. Suddenly a tiny, glistening silver star appeared in the west, dashed across the Hartford sky and dove into the night to the east. We saw Echo, we gasped, and we cheered.¹



The International Space Station is a technological marvel, racing along 230 miles over our heads. Sunlight reflects off the giant solar panels to make it the brightest object in the sky (except the moon). There are thousands of smaller satellites which also can be seen with the naked eye.

¹ The ECHO project ended when the device re-entered Earth's atmosphere, burning up on May 24, 1968. See: https://en.wikipedia.org/wiki/Project_Echo.

Fascinatin' stuff, you say politely, but your point is?

It's a tale worth telling for three reasons. First, it's relevant because Cessna airplanes and pilots have been at the heart of our space program from the very beginning. Secondly, most pilots enjoy a bit of science and technology. Lastly, satellite-watching is inspiring, and worthy of sharing with neighbors, kids and colleagues. They will be impressed with the satellites and you.

Cessna in Space

Since the very beginning, Cessna has been training pilots. It's a simple economic model: the more pilots you train, the more customers you have. But many people are unaware that some — if not most — astronauts obtained their first training in military Cessnas while others began their flying careers banging civilian Cessnas “around the patch.”²



The Cessna “Mescalero” was an off-the-shelf Cessna 172 which served as the primary trainer for the U.S. Air Force and the U.S. Naval Academy for nearly 30 years, training thousands of military pilots just as it trained thousands of civilian pilots. Photo courtesy Bravo Zulu Repaint Studio and used with permission.

² Cessna also produced the T-37 “Tweet” which was a primitive, twin-engine, tandem-seat trainer responsible for destroying the hearing of thousands of young flight cadets, but that’s another story.

The much-beloved Cessna Skyhawk was the official *ab initio* trainer for the Air Force and the Naval Academy from 1964 to 1993. More than 800 off-the-shelf “Mescaleros” were purchased, in a variety of configurations. Thousands of military flyers, including many U.S. astronauts, began their careers in a Cessna.

Other astronauts learned to fly on their own dime, like astronaut Shannon Walker. She’s been flying since 1995 and started in a Cessna 150. I have not been able to confirm other initial training aircraft, but Neil Armstrong — the first person to walk on the moon — soloed at age sixteen. Pete Conrad was flying at fifteen near Paoli, Pennsylvania, bartering odd jobs for airplane flights. John Glenn earned his private ticket in 1941 long before starting his military career. A local attorney taught Gus Grissom the basics of flight in Bedford, Indiana while Alan Shepard washed planes in exchange for rides. It’s highly likely Cessnas helped build the skills which took these men and women into space.

What’s Up?

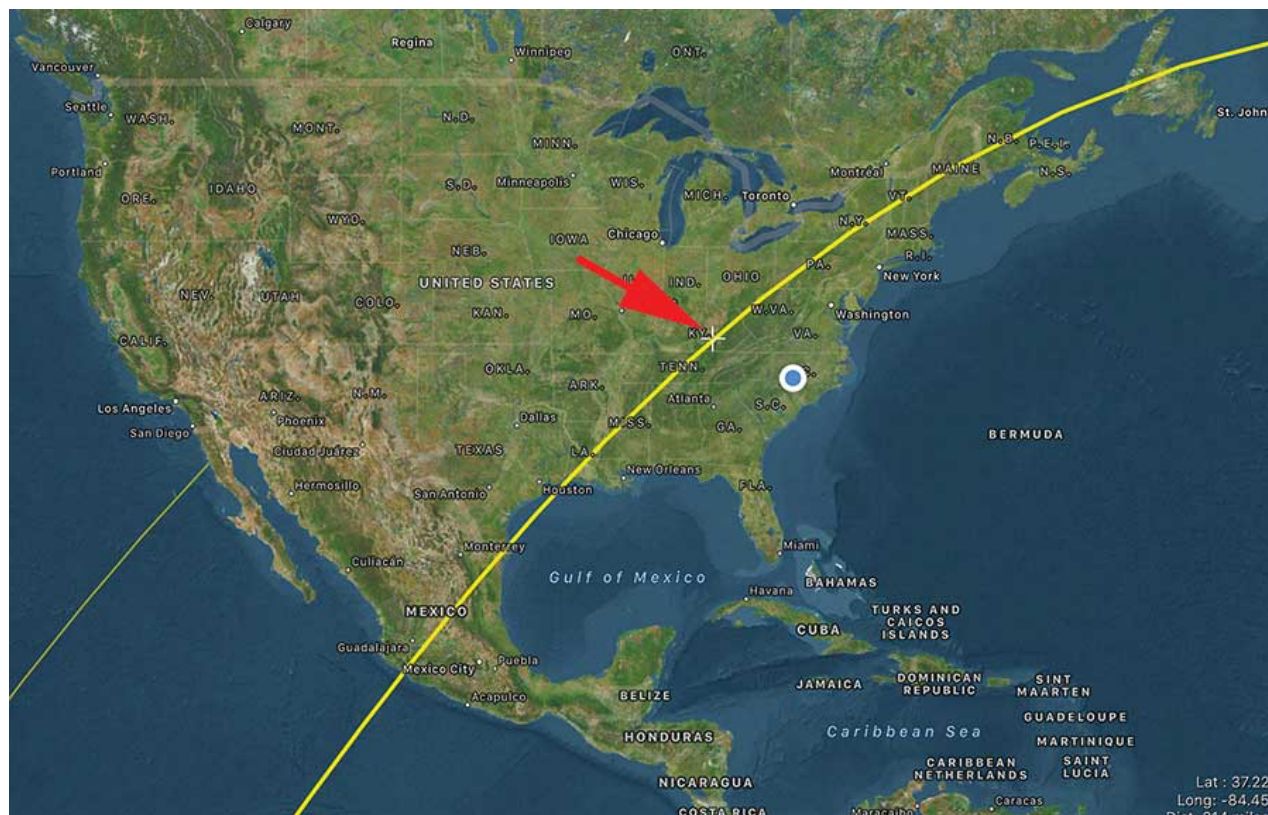
Today there are more than 1,000 active satellites in orbit, mostly used for communications and imaging. Many are sufficiently large to be seen from the ground. Two are standouts: the International Space Station (ISS) and the Iridium satellites.³

We all know about the space station. It’s the most complex machine ever built. It weighs 400 tons and includes laboratories, solar panels, fuel tanks and housing facilities, all of which was slowly assembled over forty Space Shuttle launches. 27,000 square feet of solar panels catch the energy of the sun, making it the brightest object in the sky.

³ I was fascinated to learn there are another 2,000 dead satellites and more than 500,000 pieces of “space junk” in orbit the Earth. This includes nonfunctional spacecraft, abandoned launch vehicles and a pair of needle-nose pliers Scott Parazynski lost during a spacewalk.

The Iridium network is a collection of 72 small satellites. They are too small to see from the ground but they feature three extremely shiny door-sized antennas. These can catch the glare of the sun unexpectedly. If you're in the right spot at the right time, you'll see a brilliant reflection for 5 to 7 seconds, called an "Iridium flare."

Satellites actually don't fly. In fact, satellites actually are just very large bullets fired at very high speeds. Just like any bullet, or a baseball, golf ball, or any other unpowered moving object, they constantly are falling back to earth. But they're travelling so fast the rate at which they fall matches the curvature of the earth. The Iridium satellites, the ISS, and the Hubble Telescope all go about 17,000 mph which is 4.5 miles per second. This is enough speed to put them in Low Earth Orbit between 200 and 1200 miles up.⁴



Using the iPad app "ISS Spotter" it's easy to track the Space Station and be ready to see it when it pops over the horizon. In this instance, even though the ISS was over Lexington, KY—about 350 miles away—it would have been easy to spot from my home (the blue dot) except that it was late morning and the sky was too bright.

⁴ Satellites can go faster, but the faster they go the farther from Earth they will orbit. At 25,000 mph the satellite will break free of the Earth's gravity ("escape velocity") and zoom into space. That's how you get to Mars.

Orbiting satellites always travel in a straight line. The ISS was intentionally launched away from the equator and travels as far as 50° north and south as it loops around the globe but the actual flight path always is a straight line. The sine-wave pattern you see on a map is an artifact of displaying a circular shape on a flat surface (the “Mercator projection”). Additional complexities include the Earth’s rotation beneath the bird and the tilt of the Earth’s axis.

Which brings us to your favorite AppStore. As in so many things today, there are several satellite-spotting apps which can advise you when and where to look. It turns out that space flight, while extremely risky, complex and expensive, also is extremely predictable.

When to Look

The first secret to spotting the satellites is to know the best time to be peeking. Twilight with clear skies and unobstructed views of the horizon are optimal. Other than a comfortable chair and a glass of Scotch, no equipment is required: the naked eye works best. Sit and look towards the darker sky either 90 minutes before sunrise or 90 minutes after sunset. Any earlier or later, and both you and the satellite will be in the shadow of the earth and you won’t see anything. That’s why my dad took us up on the hill to see Echo after dinner.

The ISS never hits over the same spot during sequential transits. It completes an orbit in 90 minutes but by the time it returns to its starting point the Earth has rotated 20 degrees beneath it. The ISS actually will pass over the same spot every three days — but maybe not be at twilight. It takes patience: every 63 days the ISS will re-appear over exactly the same spot at the same time of day.

What will you see? Well, there are thousands of satellites. My personal best is four satellites spotted in one session.⁵ But if you specifically want to see your

⁵ Editor’s note from 2026: The author’s personal best is now up to 27 satellites in one sitting, courtesy of Elon Musk and his Starlink network of 12,500 satellites.

tax dollars at work, go to the NASA web site and sign up for “ISS alerts.” Several times each week, NASA computes ISS sighting opportunities for thousands of locations. If you’re near one they’ll send you a text describing when and where, so you see what \$150 billion can buy. Here’s the URL:

<https://spotthestation.nasa.gov/>



The bright “star” by the red arrow is the Space Station crossing over my home above Southern Pines, NC. The ISS is slightly blurred in the photo because it’s moving at 4.5 miles per second. Satellites are easy to detect because they are the only objects in the sky moving so quickly which don’t use flashing position lights.

But that only works if you’re at home. If you travel, a better option is an app which uses the GPS on your cellphone to determine when you will might grab a glimpse. I use “ISS Spotter” and find it simple and reliable. NASA developed the “Skywatch” app but I found it less convenient. Another option is “ISS Locator” which some reviewers describe as “fairly basic.”

Jumping up in complexity, consider “SkySafari 5”, “Star Walk 2”, “NightSky”, “Star Chart”, “Stellarium” and “Sky Guide.” These are dedicated space-tracking apps. They will send a

heads-up to your phone a few minutes before a sighting. “NightSky” is

extremely entertaining, with satellites, constellations and other features. All are available from your favorite app store.

What You'll See

Satellites can be dim or bright, depending upon the darkness of the sky, the angle to the sun, their shape, the angle of their solar panels, and pollution or clouds blocking your view. Most satellites are steady, white, fast-moving pin-points, usually brighter than stars, faster than airplanes and without any engine noise. However, dead satellites tumble and can brighten and dim while you watch. If you see a fast-moving object with flashing lights, it's a plane.

The most surprising aspect of ISS watching is the distance from which you can see it. The other night, I was in Gainesville FL and saw the ISS north of Atlanta, 300+ miles away. Once I watched it for fifteen minutes while sitting at a restaurant in Tacoma and by the time we finally lost it over Idaho — 400 miles to the east — all the guests in the restaurant were outside on the deck cheering. Some nights I can catch the ISS as it dashes past Bermuda, 700 miles to my east. My most memorable ISS spotting was in India last February when I showed the glowing ISS to 400 people at an outdoor wedding. Yes, I actually stopped a wedding. I have no pride.

There's a point to all this. There is no doubt in my mind that our sturdy Cessna planes have helped move humanity into space and someday to the planets. The disciplines of flying are essential to this adventure. Flying is all about engineering, math, process control, risk management, communication skills and more — the same crucial skills which make space travel possible.

Let me push this even further. Somewhere in America today there is a special kid. He or she doesn't know it yet, but that kid is going to get hooked on aviation. This child will hang out at airports, probably learn to fly a Cessna, and learn to respect checklists and winds. This person will become a grown-up and

gradually forget the details of those early years but never lose the skills that made them possible. And those skills will enable him or her to go to Mars.

Yes, it's true. The first person to walk on Mars is sitting in an American elementary school today. We're that close. The time is coming. The science is ready. The technology is here.

Personally, I plan to sit in my backyard and watch that launch, toasting them with a glass of single malt. I will be proud of all of the Cessna pilots who contributed to our uniquely American culture of flying, who give kids Young Eagle rides, who speak at "Career Day" seminars, and who swap rides for a little soap and water and elbow-grease. Just as a sturdy wall is made with thousands of little bricks, the first person on Mars will get there on the strong foundation of general aviation.

Look to the stars at twilight, and see the future of mankind.

About the Author

Dr. Mike Jones is an entrepreneur who uses his business expertise to help G.A. airports across the country improve their governance and operations, speeding them on their way to more revenues, grants, and community support. He also helps protect them from avaricious developers and reverse the damage caused by ineffectual politicians. He's been writing for this magazine for nearly a decade, flown 800 Young Eagle missions, and put 4,000 hours in his logbook. He's always accessible at PilotMike2012@gmail.com.

