

What is a Surveillance Balloon?

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In news– The US military has downed the suspected Chinese spy/surveillance balloon over the Atlantic Ocean.

About spy/surveillance balloon-

- A spy balloon is literally a **gas-filled balloon that is flying quite high in the sky**, more or less where commercial airplanes fly.
- It has some sophisticated **cameras and imaging technology on it**, and it's pointing all of those instruments down at the ground.
- It's collecting information through photography and other imaging of whatever is going on down on the ground below it.
- **Most of these balloons literally go where the wind blows.** There can be a little bit of navigation, but there are certainly not people aboard them. **They are at the mercy of whatever the weather is.**
- **They sometimes have guiding apparatus on them** that change a balloon's altitude to catch winds going in particular directions
- **There is an internationally accepted boundary called the Kármán Line at 62 miles (100 kilometers)** altitude which limits a nation's airspace.

Why would someone want to use a spy balloon instead of just using spy satellites?

- **Satellites are the preferred method of spying from overhead.** Spy satellites are above us today, typically at one of two different types of orbit.
- **The first is called low Earth orbit**, and, as the name suggests, those satellites are relatively close to the

ground. But they're still several hundred miles above us.

- For imaging and taking photographs, the closer you are to something, the more clearly you can see it, and this applies to spying as well.
- The satellites that are in low Earth orbit have the advantage that they're closer to the Earth so they're able to see things more clearly than satellites that are farther away.
- **The disadvantage these low Earth orbit satellites have is that they are continually moving around the Earth.**
- **It takes them about 90 minutes to do one orbit around the Earth.** That turns out to be pretty fast in terms of taking clear photographs of what's going on below.
- **The second type of satellite orbit is called geosynchronous orbit,** and that's much farther away. It has the disadvantage that it's harder to see things clearly when you're very, very far away.
- But they have the advantage of what we call persistence, allowing satellites to capture images continuously.
- In those orbits, you're essentially overlooking the exact same piece of ground on the Earth's surface all the time because the **satellite moves in exactly the same way the earth rotates** – it rotates at the exact same speed.
- **A balloon in some ways gets the best of those. These balloons are much, much closer to the ground than any of the satellites, so they can see even more clearly.**
- And then, of course, balloons are moving, but they're moving relatively slowly, so they also have a degree of persistence.
- Surveillance balloons can also be capable of “gathering electronic signals” and intercepting communications.
- **However, spying is not usually done these days with balloons because they are a relatively easy target and are not completely controllable.**

