

How many satellites are orbiting the Earth in 2017?

This is our annual update on the satellites currently orbiting the Earth.

How many satellites are orbiting the Earth?

According to the Index of Objects Launched into [Outer Space maintained by the United Nations Office for Outer Space Affairs \(UNOOSA\)](#), there are 4 635 satellites currently orbiting the planet; an increase of 8.91% compared to last year.

So far in 2017, UNOOSA has recorded 357 objects launched into space. This is almost 50% more than have ever previously occurred in a single year, and there are still a significant number planned during the rest of the year.

This increase is fuelled by small satellites and cubesats. New technology has significantly reduced the cost to design, build and launch these, and this has been accompanied with an increase in commercial providers becoming involved in the market. A [report issued](#) earlier this month by the Satellite Applications Catapult predicted that 1 300 of these satellites will be launched over the next three years. If you consider that just under 7,900 objects have been launched into space, this would equate to 16.5% of the total launches over the last 60 years!

How many of these orbiting satellites are working?

The [Union of Concerned Scientists \(UCS\)](#) keeps a record of the operational satellites and you may be surprised to know that only 37.5% of the orbiting satellites are active, just 1 738 according to the August 2017 update.

This means that there are 2 897 pieces of junk metal hurtling around the Earth at high speed!

What are all these satellites doing?

According the UCS the main purposes for the operational satellites are:

- Communications: 742 satellites
- Earth observation: 596 satellites
- Technology development/demonstration: 193 satellites
- Navigation/Positioning: 108 satellites
- Space observation: 66 satellites
- Earth science: 24 satellites
- Space science: 67 satellites
- Space observation: 9 satellites

Although, it should be noted that some of the satellites have multiple purposes. We'll examine the Earth observation category in more detail in a future blog.

What is Technology Development/Demonstration?

This is quite an intriguing purpose as it should give an idea of what is happening in the industry, and perhaps unsurprisingly the UCS data has little information on what these satellites are actually doing. However, some insights can be gained by looking at the operators of, and countries controlling, these satellites.

Looking at the uses for these satellites:

- 33 have military uses with 80% of these being the USA, the rest from China, Russia and France.
- 56 have government uses and most of these are operated by National Space Agencies, or associated bodies. China has 52% of these satellites, followed by USA.
- 65 have Civil uses and these are mostly run by University's or similar educational establishments.
- 39 have Commercial uses.

There are 33 different countries operating technology development/demonstration satellites with the USA leading the way having 63, followed by China with 41 and Japan with 19. After this it is mostly just one or two satellites for each country.

Who uses the satellites?

The four categories of users in the previous section can also be reviewed for all satellites, such that:

- 788 satellites are listed as having commercial uses
- 461 with government uses
- 360 with military user; and
- 129 with civil uses

Although, it should be noted that almost 14% of the satellites are listed as having multiple uses.

Which countries have launched/operate satellites?

According to UNOOSA 70 countries have launched satellites, although this is slightly complicated by the fact that a number of satellites have also been launched by various institutions such as the European Space Agency.

Looking at the UCS database, there are 66 countries listed as currently operating satellites, which means around 25% - 33% of the world's countries have eyes in space (depending on how you define a country/territory!) There is an interesting infographic on the [UCS site](#) showing the change in countries operating satellites between 1966 and 2016.

In terms of countries with the most satellites, the USA significantly leads the way with 803

satellites, almost four times as many as China who is next with 204 and followed by Russia with 142.

Interesting Facts!

Just a few of the interesting things we've pulled out of the UCS database:

- The oldest active satellite is the Amsat-Oscar 7 communications satellite which was launched 43 years ago today! (15th November 1974)
- Planet operates the largest number of satellites with their constellations accounting for 191 of current active satellites – although with Planet this could have gone up already! Second largest operator is Iridium Communications with 83 satellites.
- 61.6% of operational satellites are in low-earth orbits (LEO), 30.6% in geostationary orbits, 5.6% in medium-earth orbits and 2.2% in elliptical orbits.
- Of the LEO, 55.4% are sun-synchronous, 25.6% are non-polar inclined, 15.6% are polar, 1.9% are equatorial, 0.8% are elliptical and 0.1% are cislunar (and yes, we had to look that one up too!) The remainder did not specify an orbit type.

When you look up!

Next time you gaze up into the sky looking at that stars, think about the 4,500 or so hunks of metal twinkling up there too!

