

Lost in space

When what goes up
does not come down...

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Nearly 6'000 satellites have been launched into Earth's orbit since the first space launch in 1957. Of these, over half continue to orbit today, the remainder having re-entered the Earth's atmosphere. Of the 3'200 satellites still in space, only around 500 are currently active. Half of them are communications satellites, with the remainder being for scientific and military purposes.

In addition to these satellites, many thousands of pieces of debris are circling the globe too. This includes spent rocket stages, pieces of satellites which have exploded, and even tools accidentally lost by astronauts during space walks. Sophisticated radar and optical tracking systems on the ground are able to detect and monitor more than 8'000 of these objects, some of them as small as five centimetres in diameter.

All of this data is maintained by the US Air Force to enable commercial satellite operators, space agencies, and governments to assess the threat of collision between active satellites — including the International Space Station — and space debris. Satellites can be moved or re-oriented to minimise the possibility of a collision and the resulting damage.

Commercial satellites are worth \$250 million or more, and can generate over \$1 billion in revenue each year. With so

much riding on each satellite, operators are naturally interested in understanding the consequences of space debris.

In the past several months, the debris build-up has grown by an astonishing 25%, due to the Chinese anti-satellite (ASAT) missile test in January 2007, and the breakup of two Chinese satellites and two Russian rocket stages. This new debris is in low Earth orbit, so the majority of commercial communications satellites are unaffected. Nevertheless, the risk to the International Space Station and to numerous scientific and military satellites has been vastly heightened.


Space debris occasionally re-enters the atmosphere, often with a spectacular display commonly mistaken for a meteorite. In January 2007, a family in New Jersey in the US found a hole in their bathroom ceiling and a mysterious metallic object impaled in the wall. At first it was believed to be a meteorite, but on closer inspection, it proved to be a piece of a satellite or rocket. Fuel tanks and other hardware from spent rockets are occasionally found to have re-entered the atmosphere and landed intact on the ground.

The debris problem will continue to grow, because more objects are being put into orbit than are re-entering the atmosphere, creating a net increase in debris.



Unfortunately, there is little that can be done about the vast bulk of the objects, as they are simply scraps of debris floating in orbit. The largest items can be avoided by manoeuvring around them, although this takes time and energy, i.e., some form of propellant.

Happily there are no reported injuries from space debris, although the risk is real, and launch vehicle operators (or rocket operators) are required to buy liability insurance to cover damage and injury on the ground.

XL Insurance provides coverage for physical loss or damage to satellites and launch vehicles, as well as for third party liability resulting from space activity, including collision with debris and re-entry into the Earth's atmosphere. 

THIS PAGE: Peter Bilsby (left), Head of Global Aerospace, Chris Kunstadter (right), Senior Underwriter, Space