

ILLUSTRATION BY PITCH INTERACTIVE

THE PROBLEM OF SPACE JUNK



Altitude classification

LOW EARTH ORBIT Most space activity happens at low altitude, which is cheapest to reach.

MEDIUM EARTH ORBIT This relatively empty zone is a sweet spot for navigation satellites.

GEOSYNCHRONOUS ORBIT The 24-hour orbit fixes satellites above one longitude on Earth.

HIGH EARTH ORBIT Satellites here can monitor the solar wind or large areas of the planet.

Countries with most active satellites

U.S.	445
Russia	115
China	110
Luxembourg	92
Japan	50

Types of satellites



Communication	627
Imaging	137
Science	93
Navigation	92
Technology tests	72
Signals intelligence	48
Other	35
Weather	30

Countries with most pieces of debris

Russia and U.S.S.R.	6,063
U.S.	3,886
China	3,644
France	481
Japan	147

Types of debris

1,709	Rocket body
2,449	Satellite
10,680	Other

More than 100 million objects orbit our planet, experts estimate, but only 1,134 of them are operational satellites. The rest is space junk: moribund satellites, discarded rockets, and millions of smaller pieces of debris, the result of in-orbit collisions. The Joint Space Operations Center—part of U.S. Strategic Command—tracks about 17,000 of the largest objects, including active satellites. Until now, little has been done

to mitigate the space-junk problem, but two proposed missions could change that. DARPA's Phoenix program [page 54] would launch incomplete nanosatellites into space that could make themselves whole by harvesting working pieces from retired satellites. And CleanSpace One, a Swiss satellite due to launch in 2018, would clear low Earth orbit by directing debris into the atmosphere to burn up. —KATE BAGGALEY

SOURCES: THE DATA USED TO BUILD THIS GRAPHIC WAS PROVIDED BY THE UNITED STATES JOINT SPACE OPERATIONS CENTER (JSPOC) VIA WWW.SPACE-TRACK.ORG. ACTIVE SATELLITE DATA COURTESY JONATHAN McDOWELL, HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS. DATA CURRENT AS OF OCTOBER 2013.

*Totals include 20 active satellites and 48 pieces of debris above 50,000 km, which are not pictured.