

Clunkers in space

What can be done about the dangerous junk that litters space?



WHEN the Soviet Union launched *Sputnik* in 1957, few realised that this symbol of Communist *chutzpah* heralded the start of an information revolution. Today, with thousands of satellites orbiting the Earth, it is easy to forget how essential they are for such things as helping people plot journeys accurately, studying the planet and making phone calls.

In the 1970s space was seen as too vast to fill up. Forty years on, this Big Sky theory is being proved wrong. Things are getting rather crowded between 700km and 1,000km up—a region favoured for telecommunications and Earth observation. Old satellites, chips of paint and jettisoned rocket stages are hurtling around the world at thousands of kilometres an hour. Even a tiny fragment of such junk can destroy a satellite. There is ever more debris, thanks to a recent Chinese anti-satellite test and an accidental collision of two communications satellites. And it can take centuries to fall to earth, with the small pieces burning up in the atmosphere (see page 61).

Crashing bores

There is little punishment for bad behaviour. Under the Outer Space Treaty of 1967, governments bear liability for “objects” launched into space. But nobody knows if a fleck of paint, a particle of frozen astronaut’s urine or a fragment broken off a satellite count as an object: there is no case law. And nobody is even sure whether any state would want the diplomatic trauma of pursuing another for the loss of a satellite in orbit (although the Russians did pay to clean up radioactive debris from one of their satellites that landed in Canada).

One option is to do nothing, and leave it to satellite owners to make their spacecraft more disposable. Sadly that looks likely only to increase the frequency of collisions, generating yet more junk and making it so expensive that a valuable orbit becomes unusable. Some rules and a system to enforce them, then, are surely necessary.

Two things need to be done. One is to stop creating more junk by building better controlled self-destruction into satellites. Technologically this is not difficult. It means reserving some of a satellite’s precious fuel for the end of its life to slow it down, so that it burns up in the atmosphere or falls into the sea. Satellite owners resist this because they want to use fuel for more valuable things: a satellite that cannot manoeuvre is more or less useless. A deposit payable on launch, to be refunded when a satellite is disposed of safely, could deal with this by giving value to that last, self-sacrificial rocket blast.

The second task, cleaning up the junk that is already up there, requires new technology. Powerful lasers might shoot down small pieces of debris. Satellites specially designed to collide with junk might slow it to the point where it can fall into the atmosphere of its own accord. And missions to the biggest bits of junk might attach retro-rockets to them, to the same end. All this would be expensive, but a global clean-up fund could be created by charging operators of spacecraft a levy based on their crafts’ potential for generating debris.

Who could administer this? Any single country that developed such means for clearing up space junk risks being suspected by its rivals of creating an anti-satellite weapon. But such fears could be allayed through international co-operation. In this case America, Russia, China and the European Union all have an interest in clear skies. This is one of those rare cases where a focused UN agency could make sense. ■