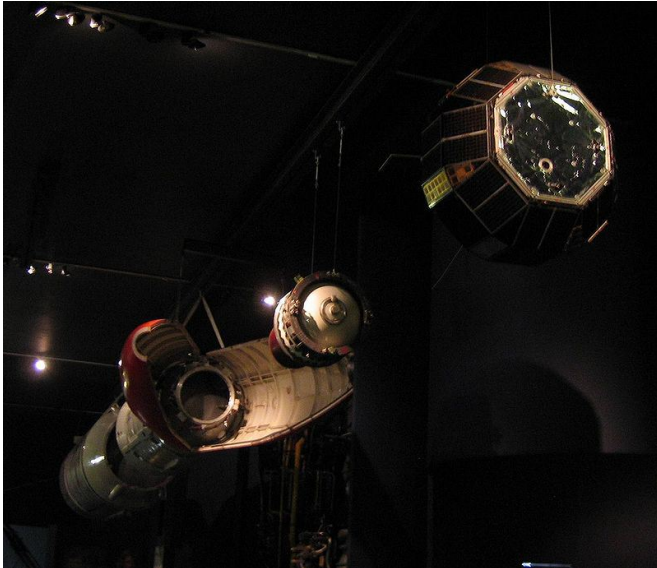


# Hunting Prospero

29 October 2015, by David Dickinson



Deployment of Prospero on display at the British Science Museum. Credit: Martin Addison/Wikimedia Commons under a Attribution Share-Alike 2.0 license

A relic of the early Space Age turns 44 years old this week.

The United Kingdom's first and only successful space launch using a UK-built rocket is still visible in low Earth orbit today, if you know exact where and how to look for it.

Launched atop a 3-stage Black Arrow R3 rocket on October 28th, 1971 from the Woomera launch station in the Australian outback, Prospero (sometimes also referred to simply as the X-3) was designed to test key communications satellite technologies.

Prospero wasn't the first satellite fielded by the United Kingdom—that credit goes to the Ariel 1 satellite launched atop a Thor DM-19 Delta rocket by the United States from Cape Canaveral on April 26th, 1962—but Prospero was notable as part of a program cut short in its early stages.

The Black Arrow project from which Prospero was born was cancelled shortly after the launch, making the X-3 the only successful mission fielded by the program (X-2 failed to achieve orbit due to an early shut-down of the stage 2 rocket). Prospero almost didn't make it as well, as the final Waxwing stage hit the satellite upon deployment, taking one of Prospero's four radio antennae clean off!

## How to spot fainter satellites

Unlike watching for bright passes of naked eye objects in low Earth orbit such as the International Space Station, hunting for binocular satellites such as Prospero takes careful planning. Our tried and true technique is not unlike the method recently described on Universe Today to hunt for near Earth grazers such as the Halloween asteroid 2015 TB 145. In stakeout mode, you'll need to know exactly when Prospero passes near a bright object, such as a star or planet.

Heavens-Above is a great resource, and catalogs every satellite back through the early Space Age. And what's really nifty is that Heavens-Above will plot the passage of the satellite showing the timing of the pass against the sky against the background of constellations and stars for your specific location.

If you have Space-Track access, you can also download the TLEs (Two Line Elements) for a particular satellite for manual entry into a program such as Starry Night or Orbitron to forecast passes. You'll be aiming your binoculars at the target star Project Moonwatch-style at the appointed time, and simply waiting for the satellite to drift by. For precise timing, we like to listen to WWV radio broadcasting the time (in Universal or Greenwich Mean/Zulu Time) out of Fort Collins Colorado on AM shortwave 5000, 10000, 15000 and 20000 Hz. WWV radio calls out the time at the top of each minute, with time ticks for each second, allowing the observer to keep eyes on the sky continuously. Just which WWV station comes in clearest can vary after sunset, as the ionosphere changes in terms of radio reflectivity at dusk.

We tracked down a good pass on the errant 'space tool bag' lost by International Space Station astronauts back in 2008 using this method once it was assigned an individual NORAD ID number... there it was, a lost tool satchel with a date with a fiery reentry destiny, drifting right by the bright star Spica at the appointed time.

Other relics of the Space Age are also visible in backyard near you, including:

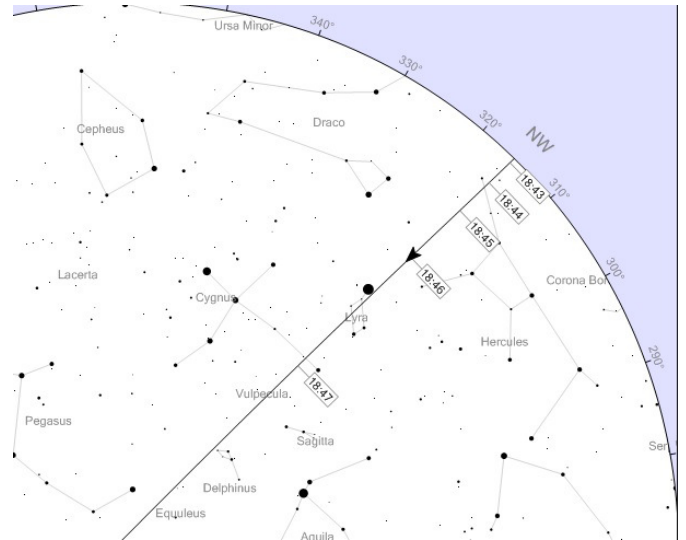
**Prospects for Prospero**



The launch of Prospero. Credit: ESA

Radio operators tracked Prospero for decades on transmission frequency 137.560 MHz until 2004, eight years past its official deactivation in 1996. As of this writing, there aren't any official future attempts to contact Prospero in the works, though it's certainly possible for a motivated party to do in theory... Prospero isn't expected to reenter until 2070, and perhaps it'll last until its centenary in space.

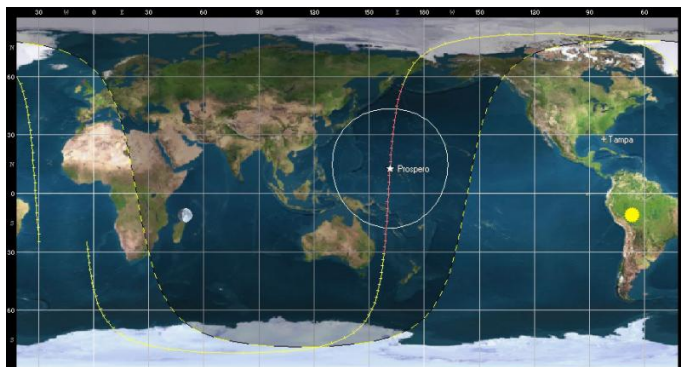
For latitudes 30-40 degrees north, good viewing prospects for Prospero start up again around December 20th of this year at dusk. At its brightest on a pass straight overhead through the observer's zenith, expect Prospero to reach about +8 magnitude in brightness, well within range of binoculars. Prospero orbits Earth once every 103 minutes in a 527 by 1,304 kilometre orbit, inclined 82 degrees relative to the Earth's equator. Prospero's NORAD ID COSPAR designator is



A screen capture of a satellite pass from Heavens-Above. Credit: Chris Peat/Heavens Above.com

- The Vanguard: launched in starting in 1958 by the United States, The three Vanguard satellites represent the oldest bits of human artifacts in Earth orbit, and they aren't due for reentry for another two centuries.
- Allouette-1: The first Canadian satellite, launched from Vandenberg AFB in 1962 and still in orbit.

Tracking relics of the Space Age brings home the personal relevance of early space history. Looking further out towards satellites in geostationary orbit, we are seeing artifacts that may long withstand the tests of time and become the solitary testaments of our current civilization to a far off future era.



The orbital trace of Prospero. Credit: Orbitron

Source: [Universe Today](#)

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