

Magellan's last dramatic quest

NASA's \$750 million Magellan space probe has run out of time, fuel and money but in a final attempt to solve some of the mysteries raised during its four year mission, the craft will be fired, using a technique known as airbraking, into a new, lower orbit inside the atmosphere of planet Venus

Magellan Venus orbiter

Launched 4 May 1989
from Shuttle Atlantis.
Began mapping Venus
15 September 1990

Star scanner

High-gain antenna used to scan planet and send signals back to Earth

Liquid fuel propulsion module

Rocket thruster motors

Thermal control louvres

Motors to aim solar panels

Solar panel

Area illuminated by radar beam

Radar beam from high-gain antenna maps one strip of Venus during each orbit. Multiple radar sweeps produce mosaic panoramas

Altimeter antenna measures time it takes radar pulses to return to spacecraft to calculate surface topography

Venus: Earth's inhospitable twin
Diameter: 12,100km – Earth's 12,756km.
Atmosphere: carbon dioxide with clouds of sulphuric acid. Atmospheric pressure 90 times that of earth.
Surface temperature: 475°C – hot enough to melt lead

Current orbit reaches 2,100km over north pole and 2,800km over south pole

Airbraking will reduce new orbit to between 200km and 600km

Venus rotates in opposite direction to other planets in solar system

Magellan's final experiment

① Radio command from Jet Propulsion Laboratory in California instructs Magellan to use remaining fuel for 10 minute burn to slow spacecraft down

② Slowing craft dips into upper atmosphere which acts as airbrake, reducing each orbit by about 10km

③ Low orbit will enable measurement of magnetic fields below planet's surface