Roland Piquepaille's Technology Trends

How new technologies are modifying our way of life

mercredi 11 février 2004

'Fly the Unfriendly Skies' of Mars... in a Robotic Balloon

A Californian company, **Global Aerospace Corporation** (GAR), is developing remote-controlled balloons for the **NASA Institute for Advanced Concepts** (NIAC). BBC News Online reports in **this article** that their goal is to send these balloons carrying robots and cameras to explore Mars skies. But it's not for a near term future.

> Nasa-funded researchers are developing the StratoSail, a balloon with a wing, that can be accurately steered through Mars' winds for months.
>
> Like weather balloons, the StratoSail could carry cameras and gadgets to spot potential areas for human missions.
>
> **The hi-tech devices could also launch robotic probes to monitor the surface**. [And,] when required, they could launch swarms of baby robot probes and mini-laboratories to carry out experiments.

Previous projects already attempted to send balloons over Venus, as SPACE.com reports in this story in November 2002, "**Robotic Balloon Probe Could Pierce Venus's Deadly Clouds**." But researchers soon realized that it was hard to stabilize these balloons especially because of the strong winds around Venus.

> The robotic StratoSail overcomes this problem by having a lightweight, stabilising wing suspended several miles below it.
>
> The wind force that is generated, because of the distance between the balloon and the wing, propels the whole device at speeds of one metre per second, explains Dr Alexey Pankine, project scientist at the Global Aerospace Corporation.

This is what they called the **StratoSail Balloon Trajectory Control System** (TCS).

Below are two images showing how this big wing looks like.

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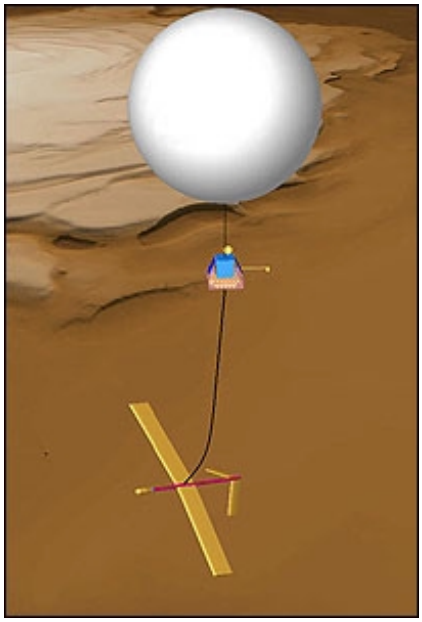
StratoSail TCS drawing (Credit: GAR)



StratoSail over Mars (Credit: NASA)

Here are some details about the TCS.

> The Trajectory Control System consists of several elements which work together to alter the trajectory (flight path) of the balloon system. We use the term TCS to refer to the entire system including hardware and software, equipment that flies with the balloon, equipment that remains on the ground (computers for example), and the personnel required to operate the equipment.
>
> The flight segment of the trajectory control system (TCS) is all the hardware and software that flies with the balloon. The flight segment consists of a TCS wing assembly (TWA), a tether, and a TCS interface package (TIP), as well as software that is loaded on computers in the TIP and TWA.

Please note that this is still a work in progress: no date has been set for deployment.

Source: BBC News Online, February 11, 2004; and various other websites

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Last update: 12/02/2004; 14:56:44.