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For Immediate Release

**SPACEQUEST DEVELOPS AVIONICS EQUIPMENT FOR
BIGELOW AEROSPACE GENESIS-I PATHFINDER**

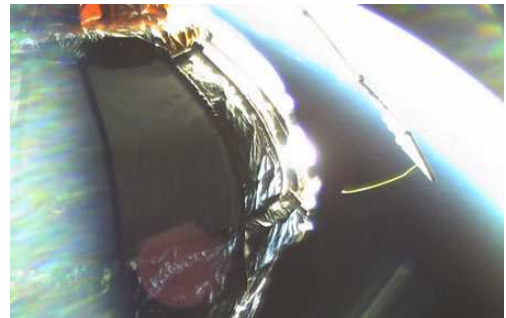
Fairfax, Virginia, August 4, 2006

Realizing a Dream

Since March of 2004, SpaceQuest has been working closely with Bigelow Aerospace toward achieving Robert Bigelow's dream of building the world's first private sector space station. One year later, work began in earnest to define requirements and mission priorities for the first expandable spacecraft, the Genesis-I Pathfinder. Within a few months, SpaceQuest engineers were exhaustively testing the new hardware that would make such an ambitious project both successful and economically viable. In May of 2006, a mere 13 months after work began, the completed Genesis-I was transported to its launch location in Yasnny, Russia. On 12 July 2006, the Dnepr launch vehicle lifted the Genesis-I spacecraft into commercial space history.

Paper to Orbit in 15 Months

CEO Dr. Dino Lorenzini and VP Mark Kanawati took a risk in deciding to largely abandon the traditional centralized architecture of many small spacecraft. Instead, they gave the green light to SpaceQuest's experienced engineers to develop a CAN-based spacecraft bus. The move involved eliminating tens of kilograms of potential harness wiring, instead replacing it with a light cable based on a new SpaceQuest standard interface specification called SIF. Given the short mission timeline, there was no room for error - the move to a CAN bus would either pay off or fail.



However, the ambition of the Genesis-I mission required a spacecraft an order of magnitude larger than anything SpaceQuest had ever attempted and the benefits of a CAN bus outweighed the risks of an all-new design. With the delivery of the first hardware unit, the General Purpose Terminal (GPT)¹, it was

¹ See the SpaceQuest website for more information about the General Purpose Terminal (GPT) and other space-qualified CAN compliant avionics.

clear that the risk had paid off - the benefits of a CAN bus sped development and allowed a level of flexibility unheard of in spacecraft design.

Nearly every component of the Genesis-I bus is a CAN-compliant device, developed by SpaceQuest. Each has at least one on-board processor, making the Genesis-I spacecraft a network of smaller computers, each looking after itself and its assigned functions. From the dual Battery Control Regulators (BCR) and GPTs used for collecting telemetry and controlling other powered devices and experiments, down to individual Sun-Sensors, every CAN-compliant device onboard is networked together by the SIF cables which ferry both power and data between all the nodes. The CAN bus utilizes a Ring topology to minimize excess cables, while providing a fault-tolerant bus geometry adding a physical layer of protection on top of the individually fault-tolerant CAN-compliant devices.

In addition to the CAN bus used to tie the entire spacecraft together telemetrically, an Ethernet bus was employed to supply high-speed communications between 13 digital cameras and switches developed by SpaceQuest to two custom-built high-performance computers, providing an Ethernet gateway to the Bigelow S-Band ground station in Las Vegas. Reston, VA-based SilkSpeed, Inc. provided consulting services on the Ethernet gateway, as well as software support for the advanced ground stations developed by SpaceQuest.



First Pass Anxiety

In contrast with the typical launch dynamic, SpaceQuest and Bigelow exceeded everyone's expectations and delivered the functional and ready-to-launch Genesis-I module to its Russian launch location on time for integration with its Dnepr ride to orbit. At approximately 9 pm local time in Yasny, the Dnepr made a flawless flight, placing the spacecraft into orbit, within 480 meters of the planned separation point.

Seven hours later, the SpaceQuest team in Fairfax, Virginia prepared for the very first satellite pass over its ground station. The Bigelow Team waited anxiously from their Las Vegas Mission Control room, with SpaceQuest CEO Dr. Dino Lorenzini coaching the team through their first spacecraft commissioning. The SpaceQuest Internet node-based antenna control system would allow any of the teams to assume control of either of the two ground stations available in support of the mission, should anything go wrong with the primary team. Everyone was in suspense, launch had occurred seven hours ago and this would be the first opportunity to learn the fate of the mission. Ironically, during those hours

waiting for the spacecraft to make a pass over the first ground station, most of the mission goals would execute automatically – waiting is always the hardest part.



As if to test the resolve of those who had already worked so hard to make this mission succeed, fate had one more surprise in store for the SpaceQuest team in Virginia. An electrical storm knocked out the power in the SpaceQuest facility. SpaceQuest engineer Glenn Richardson made excellent use of his available battery back-up units, removing all non-essential loads to conserve power for the pass. Fifteen minutes before contact, fate smiled once again on the small company with big ambitions and they were able to restore power to

the ground station equipment. However, there was not enough time to load the latest satellite orbital parameters into the tracking computer, so VP Mark Kanawati guided the antenna manually. Despite a very low elevation pass, Glenn Richardson was ecstatic to receive an acknowledgement from the spacecraft just as it cleared the horizon. It was difficult for the SpaceQuest engineers to believe that they actually made contact with Genesis-I so quickly, so they sent another status request to the spacecraft which was immediately acknowledged.

On that first 6 minute pass, SpaceQuest was able to download some vital telemetry, verifying the spacecraft's health and a directory of on-board files. From these clues, it was clear – Genesis-I was a resounding success! The station had deployed all 8 solar panels, the battery was charging from the surplus power provided by those arrays and the station had pressurized! All the while, the Virginia team was in contact with Dr. Lorenzini at Mission Control in Las Vegas, who relayed every event and the final result to the Bigelow team, who eagerly awaited the news.



Approximately ninety minutes later, Genesis-I made its second pass over SpaceQuest's facility in Fairfax, VA. This time, the pass was much higher in the sky and a bit longer. This pass garnered a few thumbnail images from the external cameras, documenting the solar panel deployment and pressurization of the expandable spacecraft. Needless to say, tears of joy flowed unabashedly from all sides when years of work and a dream finally realized manifested itself on the massive screen in Bigelow's Mission Control.

Commercial Space – Cooperation is the Key



SpaceQuest and Bigelow are two very different companies, both in scale and specialty, but one thing they both share equally is a healthy imagination. Without Mr. Bigelow's willingness to follow his dream of enabling commercial spaceflight – a willingness that extended into his own pocket and none of the American taxpayer's – the concept of expandable habitats would almost certainly still be just another figure in spacecraft design textbooks and attractions at a Disney EPCOT display. Bigelow's team of engineers brought this technology from concept to reality. SpaceQuest brought its years of experience with small satellites and low-cost space electronics to bear to make the dream affordable. Together, we succeeded where alone we could not. That's the power of commercial space. That's where we're going, here at SpaceQuest and Bigelow Aerospace as well.

This is Just the Beginning

There is no doubt, this is just the beginning. Even before the first SpaceQuest component was integrated into Bigelow's Genesis-I structure, Genesis-II's components were being developed in tandem with their identical Genesis-I sister. This process ensured that principles and practices developed for Genesis-I were identical in Genesis-II and could be modified if needed, based on the results of the first mission. Genesis-II and other future spacecraft will benefit greatly from the invaluable lessons learned with Genesis-I.



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About SpaceQuest, Ltd. (www.spacequest.com)

SpaceQuest has been a developer of advanced satellite technology for government, university and commercial companies for more than a decade, specializing in the design, construction, test and manufacture of spacecraft as well as space and ground components for operation with low-earth orbiting satellites.

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About Bigelow Aerospace (www.bigelow-aerospace.com)

Bigelow Aerospace is an entrepreneurial space development company headquartered in Las Vegas, Nevada. Bigelow Aerospace's goal is to open the frontier of space to all of humanity by drastically reducing the costs and enhancing the efficacy and utility of space-based activities. The company's primary focus is on the development of robust, next-generation expandable space habitats. Bigelow Aerospace has manufacturing facilities and offices in Las Vegas, North Las Vegas, Houston, and Maryland.

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