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FUTURE AVIONICS for X2K

"The Deep Space Systems Technology Program (known as the X2000 Program) was created by NASA and JPL in order to provide the technological breakthroughs that will enable NASA's faster-better-cheaper deep space science missions of the future."

The JPL X2000 program is for the delivery of advanced avionics systems, cutting edge technologies, and avionics components to spacecraft/orbiter, micro/nano-spacecraft, and in-situ missions. The objective is to develop and deliver avionics systems that will serve a multitude of future missions over the next 12 to 15 years.

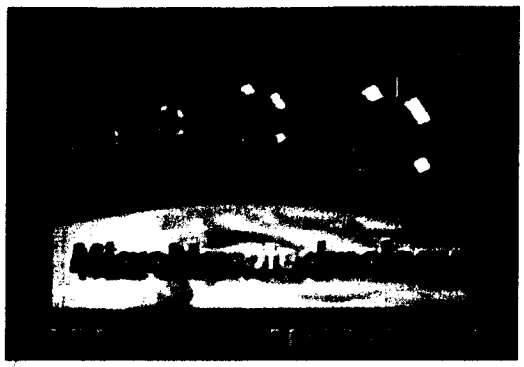
The avionics system includes all the necessary elements to operate a spacecraft: Power Subsystem, Command and Data Handling, and Attitude Control.

The X2000 program is divided into three deliverables: The1st delivery for missions in the 2001 to 2003 time frame, 2nd delivery for missions in the 2003 to 2005 time frame and 3rd delivery (defined as a System On A Chip) in the 2006-2008 time frame.

Deliverables are based on the most advanced technologies that industry has to offer. Each delivery cycle is design to produce a meaningful technological evolvement. For example, the target for 1st to 2nd delivery growth in the Data Handling system is: A 10x improvement in volume, 20x improvement in mass, 2x improvement in power, and >10x improvement in signal/data is processing. The 3rd delivery is targeted as the System On A Chip (SOAC) with yet another leap in integration levels.

In the process of development and fabrication JPL will work with industrial, academic, scientific laboratories, and other NASA center partners. This is to take advantage of the most enabling technologies and processes while maintaining broad-based synergism to reduce cost.

This paper is to describe the avionics system and to show the planned progression of technology implementation.



CALL FOR PAPERS

Enabling Technologies for New Space Systems

11 - 15 April 1999

The DoubleTree Hotel, Pasadena, California

The goal of the conference is to stimulate a revolution in the development of low cost space systems by combining Micro/Nanotechnology (MNT), Micro-Electro-Mechanical-Systems (MEMS), and producible Application Specific Integrated Microinstruments (ASIMs). The conference will bring together international experts in these areas to explore point designs for space applications of actual technologies, hardware, software, and nanosatellite systems leading to new space architectures.

The Conference objectives are to:

- Disseminate information on innovative MEMS, micro-engineering concepts and approaches which reduce system cost, add new capabilities, improve producibility, performance, and reliability
- Identify mission and candidate space architectures, and enabling key technologies.
- Assess state-of-the-art and project technical directions to achieve workable nanosatellite constellations.

Papers are invited on the application of MEMS and microengineering to the major categories listed here. Additional topics will also be considered. Accepted papers will be organized into oral and poster sessions. Abstracts should be up to 300 words in length and contain title, authors' name(s), affiliation, address, telephone, facsimile, and e-mail address. It is the author's responsibility to obtain appropriate releases. The conference language is English.

ABSTRACT DUE DATE:
10 NOVEMBER 1998

Please submit abstracts to:
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Major categories

ASIMS: Applications-Specific-Integrated-Micro-instruments
- Instrument/sensor design
- Flexible multi-parameter sensor devices, ASIM assemblies
- Wide band in-situ wireless microsensors

Producibility:
- MNT materials
- Design for replicate production
- Packaging, manufacturing materials processing tools

Micro/Nanotechnology (MNT) for Space Subsystems
- Power
- Micropropulsion
- ADACS: attitude, determination, & control systems
- GN&C: guidance, navigation, & control
- C&DH: command & data handling
- Communications & signal processing
- Mission sensors
- Health monitoring, self test, & repair

Case Studies in Design, Development, Fabrication, & Operation of Integrated Space Microsystems

Nanosatellites Space Systems
- Requirements & architectures
- Enabling technologies & designs for producibility
- Communications, remote sensing, data relay
- Swarms, clusters, & distributed constellations
- Launch to orbit, launch on demand

Expert Panels

Producibility:
- Design
- Materials
- Manufacturing

Software

Low Power Electronics (including nano-electronics)
- For communications
- For data processing & memory
- For sensors

GN&C for nanosatellites

Micropropulsion for nanosatellites

Watch for futher details in

an upcoming program mailer

scheduled for October 1998.

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