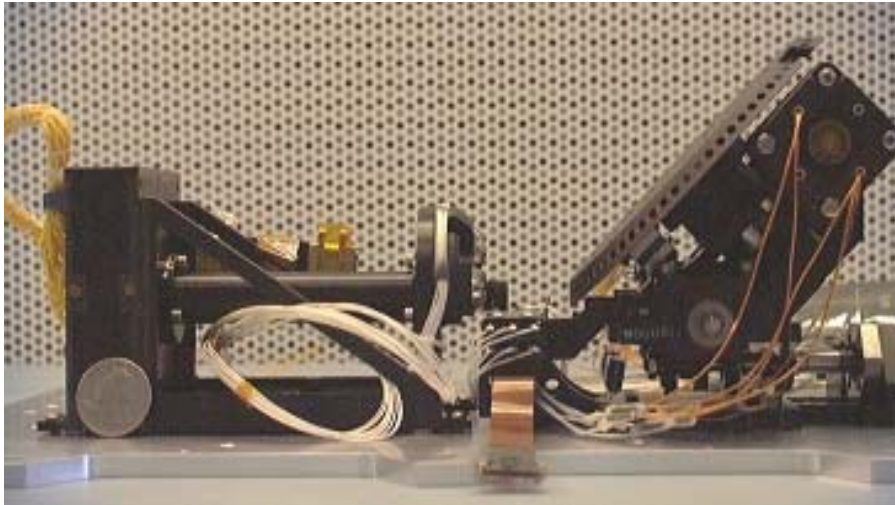


Scientific Interests

Something I always wanted to do was work on space related flight hardware. I got my chance when starting with Surface Interface. The MECA Sample Wheel / Translation Stage was originally slated for the Mars Surveyor 2001 Lander. But that spacecraft was canceled and the MECA Sample Wheel stored at JPL. Now in route to Mars on the Phoenix 2007 Lander it should land May 25, 2008. The MECA sample wheel is a disk capable of fine rotation and linear positioning. It carries 69 substrates that will allow for the viewing and measurement of dirt particles sampled from the Martian surface soil. The MECA Translation Stage positions the sample wheel so an Optical and Atomic Force Microscope (pictured on the left side) can access the substrates.



The electrical elements of the MECA SW / TS consisted of 2 ultra-high vacuum stepper motors having thermo-couples, at least 6 flight compatible limit switches, and 2 RTD probes. All of which connected to an ultra high density D-Sub connector. By vigorously exercising the assembly I was able to find intermittent missed steps. While temperature cycling using just cool spray was again able to find failures, this time including a limit switch that needed a fine positioning adjustment. There were a few late weekend nights, but the assemblies were delivered on time. Later we learned the flight had been canceled, but I held out hope having talked with a JPL person who said it might eventually fly. I carefully stored all the schematics, testing hardware, and software in a box I marked "MECA, Do Not Throw Away" for years. Surface Interface soon spun off its High Vacuum Manipulator products to a company named Transfer Engineering. Later Surface Interface was acquired by FEI Company who was interested in the Stylus NanoProfilometer product. During a move to a bigger building I again defend the MECA box. Later when Transfer Engineering became interested, I gave it to them and there have been recent follow up orders for the MECA SW / TS.

A few links for the MECA Sample Wheel / Translation Stage:

http://ron-selman.home.comcast.net/ScientificInterests/NASA_Phoenix_Mars_Lander.pdf

<http://planetary.chem.tufts.edu/Phoenix/MECA.html>

<http://phoenix.jpl.arizona.edu/mission.php>

http://phoenix.jpl.arizona.edu/science_meca.php

A few more general space related links:

<http://www.space.com>, <http://www.planetary.org>, <http://www.nss.org>