Community Input for Alternate Science Investigations for the Kepler Spacecraft:

Using the Kepler Spacecraft to scan the nearby Solar System for Near Earth Orbit Objects

While the Kepler Spacecraft is being stabilized by the remaining two momentum wheels a high power laser is scanned across the nearby solar system area within the gaze of the Kepler telescope. The laser could be an infra-red wavelength capable of passing through the atmosphere and be shone through a telescope optic (for example the 60 inch Hale telescope on Mt. Wilson in California) and scanned (using a piezoelectric actuator) across an area that the Kepler telescope was looking at. The Kepler telescope would then be able to use it's sensitive brightness change discriminating CCD array to detect an increase in brightness from the beam striking an asteroid or cometary debris object.

Appended to this description are two documents by other authors that are provided as a bibliography: "Laser Tracking of Space Debris" by Dr Ben Greene of EOS Technologies, Inc., Tucson, Az 85705, at the "13th International Workshop on Laser Ranging Instrumentation" in Washington, DC, on October 10, 2002; and "AS081Q15000W" from Roithner LaserTechnic of Vienna, Austria.

The "Laser Tracking of Space Debris" paper describes the capabilities of the technology in 2008 in the opinion of by Dr Ben Greene of EOS Technologies, Inc., Tucson, AZ. The available technology for 2002 is described starting at page 10.

The AS081Q15000W document describes a 15kW optical power output Infra-red Laser diode array.

Given the electrical to photonic conversion efficiency is 40%, the electrical power supply's output requirement would be 37.5 kW and assuming 80% electrical efficiency, roughly 50 kW electrical input power. Some cooling power would also be required, say a Freon compressor, 50% efficient, dissipating 22.5kW for 45 kW electrical output and 57 kW electrical input for a total of 107 kW electrical.

$40k for the diode array, $10k for the array collimating optics, A/C Condenser $10k, Electronic power.

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