a means with which to monitor the relative alignment over time.

This innovation does not require extremely good thermal stability on the primary mirror and can thus be used in any thermal environment and with cheaper materials. This factor could be critical in enabling the construction of very large telescopes, and provides a means for testing a very large telescope as it is being assembled. In addition to this, the architecture lets one phase (or align) the primary mirror independent of whether a star or scene is in the field. The segmented, spherical primary allows for cost-effective three-meter class (e.g. Midex and Discovery) missions as well as enabling 30-meter telescope solutions that can be manufactured in a reasonable amount of time. The continuous wavefront sensing and control architecture enables missions for low-Earth-orbit.

This work was done by Lee Feinberg, John Hagopian, Bruce Dean, and Joe Howard for Goddard Space Flight Center. Further information is contained in a TSP (see page 1). GSC-14982-1

Micro-Resistojet for Small Satellites

Goddard Space Flight Center, Greenbelt, Maryland

An efficient micro-resistojet has been developed with thrust in the millinewton level, with a specific impulse of approximately 250 seconds and power input of 20 watts or less that is useful for applications of up to 1,000 hours of operation or more. The essential feature of this invention is a gas-carrying tube surrounding a central heating element. The propellant is flashed into vapor and then passes through a narrow annulus between the tube and the heater where it is cracked (in the case of methanol, into CO and H_2) before being discharged through a de Laval nozzle to produce thrust.

A multi-layer radiation shield around the gas tube minimizes heat loss. Also, if methanol is used as the propellant, the simultaneous heating and cracking does not need an additional device. This unit would be especially useful for small satellites, with mass up to 100 kg, and for delta v up to 500 m/sec, and is suited for use with "green" methanol as the propellant where a specific impulse of 220 seconds is expected. Noble metal alloys are the optimal materials of construction. While the microresistojet is especially suited to methanol, many other propellants may be used such as water or, in the case of de-orbiting, many other residual liquids onboard the vehicle.

This work was done by Thomas Brogan, Mike Robin, Mary Delichatsios, John Duggan, Kurt Hohman, and Vlad Hruby of Busek Co. Inc. for Goddard Space Flight Center. For further information, contact the Goddard Innovative Partnerships Office at (301) 286-5810. GSC-15053-1

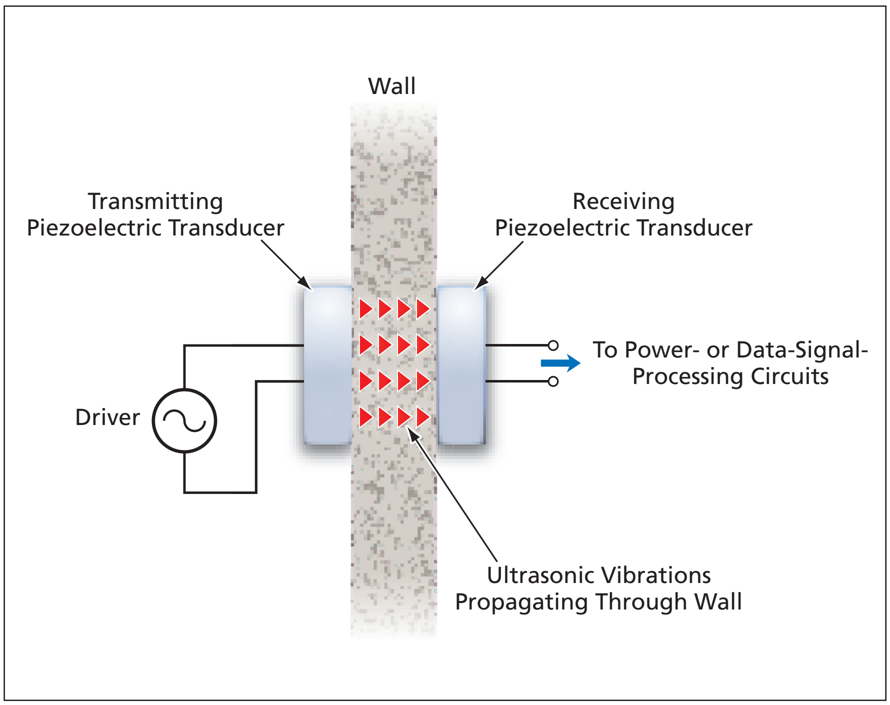
Using Piezoelectric Devices To Transmit Power Through Walls

It would not be necessary to make holes in walls for wires.

NASA's Jet Propulsion Laboratory, Pasadena, California

A method denoted wireless acoustic-electric feed-through (WAEF) has been conceived for transmitting power and/or data signals through walls or other solid objects made of a variety of elastic materials that could be electrically conductive or nonconductive. WAEF would make it unnecessary to use wires, optical fibers, tubes, or other discrete wall-penetrating signal-transmitting components, thereby eliminating the potential for structural weakening or leakage at such penetrations. Avoidance of such penetrations could be essential in some applications in which maintenance of pressure, vacuum, or chemical or biological isolation is required.

In a basic WAEF setup (see figure), a transmitting piezoelectric transducer on one side of a wall would be driven at resonance to excite ultrasonic vibrations in the wall. A receiving piezoelectric transducer on the opposite side of the wall would convert the vibrations back to an ultrasonic AC electric signal, which would then be detected and otherwise



Ultrasonic Waves would be used to transmit a power or data signal through a wall.