A Motionless Camera

Originally developed as a viewing device for guiding space robots, the Omniview camera (on tripod) can photograph up to four objects simultaneously without moving its lens; the rotating, panning and tilting functions are handled electronically.

Omniview™ is a camera system, a very different camera system. It can see in more than one direction and provide as many as four views simultaneously, each with its own pan, tilt, rotation and magnification. And for all that it has no moving parts.

Developed by TeleRobotics International, Inc. (TRI), Knoxville, Tennessee under a NASA Small Business Innovation Research contract, Omniview was introduced to the commercial market in 1993 and in the same year it won an R&D 100 Award, presented by R&D Magazine as one of the most technologically significant products of the year.

The camera was intended primarily for NASA use as a viewer for space tele-operation of robotic systems, where size, weight and power consumption are at a premium, and reliability and fast response are among the most important factors. Therefore, Omniview was developed to eliminate the pointing mechanisms and mechanical links normally required for rotating, panning and tilting the camera; all these functions are handled electronically. The result is a motionless, noiseless, exceptionally versatile camera whose capabilities can be advantageously employed in a broad variety of applications.

Omniview's image transformation electronics produce a real-time image from anywhere within a hemispherical field, such as the circular image provided by a fisheye lens with a 180 degree field of view. A video image viewed through a fisheye lens would be distorted, but Omniview automatically removes any lens distortion from the image and presents a corrected "flat" view on a monitor.

Among the key elements of the system are a high resolution CCD (charge coupled device); image correction circuitry governed by two TeleRobotics develop-
Surveillance of an apartment building lobby is one of many Omniview applications. A video image viewed through a wide angle fisheye lens would be badly distorted as shown at left, but Omniview removes the distortion and presents a corrected "flat" view on the monitor; note the distortion of the staircase in the fisheye view and the corrected closeup below.

Omniview is a trademark of TeleRobotics International, Inc.