OPEN VIRTUAL REALITY TESTBED

Applying Virtual Environments to Manufacturing

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When we first announced this hearing the Commerce Committee office got dozens of telephone calls from people asking what is "virtual reality" and why are you holding a hearing on it? Well, the answer is fairly simple. Virtual reality promises to revolutionize the way we use computers. At least that's my opinion. It could improve the way we design new products, how we teach our children, and how we spend our free time. It has the potential to change our lives in dozens of ways.

Albert Gore opening statement at May 1991 Committee on Commerce, Science and Transportation United States Senate Hearing.

1.0 Virtual Environments - Some Background

Virtual environments (VE), alternately known as virtual reality (VR), synthetic environments and other names, are a collection of technologies which, offers the opportunity to integrate the human into a computing system. The technologies which are used to create a virtual environment are: a high speed graphics display computer, a head mounted display, a 3D position tracker/input device, and spatial audio. When combined into a single system the computer application can track a user's head position and generate a display that changes depending on where the user is looking. The 3D input device allows the user to interact with synthetic objects and the spatial audio heightens a user's sense of place.

For example a user could interact with a virtual lathe. The lathe, actually a computer graphics image, spins on the display screen and the user moves a virtual cutter with a

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