MACHINE DESIGN

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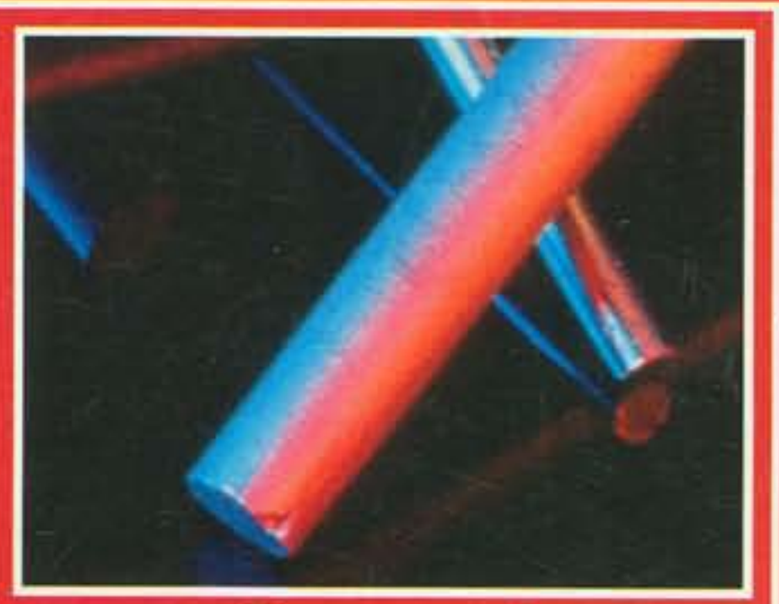
Weather Radar

Design Show



Compact Actuators

CUTTING CIRCUIT BOARDS DOWN TO SIZE

Robotic excavator could play key role in waste cleanup

The hazardous job of cleaning up radioactive and chemical waste may soon be the responsibility of a remotely operated excavator dubbed Haz-Trak. Unlike conventional excavators, Haz-Trak features a boom that is maneuvered by a single hand controller shaped similar to a pistol grip instead of multiple levers or joysticks. Because the boom follows simple hand and arm motions, it is much simpler to operate. Lever controls, in contrast, require considerable practice on the part of an operator before boom and bucket can be moved deftly.

The bucket at the end of a boom can be replaced by a gripper to transform the vehicle into a materials-handling system. This setup includes feedback that lets operators feel how much force is being applied at the gripper. Thus, they can easily handle 55-gallon waste drums as well as smaller objects.

Haz-Trak excavator was developed with the Department of Energy and hazardous-waste cleanup in mind.

Haz-Trak is made by Kraft Telerobotics of Overland Park, Kansas. It is the first application of the hand controller and force feedback on an excavator.

"The Department of Energy is interested in the excavator because it believes the vehicle would be useful for hazardous-waste cleanup," says Steve Harbur, director of product development at Kraft. "We believe that the vehicle opens up the design path for machines of the future. With the hand controller, for example, operators can be trained to control the bucket and boom in a matter of hours. Conventional excavator controls require operators to train for months."

The hand controller also makes it possible to add bucket yaw and roll. With control levers, operators would be overwhelmed by the extra functions, according to Harbur. ■