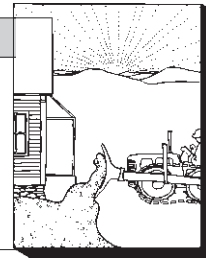


Meet the Moose, Odex I, and Studbot

by John D. Wagner

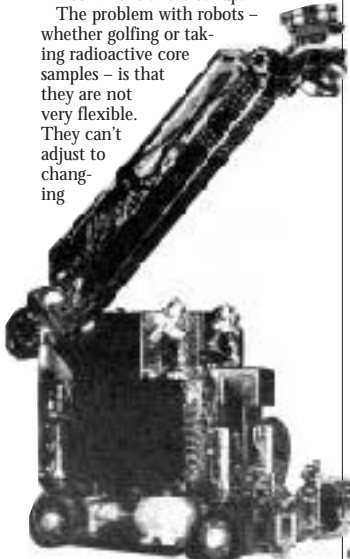


And then there's the joke about the golfer who buys a golfing robot because it is guaranteed to hit a 350-yard drive every time. This odd two-some hustles up a match on the first tee and bets \$50 a stroke on the round.

Sure enough the robot tees up and hits a laser-beam shot 350 yards, 2 inches from the lip of the cup. Soon it's the robot's turn to putt. He steps up, addresses the ball for a certain double eagle, and sure enough, he hits another laser-beam shot...350 yards. Expensive mistake.

Today, robots are wheeling, climbing, and clawing their way into specialized niches in the construction industry. Now, they may not be as dumb as the golfing robot, nor as intuitive as the robot on the old TV program "Lost in Space," but they are starting to take on tasks that would be hazardous for humans. (No they don't bid remodeling jobs.) In fact, the nuclear rehab industry expects to employ as many as six robots in the Three Mile Island cleanup.

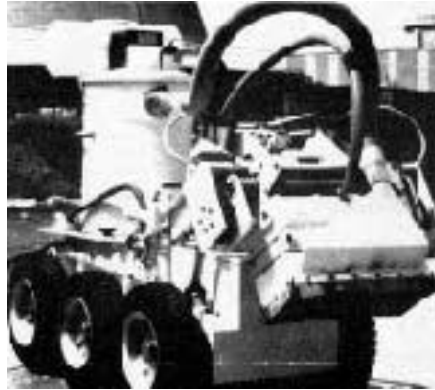
The problem with robots – whether golfing or taking radioactive core samples – is that they are not very flexible. They can't adjust to changing



The Robotic Institute of Carnegie Mellon University has developed the "RWV," or Remote Work Vehicle. It is a "mobile, teleoperated, electrohydraulic system designed for aggressive...work." It is already at work on Three Mile Island.

conditions the way humans can. They have trouble getting around, sensing depth, or adjusting to the changing nature of the task at hand.

Research is under way to change all that. By most accounts, practical American-made robots for light-commercial construction application are still ten to fifteen years away. But there are quite a few reputable inventors in the field working on prototypes. For instance, Alex Slocum, from Massachusetts Institute of Technology, is working on prototypes for



Breaking up concrete is kid's stuff for this beast, called "the Moose," which can deliver up to 1,200 hammer blows per minute. It was designed by Pentek Inc., Coaopolis, Pa.

Studbot, Wallbot, and Blockbot.

These computer-controlled units will be able to lay metal sill tracks for interior partition framing, put up wall panels, and lay concrete blocks. MIT is also at work on a robotics scaffolding system, but the details on that project are still vague.

"Japan is way ahead of us in this game," says Paul Teicholz, director of the Center for Integrated Facility Engineering, at Stamford University, "and they are spending millions of dollars" developing robots. Companies like Tisei and Shimizu Construction Company have developed robots to do such tasks as spraying insulation and loading and handling materials.

Not to be outdone, Carnegie Mellon Robotics Institute, in Pittsburgh, Pa., is developing a number of robots for standard construction work. They have one robot that does excavation work, a particularly dangerous chore when you're working around leaky gas pipes. Carnegie Mellon also has an operation robot called the "RWV," or Remote Work Vehicle (see photo), which is a "mobile, teleoperated, electrohydraulic system designed for aggressive...work." It is already at work cleaning up the mess at Three Mile Island. Yet another Carnegie Mellon robot being developed is "REX," a robotics excavator that can



"Kluge" was developed by Cybermation Inc., in Roanoke, Va. It is a radio-controlled, three-wheeled machine that can navigate tight passageways.



The "MF3," made in West Germany, is a radio-controlled vehicle that carries a small television camera to assist its operator; it is about the size of a small car.

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Needless to say, a car-sized helper around the job site might get in the way. Well, in that case there is "Kluge" (see photo), developed by Cybermation Inc., in Roanoke, Va. Kluge is a radio-controlled, three-wheeled machine that can navigate tight passageways.

A little more practical for construction is "The Moose" (see photo). Breaking up concrete is kid's stuff for this beast. "The Moose" can deliver up to 1,200 hammer blows per minute. It was designed by Pentek Inc., Coaopolis, Pa.

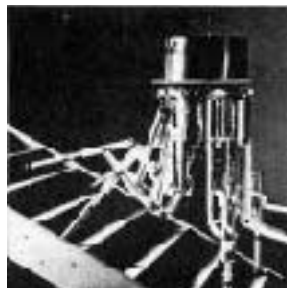
But don't expect your laborers to be replaced by cyborgs any time soon. For the foreseeable future, the construction will employ robots in a very limited way, probably only in factories where prefabricated components for housing can be assembled under controllable conditions. In fact, the factory-built-

You may be an old-fashioned kind of person who wouldn't want robots on your job site even if they do become available, right? Sure... and that's what you said about portable computers, cellular phones, and laser levels, too.

be used to unearth utility pipelines.

Also pictured on this page is the "Odex I," a walking robot designed by the Savannah River Laboratory. It can lift 300 pounds and step as high as 30 inches. Its manipulator arm can extend 6 feet. Though it has few practical applications in everyday construction work, it is being used for maintenance. Another mobile unit is the "MF3," (see photo) made in West Germany. This robot is radio-controlled and carries a small television

housing industry already employees sophisticated panelizing machines that are – by some definitions – robots. Right now though, prohibitive costs and inflexibility are the two major stumbling blocks for construction robots. Besides, you may be an old-fashioned kind of person who wouldn't want robots on your job site even if they do become available, right! Sure...and that's what you said about portable computers, cellular phones, and laser levels, too. ■



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