



Fingers With Force

ENGINEERS AT THE UNIVERSITY OF WASHINGTON AND Stanford University have developed a bed of tiny fingers made of silicon and polymer that can push objects around. "Each actuator is very simple," says Karl Böhringer, the University of Washington professor of electrical engineering who led the effort, "but together they can move objects much larger than themselves."

Böhringer and his colleagues were trying to devise the best way to dock tiny satellites at a space station. NASA is betting that swarms of coffee-cup-size satellites will be able to perform mundane service func-

tions more efficiently than space-suited astronauts. However, they'd need frequent refueling, and that would require a docking system that is small and lightweight.

Böhringer already had the solution: "I'd been working on a way to move

sheets of paper through a copying machine with a very thin mechanism." His concept was a paper feeder employing tiny fingers of silicon. In frictionless space, Böhringer realized, small satellites would be as easy to push around as paper. So he and his colleagues fabricated patches of fingers, each less than half an inch long, and threaded them together with tungsten wires. When the wires are charged with electric current, the normally curled fingers straighten out; straightened and curled in the right order, the fingers can maneuver a lightweight object into any position.

Böhringer's silicon fingers could even have earthly applications. He imagines that such fingers could be put to work positioning minute objects, such as samples under a microscope.

—Jeffrey Winters