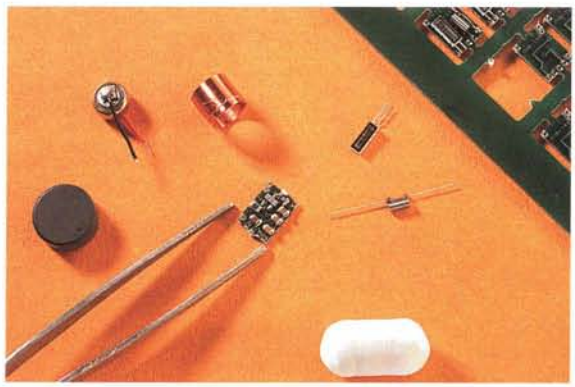
Heat Stress Monitor

In the U.S. there are some 8,000 members of hazardous materials (HAZMAT) response teams who must frequently wear full body protection suits. There are many thousands of others, such as firefighters, divers and nuclear facility technicians, who must wear similar protective gear. The equipment is heavy and cumbersome, and it causes marked elevation of body temperatures, which at best reduces the effectiveness of the worker and at worst can lead to heat stress and serious injury.

Human Technologies, Inc. (HTI), St. Petersburg, Florida, saw a need for a means of measuring body core temperatures of people subjected to heat stress environments and providing a warning to the wearer of protective gear and his/her command post. The company manufactures a spinoff system known as CorTemp — developed by Johns Hopkins Applied Physics Laboratory for NASA physiological monitoring — that is already in wide use in medical applications; HTI felt that, with modification and refinement, CorTemp could provide the basis for a body temperature monitoring/alarm system.

In 1993, HTI launched a HAZMAT Stress Alert Program to test the CorTemp System in actual heat stress environments and acquire data on what further development is needed to make it a fully effective safety and communications tool. The program kicked off with a series of tests conducted by the St. Petersburg Fire Department,



which is part of the Pinellas County Hazardous Materials Response Team.

The CorTemp System, encased in a three-quarter-inch ingestible capsule, includes a mini-thermometer, a miniature telemetry system, a microbattery and a temperature sensor; the capsule (white) is shown **above** with its tiny components. Taken as a pill, the capsule makes its way through the digestive system, continuously monitoring body temperature by means of the crystal quartz sensor. **Below,** a member of the St. Petersburg Fire Department is being helped into his HAZMAT gear; the CorTemp recorder is visible on his belt.

Through 1993, HTI had sold some 200 CorTemp systems to medical institutions, commercial firms and military services throughout the world; the system enjoyed a 100 percent success rate in some 12,000 ingestions.

In addition to the St. Petersburg HAZMAT tests, nine other HTI customers are using the CorTemp System for heat stress analysis and warning. Seven other organizations are investigating the potential of the system.