

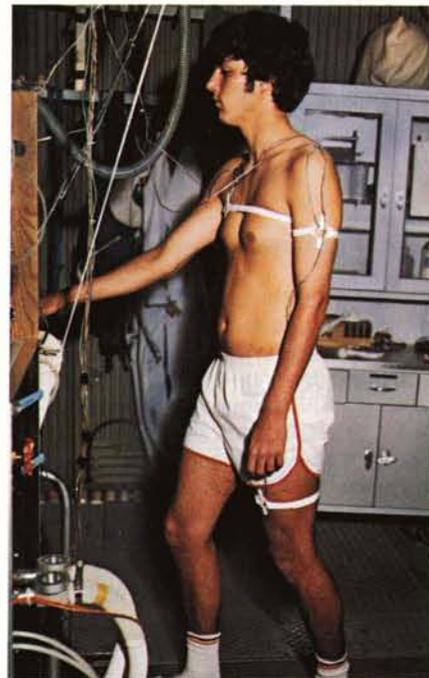
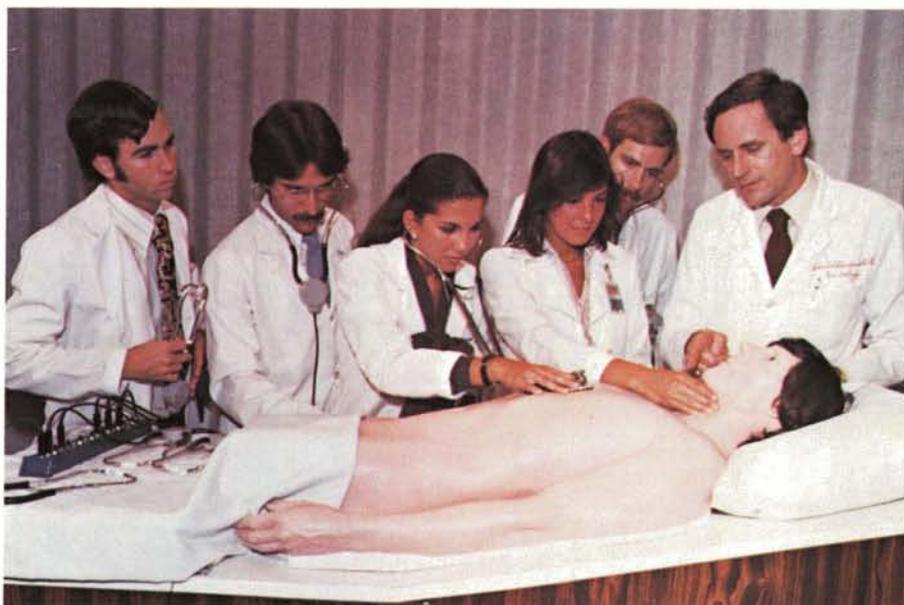
### Cardiology Mannequin

Education of medical students in cardiology requires access to patients having a variety of different forms of heart disease. But bringing together student, instructor and patient is a difficult and expensive process that does not benefit the patient. An alternate approach is substitution of a lifelike mannequin capable of simulating many conditions of heart disease. The mannequin pictured below, together with a related information display, is an advanced medical training system whose development benefited from NASA visual display technology and consultative input from NASA's Kennedy Space Center.

The mannequin system represents more than 10 years of development effort by Dr. Michael S. Gordon, professor of cardiology at the University of Miami (Florida) School of Medicine. Dr. Gordon was assisted by colleagues at the medical school, by the New York firm of Messmore & Damon which builds the mannequins, and by NASA's Biomedical Applications Team, Research Triangle Insti-

tute, North Carolina. The latter group searched available NASA literature for technology useful to the development. It was able to identify applicable studies of visual information display techniques performed at Kennedy Space Center; these techniques were subsequently incorporated into the mannequin system.

The electronic mannequin simulates 40 heart disease conditions with a high degree of realism, for example, chest movement, pressure in artificial veins and arteries, and sounds of heartbeat rhythms. On the accompanying display unit, the instructor or student can push buttons to call up such information as patient histories, electrocardiograms, x-rays, blood circulation data and responses to medical and surgical treatments. The mannequin has proved a valuable educational aid at the University of Miami, Duke University Medical School, Yale University Medical School and the American College of Cardiology. The system is being produced commercially by Messmore & Damon.



### Temperature Measurement Aid

NASA's Ames Research Center has designed a simple but medically-important device—one which holds temperature probes, called thermistors, to a person's skin without affecting the characteristics of the skin segment being measured. The device improves the accuracy of skin surface temperature measurements, valuable data in health evaluation.

The need for such a device was recognized in the course of life science experiments at Ames. In earlier methods, the sensing head of the temperature probe was affixed to the patient's skin by tape or elastic bands. This created a heat variance which altered skin temperature readings.

The Ames-developed thermistor holder is a plastic ring with tab extensions, shown in the upper photo on the chest, arm and leg of the patient undergoing examination. The ring holds the sensing head of the temperature probe and provides firm, constant pressure between the skin and the probe. The tabs help stabilize the ring and provide attachment points for the fastening tape or bands, which do not directly touch the sensor. With this new tool, it is possible to determine more accurately the physiological effects of strenuous exercise, particularly on the treadmill. The holder is commercially available from Yellow Springs Instrument Company, Inc., Yellow Springs, Ohio, which is producing the device under a NASA patent license.