

At left, is the Probeye® Model 3300 Thermal Video System, manufactured by Hughes Aircraft Company, a subsidiary of GM Hughes Electronics Company, Carlsbad, California. It consists of a tripod mounted infrared scanner that detects the degree of heat emitted by an object and a TV monitor on which the results are displayed. The latest addition to Hughes' line of infrared imaging systems intended for medical applications, it can detect temperature variations as fine as one-tenth of a degree Centigrade.

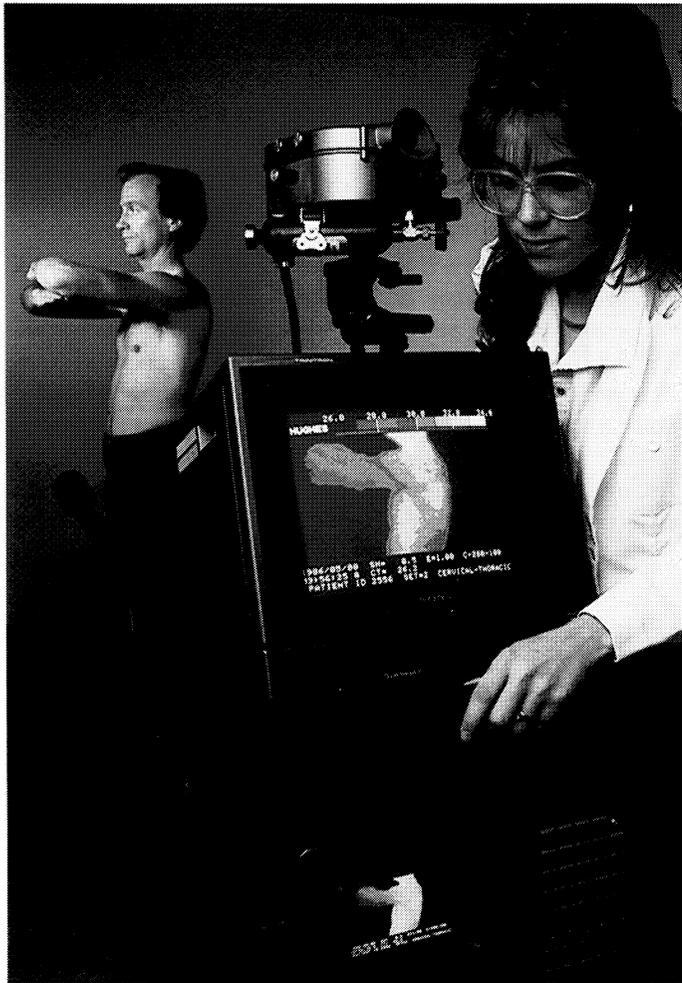
The thermographic image (left) exemplifies its utility as a medical system. This image tells an analyst that the first two fingers of the right hand emit less heat at the skin surface, thereby indicating subnormal blood circulation.

Medical thermography is rapidly gaining acceptance in health care as a noninvasive means of observing physiological problems. Where the x-ray, for example, provides indications of structural anomalies, thermography can point out functional anomalies. For instance, a thermograph showing an asymmetrical temperature pattern in the body surface serves as a visual indicator that pain exists. Mapping of dermatomes (areas of skin supplied by a specific spinal nerve) makes

possible accurate measurement of nerve dysfunction; sensory nerve impairment in the lower back can be evidenced by a temperature difference, from one extremity to the other, of only one degree Centigrade. At right, a patient is undergoing a nerve function test, assuming a stance so the thermal imaging scanner can sense heat differences.

Thermography is proving to be a valuable screening tool in diagnosis; thermal imaging can provide information to preclude the necessity of performing more invasive tests that might be painful or hazardous. Thermal imaging is also useful in verifying a patient's progress through therapy and rehabilitation, and it is finding special utility in sports medicine as a noninvasive means of determining the extent of injuries.

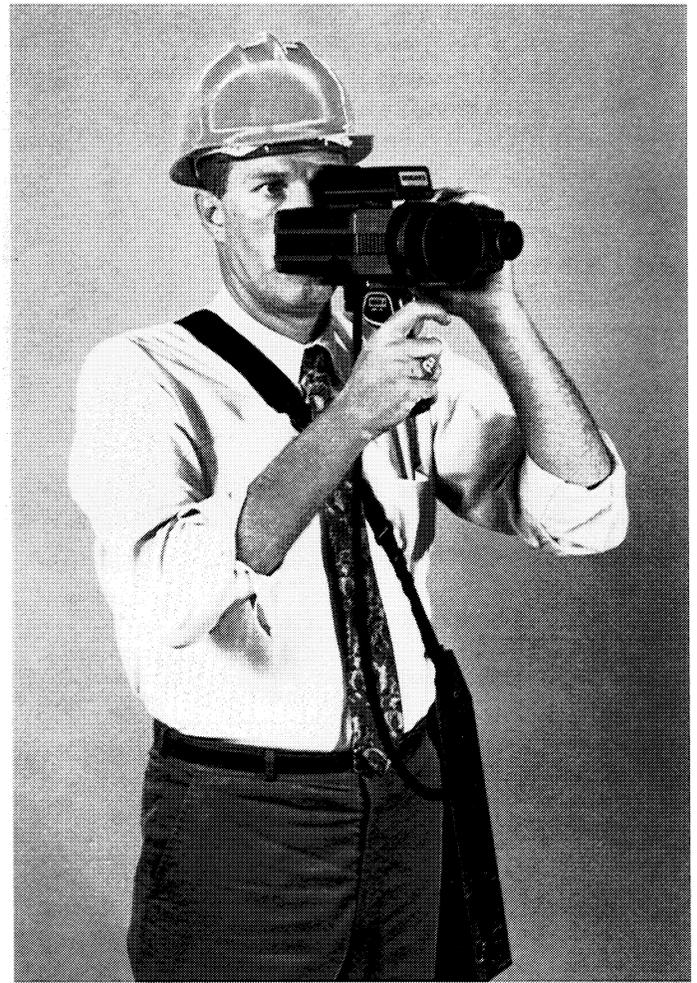
Hughes Aircraft pioneered development of heat sensing devices for military applications, such as missile guidance, under Department of Defense funding. NASA sponsored a demonstration project designed to explore the civil potential of thermal imaging under the Technol-



ogy Utilization Program.

Hughes initially focused on industrial applications of its Probeye Thermal Video Systems. More recently, company researchers were able to make the infrared detectors sensitive enough for medical thermography. Hughes now manufactures a wide range of Probeye systems and accessories, principally for such industrial uses as inspection

of electronic components, fire fighting, heat profiling for nondestructive quality testing, preventive maintenance, and routine monitoring of production processes and energy losses.



Shown above is one of the newer industrial systems, the portable Probeye Model 7100, which includes an infrared imager with an integrated viewfinder and an associated image processing unit carried on a shoulder strap. ▲

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