

**Infant Transport Monitoring** The photo sequence illustrates the movement of an ill infant to a special care hospital by means of a new Pediatric Monitoring and Transport System, in which NASA technology and technical assistance are being applied to an urgent medical problem. Development of the system is a collaborative effort involving several organizations, principally NASA Ames Research Center and Children's Hospital Medical Center, Oakland, California.

Key to the system's efficacy is a custom-designed ambulance-to-hospital and hospital-to-hospital communications network, including two-way voice capability and space-derived biotelemetry; it allows a specialist at the destination hospital to monitor continuously the vital signs of the patient during transit.

Premature babies and others who become ill soon after birth require intensive care and treatment most community hospitals cannot provide; they lack the specially-trained physicians and nurses and the expensive equipment needed. Movement of infants from outlying areas to intensive care nurseries such as Oakland's Children's Hospital Medical Center, which handles 50 critically ill newborns a month, may take hours by ground ambulance; even airplane and helicopter transport can be lengthy. Medical experts say that infants' survival frequently depends on efficient transport management and en route care.

With the Pediatric Monitoring and Transport System, the baby is under constant direct and remote supervision throughout the trip. The multifaceted system includes special preparations at the originating hospital; a new incubator (far right photo) specifically designed for this application; a specially-trained intern and nurse on the transport vehicle; a Telecare portable biotelemetry unit (red box in top photo), a spinoff from physiological monitoring of astronauts in space; an ambulance-mounted or airborne transmission system for voice or telemetry signals; microwave towers for relaying communications; and a Neonatal (newborn) Monitoring Base Station at Children's Hospital Medical Center (photo at right). The latter is staffed by a neonatal specialist physician, who has radio and telephone contact with the transport vehicle, the originating hospital, and the Alameda County Medical Communications Coordinating Center.

By means of specially-designed, non-invasive electrodes attached to the infant's body, vital data—for example, electrocardiogram, respiration and temperature—is sent continuously to Children's Hospital Medical Center.

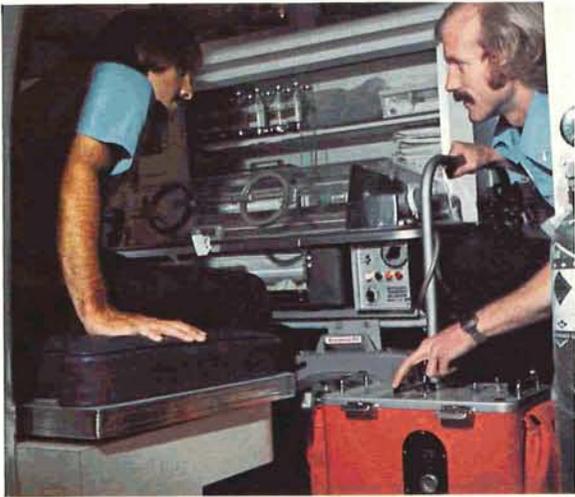
It is displayed on a console and also recorded on cassettes and a strip chart recorder. The system provides the monitoring neonatologist essential information for prescribing en route care measures or emergency treatment if the infant's condition worsens during transit. The monitoring process continues even after arrival at the hospital, during surgery or intensive care.

Ames Research Center is applying NASA-developed technology, particularly bioinstrumentation, and providing technical assistance in the evaluation of telemetry and other systems. Ames is being helped by Johnson Space Center, under whose supervision the Telecare unit was originally developed. In addition to Children's Hospital Medical Center, other participants include Telecare, Inc., Houston, Texas; Perinatal Systems, Inc., Tucson, Arizona, which contributed the equipment and installation expertise for



the central monitoring station; and the Bay Area Emergency Medical Services Council. Funding was provided by NASA, the Department of Health, Education and Welfare, and Alameda County.

The system went into operation late last year and it is planned to extend the service to other hospitals in northern California.



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