

HEALTH AND MEDICINE

Advanced Pacemaker

At right is Synchrony®, an advanced state-of-the-art implantable pacemaker that closely matches the natural rhythm of the heart. At right below is the companion element of the Synchrony Pacemaker System, the Programmer Analyzer APS-II, which allows a doctor to reprogram and fine tune the pacemaker to each user's special requirements without surgery.

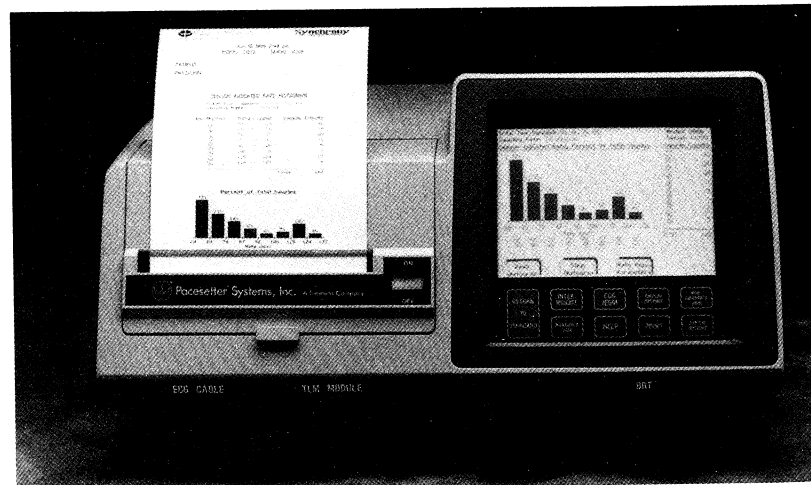
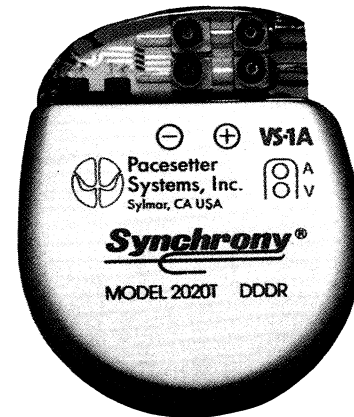
The Synchrony Pacemaker System, developed and produced by Siemens-Pacesetter, Inc., Sylmar, California, won Food and Drug Administration approval for general marketing in August 1989 after clinical trials involving more than 750 implants in more than 90 hospitals. The two-way communications capability that allows the physician to instruct and query the pacemaker is accomplished by means of the space technology known as bidirectional telemetry, which NASA developed for communication between Earth stations and orbiting satellites.

The people pictured, who span a wide age and activity spectrum, were among the first recipients. In the upper photo, opposite page, is Gary Norgan, 39, a Hemet, California life science teacher who enjoys backpacking, tennis and basketball; he became the first Synchrony recipient in the United States in March 1988. A July 1988 recipient is Deborah Rurik (right center), 33, vice president of a Columbus, Ohio real estate firm who participates in aerobics with her six-year-old daughter. Retired Bakersfield, California dentist Charles Linfesty (far right), 80, a December 1988 recipient is an avid fisherman who also does extensive walking and weight training.

These patients are able to pursue such activities because of Synchrony's dramatic technological advance: a rate-modulated, dual chamber device that synchronizes the upper and lower chambers of the heart. A uniquely designed activity sensor allows Synchrony to respond to body movement or activity; Synchrony then increases the heart rate, which boosts the supply of oxygen to the body. This feature opens up to pacemaker

patients a whole range of activities—jogging, dancing, swimming or other athletic pursuits—from which they were previously barred.

With the two-way communications capability, the doctor can adjust the device to best suit a patient's needs, which may change over time with changes in physical condition. He can send signals to the pacemaker to alter its rate, for example, and receive signals from the implanted device informing him of the status of its interaction with the heart. The Programmer Analyzer APS-II features 28 pacing functions and thousands of programming combinations to accommodate diverse lifestyles. The microprocessor unit also records and stores pertinent patient



data for up to a year.

Siemens-Pacesetter resulted from a 1985 merger of the U.S. Pacesetter Systems, Inc. and Siemens-Elema AB, Solna, Sweden, a merger that created Siemens Worldwide Pacing Operations. The merged company is one of the world's two largest manufacturers of cardiac pacemaker system and accessories; together they produce some 70,000 pacemakers a year.

Siemens-Elema developed the world's first pacemaker, implanted in 1958. Pacesetter Systems, formed in 1969 in a joint effort with the Applied Physics Laboratory of The Johns Hopkins University, was the first to apply aerospace technology to the medical sector. Pacesetter Systems introduced the first long-life cardiac pacemaker in 1973, employing technology developed for spacecraft electrical power systems. In 1979, Pacesetter was first to utilize bidirectional telemetry, which allows physicians to monitor noninvasively and modify the interaction of the heart and a cardiac device.

*Synchrony is a registered trademark of Siemens-Pacesetter, Inc.

