



### Implantable Heart Aid

The latest of many spinoffs from miniaturized space circuitry is a tiny patient heart-assist device, implanted like the pacemaker, that could annually prevent thousands of deaths caused by the erratic heart action known as ventricular fibrillation. The fibrillating heart loses its ability to pump blood, a condition which causes death or permanent brain damage in a matter of minutes if not immediately corrected. The new device—called the AID™ implantable automatic pulse generator—monitors the heart continuously, recognizes the onset of ventricular fibrillation, and then delivers a corrective electrical shock. The AID pulse generator is, in effect, a miniaturized version of the defibrillator used by emergency squads and hospitals to restore rhythmic heartbeat after fibrillation, but it has the unique advantage of being permanently available to the patient at risk. Once implanted, it needs no specially trained personnel nor additional equipment. Shown above, the AID system consists of a micro-computer, a power source and two electrodes which sense heart activity.

After years of development and more than two years of animal and laboratory testing, the AID pulse generator is being clinically tested at Johns Hopkins University Hospital, Baltimore, Maryland. It was developed by Medrad Incorporated and Intec Systems, Inc., both of Pittsburgh, Pennsylvania, in conjunction with Drs. M. Mirowski and M. Mower of Sinai Hospital and Johns Hopkins University School of Medicine, both of Baltimore. With NASA funding, Johns Hopkins' Applied Physics Laboratory—an organization with extensive experience in applying space technology to design of implantable devices—

conducted an independent evaluation to assure that the pulse generator was ready for trials in selected patients who have high risk of experiencing ventricular fibrillation.

Applied Physics Laboratory developed an associated system. Shown below, it includes an external recorder to be worn by AID patients and a physician's console to display the data stored by the recorder. This system provides a record of fibrillation occurrence and the ensuing defibrillation, information important to the physician in prescribing further treatment.

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