

## PERSONAL CABIN PRESSURE ALTITUDE MONITOR

The Cabin Pressure Monitor, developed by Jan A. Zysko and patented by NASA, is a portable, accurate, valuable, important, and life-saving instrument with many applications. Because of its importance to the delivery of quality medical care, the NASA Biomedical Engineering Laboratory has purchased several of these instruments from the NASA licensee to add to the inventory of emergency medical equipment used to support air medical evacuation of injured personnel and flight crew.



*NASA Inventor Jan A. Zysko with his Piper Cherokee*

In response to varying needs, NASA developed the Personal Cabin Pressure Altitude Monitor and Warning System, which senses the local pressure environment while operating independently of other aircraft or spacecraft systems. The monitor warns by means of audio, vibratory, and visual alarms of the impending danger of hypoxia when cabin pressure has fallen below preprogrammed threshold levels. A lighted digital screen displays a warning text message and also annotates the pressurization condition causing the alarm.

The nature of hypoxia can render a crew helpless very quickly. An average adult in good health could expect less than one minute time of useful consciousness after being subjected to a pressure equivalent to an altitude of 35,000 feet, whereas at 25,000 feet he/she could be fully aware and functioning for only three to five minutes. The device provides a timely warning to the crewmember(s) while they are still mentally and physically able to take corrective action. The need to introduce the CPM to the private sector was galvanized by the Payne Stewart aircraft accident in October 1999. Investigators point to the loss of pressurization as the probable cause. A strikingly similar accident happened in Perth, Australia, a year later.

In its initial NASA application, the device protects workers in the Kennedy Space Center (KSC) Mars Simulation Chamber from an accidental pump down to a high altitude condition.

The first cabin Pressure monitor prototypes were introduced to the public at the EAA Air Venture Oshkosh 2000 air show in July 2000. After an industry briefing, the technology was licensed to Kelly Manufacturing Company, the largest manufacturer of general aviation aircraft instruments in the world, in January 2002.



*Personal Cabin Pressure Monitor*

Kelly Aviation, a subsidiary of Kelly Manufacturing, was initially set up to manufacture and sell the PCM 1000 and produced the first models for sale in March 2003. Although the device is not an FAA certified flight instrument, nor is it meant to replace such, it can serve as a viable alternative for determining altitude in an emergency situation or as a simple check of primary instrument function. The instrument is currently being used by rural water districts in a non-aviation use to calculate head pressures at various locale based on the differential altitude measurements between the source and the end-user. It is also in use by mountain climbers. The personal Cabin Pressure Altitude Monitor and Warning System retails for about \$400 per unit.