



At left is a Fisher Space Pen, one of a score of space pen models manufactured by Fisher Pen Company, Forest Park, Illinois. Originally developed for NASA astronaut record-keeping on Apollo missions, the pens were also purchased by the Soviet Union for cosmonaut use and the resultant publicity helped build a multimillion dollar a year civil market for the pens.

Developed personally by company president and founder Paul C. Fisher, the Fisher Space Pen was created to allow writing in orbit where ordinary pens that rely on gravity and atmospheric pressure for ink flows are inadequate. Fisher's answer was a cartridge pressurized with nitrogen. The cartridge seals out air, preventing evaporation and oxidization of the ink; interior pressure forces ink outward toward the ball point regardless of gravity condition or the position in which the pen is held. A companion Fisher development was a special "thixotropic" visco-elastic (rubberlike liquid) ink, needed because standard ink would ooze out of the ball point under pressure. The thixotropic ink is almost solid; only when the ball point revolves does friction liquefy just enough ink

for smooth writing. These features combine to provide advantages in everyday Earth use of the pens, for example, uniform ink flow without skipping, long pen life, and the ability to write on many types of surfaces, even under water (lower left).

To meet NASA specifications, the Fisher Space Pen had to demonstrate failproof operation at temperatures from minus 50 to plus 45 degrees Fahrenheit and to withstand atmospheric extremes from pure oxygen to hard vacuum. The antigravity pen passed those tests and also demonstrated continuous-writing endurance several times better than the NASA requirement.

The pens were introduced to space service on the Apollo 7 mission and have been in regular NASA use since then. ▲