2001 Achievement Award

Judith A. Clapp
Senior Principal Software Systems Engineer
The MITRE Corporation

A pioneer in establishing software engineering as a discipline, Judith Clapp has made a significant contribution to technologies for managing the development and acquisition of large-scale command and control systems, and has motivated and encouraged the professional growth of other software engineers as their manager, role model, and mentor.

Judith A. Clapp's career spans the history of software engineering as a technology and as a profession. She received her bachelor's in physics from Smith College in 1951, and master's in applied science with a concentration in computer science from Radcliffe in 1952. That same year, she joined a small team at the Massachusetts Institute of Technology (MIT) using Whirlwind, one of the earliest digital computers.

She was the only woman on the team, which developed a proof-of-concept prototype for an air defense system. By doing so, the team demonstrated a revolutionary new use of computers as real-time control systems rather than automated calculators for grinding out mathematical tables. When the Air Force funded the development of a full-blown air defense system, Clapp assumed management and technical responsibilities for portions of the largest software system ever developed, requiring hundreds of programmers. She helped develop a set of automated aids so that programmers could write, edit, and test their software. This represented the first acknowledgement of the need for the discipline of software engineering. Clapp became co-director of software for the combat centers that directed the air defense operations. When the project was transferred from MIT to Lincoln Laboratory, she moved with it. In 1959, she and the project moved to The MITRE Corporation.

Clapp has remained at MITRE as a manager and project leader and is a senior principal software systems engineer. Most of her work has been for the Department of Defense (DOD), particularly for the Air Force Electronic Systems Center. The focus of her work has been on software engineering technology and the management processes needed for the acquisition of large, complex command and control systems. As software became the major source of cost and schedule overruns for these systems, she was given responsibility for Air Force projects in software engineering research. Her research activities have included one of the first on-line data base management systems, the first use of microprogramming to create a new machine architecture for multiprogramming, development of techniques for automated text searching for the Patent Office, and use of artificial intelligence techniques for NASA space shuttle launches. She served on the DOD Working Group that sponsored the programming language Ada, which was mandated for all DOD systems.

In addition to software engineering technology, Clapp's work includes management aspects of software development and acquisition, such as cost estimation techniques and metrics for software management adopted as DOD requirements. She has been requested to serve on many independent assessment teams that are called upon to solve problems that arise in the acquisition and development of large software-intensive government systems. She was the first in her company to advocate and exploit Internet technology to create a knowledge base for

engineers. She currently serves on the MITRE information policy committee and the corporate knowledge management team.

Clapp has served as a mentor to women in her company and community, including college students. She was a founder of the professional women's group at MITRE in the early 1970s. In 1997, she was honored as a "Leading Woman" by the Patriot Girl Scouts and also by the Grace Hopper Celebration of Women in Computing. She was featured in the January, 1995 issue of Communications of the ACM as a pioneering woman in computing.