Computer Operators

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Significant Points

- Computer operators are projected to be among the most rapidly declining occupations over the 2006-16 decade because advances in technology are making the duties traditionally performed by computer operators obsolete.

- Computer operators usually receive on-the-job training; the length of training varies with the job and the experience of the worker.

- Opportunities will be best for operators who have formal computer education, are familiar with a variety of operating systems, and keep up with the latest technology.

Nature of the Work

Computer operators oversee the operation of computer hardware systems, ensuring that these machines are used as efficiently and securely as possible. They may work with mainframes, minicomputers, or networks of personal computers. Computer operators must anticipate problems and take preventive action, as well as solve problems that occur during operations.

The duties of computer operators vary with the size of the installation, the type of equipment used, and the policies of the employer. Generally, operators control the console of either a mainframe digital computer or a group of minicomputers. Working from operating instructions prepared by programmers, users, or operations managers, computer operators set controls on the computer and on peripheral devices required to run a particular job.

Computer operators load equipment with tapes, disks, and paper, as needed. While the computer is running—which may be 24 hours a day—computer operators monitor the control console and respond to operating and computer messages. Messages indicate the individual specifications of each job being run. If an error message occurs, operators must locate and solve the problem or terminate the program. Operators also maintain logbooks or operating records that list each job run and events that occur during their shift, such as machine malfunctions. Other computer operators perform and monitor routine tasks, such as tape backup, virus checking, software upgrading, and basic maintenance. In addition, computer operators may help programmers and systems analysts test and debug new programs.

A greater number of computer operators are working on personal computers (PCs) and minicomputers, as the number and complexity of computer networks continues to grow. In many offices, factories, and other work settings, PCs and minicomputers are connected in networks, often referred to as local area networks (LANs) or multi-user systems. While users in the area operate some of these computers, many require the services of full-time operators. The tasks they perform on PCs and minicomputers are very similar to those performed on large computers and include trying to keep the computer networks secure.

As organizations continue to look for opportunities to increase productivity, many tasks formerly performed by comput-
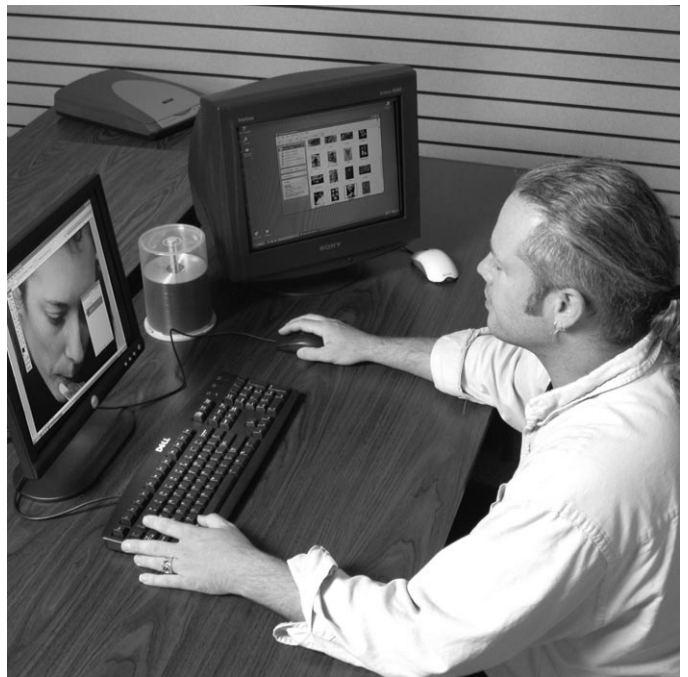
Computer operators monitor computer systems and watch for potential problems.

er operators are now being automated. New software enables computers to perform many routine tasks, formerly done by computer operators, without human interaction. Scheduling, loading, and downloading programs, mounting tapes, rerouting messages, and running periodic reports can be done without the intervention of an operator. As technology advances, the responsibilities of many computer operators are shifting to areas such as network operations, user support, and database maintenance.

Work environment. Computer operators generally work in well-lit, ventilated, comfortable rooms. Because many organizations use their computers 24 hours a day, 7 days a week, computer operators may be required to work evening or night shifts and weekends. Shift assignments usually are made based on seniority. However, increasingly automated operations will lessen the need for shift work because many companies can let the computer take over operations during less desirable working hours. In addition, telecommuting technologies, such as faxes, modems, and e-mail, and data center automation, such as automated tape libraries, enable some operators to monitor batch processes, check systems performance, and record problems for the next shift.

Because computer operators generally spend a lot of time in front of a computer monitor and perform repetitive tasks such as loading and unloading printers, they may be susceptible to eyestrain, back discomfort, and hand and wrist problems.

Training, Other Qualifications, and Advancement

Computer operators generally require a high school degree and are trained by employers on the job. Most computer operators expect to advance to other positions in the information technology field within a few years.

Education and training. Computer operators usually receive on-the-job training to become acquainted with their employer's equipment and routines. The length of training varies with the job and the experience of the worker. However, previous work experience is key to obtaining an operator job in many large es-

tablishments. Employers generally look for specific, hands-on experience with the type of equipment and related operating systems they use. Additionally, formal computer training, perhaps through a community college or technical school, can be useful. Related training also can be obtained through the U.S. Armed Forces and from some computer manufacturers. As computer technology changes and data processing centers become more automated, employers will increasingly require candidates for operator jobs to have formal training and related experience.

Other qualifications. Computer technology changes so rapidly that operators must be adaptable and willing to learn. Operators who work in automated data centers also need analytical and technical expertise to deal with unique or high-level problems that a computer is not programmed to handle. Operators must be able to communicate well and to work effectively with programmers, users, and other operators. Computer operators also must be able to work independently because they may have little or no direct supervision.

Advancement. Some computer operators may advance to supervisory jobs, although most management positions within data processing or computer operations centers require advanced formal education, such as a bachelor's or graduate degree. Computer operators may advance to jobs in areas such as network operations or support through on-the-job experience and additional formal education. As they gain experience in programming, some operators may advance to jobs as programmers or analysts, but a move into these types of jobs is becoming much more difficult because employers increasingly require at least a bachelor's degree for more skilled computer jobs.

Employment

Computer operators held about 130,000 jobs in 2006. Jobs are found in various industries such as government, health care, manufacturing, data processing services and other information industries, and finance and insurance. They are also employed by some firms in computer systems design and related services as more companies contract out their data processing operations.

Job Outlook

Computer operators continue to be one of the occupations with the most rapidly declining employment. Although computers are increasingly prevalent in the workplace, improved software and automation of many systems are quickly reducing the need for this occupation. Some job openings may, nevertheless, be available to replace workers who leave the occupation.

Employment change. Employment of computer operators is projected to decline by 25 percent because advances in technology are making obsolete many of the duties traditionally performed by these workers. Technological advances have reduced both the size and cost of computer equipment while increasing the capacity for data storage and processing automation. Sophisticated computer hardware and software are now used in practically every industry in such areas as factory and office automation, telecommunications, health care, education, and government. The expanding use of software that automates computer operations gives companies the option of making systems more efficient, but greatly reduces the need for operators. Such improvements require operators to monitor a greater number of operations at the same time and solve a broader range of problems that may arise. The result is that fewer operators will be needed to perform more highly skilled work.

Computer operators who are displaced by automation may be reassigned to support staffs that maintain personal computer networks or assist other members of the organization. Operators who keep up with changing technology by updating their skills through additional training should have the best prospects of moving into other areas such as network administration and technical support. Others may be retrained to perform different job duties, such as supervising an operations center, maintaining automation packages, or analyzing computer operations to recommend ways to increase productivity. In the future, operators who wish to take advantage of changing job opportunities in the computer field will need to know more about programming, automation software, graphics interface, client-server environments, and open systems.

Job prospects. Experienced operators are expected to face competition for the few job openings that will arise each year to replace workers who transfer to other occupations or leave the labor force. Opportunities will be best for operators who have formal computer education, familiarity with a variety of operating systems, and knowledge of the latest technology.

Earnings

Median annual earnings of computer operators were $33,560 in May 2006. The middle 50 percent earned between $25,990 and $43,060 per year. The highest 10 percent earned more than $51,970, and the lowest 10 percent earned less than $20,510.

Related Occupations

Other occupations involving work with computers include computer software engineers; computer programmers; computer support specialists and systems administrators; computer systems analysts, and computer scientists and database administrators. Other occupations in which workers operate electronic office equipment include data entry and information processing workers and secretaries and administrative assistants.

Sources of Additional Information

For information about work opportunities in computer operations, contact establishments with large computer centers, such as banks, manufacturing firms, insurance companies, colleges and universities, and data processing service organizations. The local office of the State employment service can supply information about employment and training opportunities.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-16	
				Number	Percent
Computer operators...	43-9011	130,000	98,000	-32,000	-25

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.