Computer, Automated Teller, and Office Machine Repairers

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Significant Points

- Workers qualify for these jobs by receiving training in electronics from associate degree programs, the military, vocational schools, equipment manufacturers, or employers.

- Employment is expected to grow more slowly than the average for all occupations.

- Job prospects will be best for applicants with knowledge of electronics, and who have formal training and repair experience.

Nature of the Work

Computer, automated teller, and office machine repairers install, fix, and maintain many of the machines that are common to businesses and households. Some repairers travel to customers' workplaces or other locations to make the necessary repairs. These workers—known as *field technicians*—often have assigned areas in which they perform preventive maintenance on a regular basis. *Bench technicians* work in repair shops located in stores, factories, or service centers. In small companies, repairers may work both in repair shops and at customer locations.

Computer repairers, also known as *computer service technicians* or *data processing equipment repairers*, service mainframe, server, and personal computers; printers; and auxiliary computer equipment. These workers primarily perform hands-on repair, maintenance, and installation of computers and related equipment. Workers who provide technical assistance, in person or by telephone, to computer system users are known as computer support specialists or computer support technicians. (See the section on computer support specialists and systems administrators elsewhere in the *Handbook*.)

Computer repairers usually replace subsystems instead of repairing them. Replacement is common because subsystems are inexpensive and businesses are reluctant to shut down their computers for time-consuming repairs. Subsystems commonly replaced by computer repairers include video cards, which transmit signals from the computer to the monitor; hard drives, which store data; and network cards, which allow communication over the network. Defective modules may be given to bench technicians, who use software programs to diagnose the problem and who may repair the modules, if possible.

Office machine and cash register servicers work on photocopiers, cash registers, mail-processing equipment, and fax machines. Newer models of office machinery include computerized components that allow them to function more effectively than earlier models.

Office machine repairers usually work on machinery at the customer's workplace. However, if the machines are small enough, customers may bring them to a repair shop for maintenance. Common malfunctions include paper misfeeds caused by worn or dirty parts, and 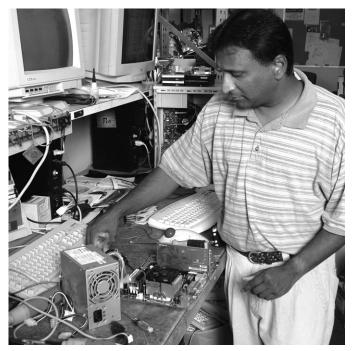poor-quality copy resulting from problems with lamps, lenses, or mirrors. These malfunctions usually can be resolved simply by cleaning the relevant components. Breakdowns also may result from the failure of commonly used parts. For example, heavy use of a photocopier may wear down the printhead, which applies ink to the final copy. In such cases, the repairer usually replaces the part instead of repairing it.

Automated teller machine servicers install and repair automated teller machines (ATMs). These machines allow customers to carry out bank transactions without the assistance of a teller. ATMs also provide a growing variety of other services, including stamp, phone card, and ticket sales.

When ATMs malfunction, computer networks recognize the problem and alert repairers. Common problems include worn magnetic heads on card readers, which prevent the equipment from recognizing customers' bankcards, and "pick failures," which prevent the equipment from dispensing the correct amount of cash. Field technicians travel to the locations of ATMs and usually repair equipment by removing and replacing defective components. Broken components are taken to a repair shop, where bench technicians make the necessary repairs. Field technicians perform routine maintenance on a regular basis, replacing worn parts and running diagnostic tests to ensure that the equipment functions properly.

To install large equipment, such as mainframe computers and ATMs, repairers connect the equipment to power sources and communication lines that allow the transmission of information over computer networks. For example, when an ATM dispenses cash, it transmits the withdrawal information to the customer's bank. Workers also may install operating software and peripheral equipment, checking that all components are configured to function together correctly.

Computer, automated teller, and office machine repairers use a variety of tools for diagnostic tests and repair. To diagnose malfunctions, they use multimeters to measure voltage, current, resistance, and other electrical properties; signal generators to provide test signals; and oscilloscopes to monitor equipment signals. To

Computer repairers perform hands-on repair, maintenance, and installation of computers and related equipment.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-16	
				Number	Percent
Computer, automated teller, and office machine repairers................	49-2011	175,000	180,000	5,200	3

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*.

diagnose computerized equipment, repairers use software programs. To repair or adjust equipment, workers use handtools, such as pliers, screwdrivers, soldering irons, and wrenches.

Work environment. Repairers usually work in clean, well-lighted surroundings. Because computers and office machines are sensitive to extreme temperatures and humidity, repair shops usually are air-conditioned and well ventilated. Field repairers must travel frequently to various locations to install, maintain, or repair customers' equipment. ATM repairers may have to perform their jobs in small, confined spaces that house the equipment.

Because computers and ATMs are critical for many organizations to function efficiently, data processing equipment repairers and ATM field technicians often work around the clock. Their schedules may include evening, weekend, and holiday shifts, sometimes assigned on the basis of seniority. Office machine and cash register servicers usually work regular business hours because the equipment they repair is not as critical. Most repairers work about 40 hours per week, but about 12 percent work more than 50 hours per week.

Although their jobs are not strenuous, repairers must lift equipment and work in a variety of postures. Repairers of computer monitors need to discharge voltage from the equipment to avoid electrocution. Workers may have to wear protective goggles.

Training, Other Qualifications, and Advancement

Knowledge of electronics is required, and employers prefer workers with formal training. Office machine and ATM repairers usually have an associate degree. Certification is available for entry-level workers, as well as experienced workers seeking advancement.

Education and training. Knowledge of electronics is necessary for employment as a computer, automated teller, or office machine repairer. Employers prefer workers who are certified or who have training in electronics from an associate degree program, the military, a vocational school, or an equipment manufacturer. Employers generally provide some training to new repairers on specific equipment; however, workers are expected to arrive on the job with a basic understanding of equipment repair. Employers may send experienced workers to training sessions to keep up with changes in technology and service procedures.

Most office machine and ATM repairer positions require an associate degree in electronics. A basic understanding of mechanical equipment also is important because many of the parts that fail in office machines and ATMs, such as paper loaders, are mechanical. Entry-level employees at large companies normally receive on-the-job training lasting several months. Such training may include a week of classroom instruction, followed by a period of 2 weeks to several months assisting an experienced repairer.

Certification and other qualifications. Various organizations offer certification. Certification demonstrates a level of competency, and can make an applicant more attractive to employers.

Field technicians work closely with customers and must have good communications skills and a neat appearance. Employers may require that field technicians have a driver's license.

Certification and advancement. Newly hired computer repairers may work on personal computers or peripheral equipment. With experience, they can advance to positions maintaining more sophisticated systems, such as networking equipment and servers. Field repairers of ATMs may advance to bench technician positions responsible for more complex repairs. Experienced workers may become specialists who help other repairers diagnose difficult problems or who work with engineers in designing equipment and developing maintenance procedures. Experienced workers also may move into management positions responsible for supervising other repairers.

Because of their familiarity with equipment, experienced repairers may move into customer service or sales positions. Some experienced workers open their own repair shops or become wholesalers or retailers of electronic equipment.

Certification may also increase one's opportunities for advancement. Certification is available for workers with varying levels of skills and experience. To obtain certification, workers generally must pass an examination corresponding to their skill level.

Employment

Computer, automated teller, and office machine repairers held about 175,000 jobs in 2006. Wholesale trade establishments employed about 31 percent of the workers in this occupation; most of these establishments were wholesalers of professional and commercial equipment and supplies. Many workers also were employed in computer and software stores and office supply stores. Others worked in electronic and precision equipment repair shops and computer systems design firms. About 20 percent of computer, automated teller, and office machine repairers were self-employed, compared to 7 percent for all installation, maintenance, and repair occupations.

Job Outlook

Employment is expected to grow more slowly than the average for all occupations. Opportunities will be best for applicants with knowledge of electronics, formal training, and previous experience.

Employment change. Employment of computer, automated teller, and office machine repairers is expected to grow by 3 percent from 2006 to 2016, which is slower than the average for all occupations. Limited job growth will be driven by the increasing dependence of business and individuals on computers

and other sophisticated office machines. The need to maintain this equipment will create new jobs for repairers.

Although computer equipment continues to become less expensive and more reliable, malfunctions still occur and can cause severe problems for users, most of whom lack the knowledge to make repairs. Computers are critical to most businesses today and will become even more so as companies increasingly engage in electronic commerce, and as individuals continue to bank, shop, and pay bills online.

People also are becoming increasingly reliant on ATMs. Besides offering bank and retail transactions, ATMs provide an increasing number of other services, such as employee information processing and distribution of government payments. The relatively slow rate at which new ATMs are installed, however, and the fact that they are becoming easier to repair, will limit demand for ATM repairers.

Conventional office machines, such as calculators, are inexpensive, and often are replaced instead of repaired. However, digital copiers and other, newer office machines are more costly and complex. This equipment often is computerized, designed to work on a network, and capable of performing multiple functions. But because this equipment is becoming more reliable, job growth in office machine repairers will be limited as well.

Job prospects. In addition to new job growth, a number of openings will result from the need to replace workers who retire or leave the occupation. Job prospects will be best for applicants with knowledge of electronics, formal training, and repair experience.

Earnings

Median hourly earnings of wage-and-salary computer, automated teller, and office machine repairers were $17.54 in May 2006. The middle 50 percent earned between $13.56 and $22.44. The lowest 10 percent earned less than $10.65, and the highest 10 percent earned more than $27.36. Median hourly earnings in the industries employing the largest numbers of computer, automated teller, and office machine repairers in May 2006 were:

Computer systems design and related services.....................$19.41
Professional and commercial equipment
  and supplies merchant wholesalers.......................................19.09
Office supplies, stationery, and gift stores 16.64
Electronic and precision equipment repair
  and maintenance..15.82
Computer and software stores...15.20
Electronics and appliance stores 14.71

Related Occupations

Workers in other occupations who repair and maintain electronic equipment include electronic home entertainment equipment installers and repairers; home appliance repairers; broadcast and sound engineering technicians and radio operators; precision instrument and equipment repairers; electrical and electronics installers and repairers; electricians; radio and telecommunications equipment installers and repairers; coin, vending, and amusement machine servicers and repairers; industrial machinery mechanics and maintenance workers; and maintenance and repair workers, general.

Sources of Additional Information

For information on careers and certification, contact:
➤ ACES International, 5241 Princess Anne Rd., Suite 110, Virginia Beach, VA 23462.
Internet: **http://www.acesinternational.org**
➤ Electronics Technicians Association International, 5 Depot St., Greencastle, IN 46135. Internet: **http://eta-i.org**
➤ International Society of Certified Electronics Technicians, 3608 Pershing Ave., Fort Worth, TX 76107-4527.
Internet: **http://www.iscet.org**