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Employer and Training Needs: Report 15 Electro-Mechanical Electronics

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Report Number Fifteen



ELECTRO-MECHANICAL ELECTRONICS

EMPLOYER AND TRAINING NEEDS

PREPARED FOR METROPOLITAN TECHNICAL COMMUNITY COLLEGE



Center for Applied Urban Research

university of
nebraska 
at omaha 

ELECTRO-MECHANICAL ELECTRONICS

by

Joan V. Holley

ELECTRO-MECHANICAL ELECTRONICS

Background and Purpose of the Study

Metropolitan Technical Community College offers two programs in electronics technology. As stated in the 1979-80 Metro Tech catalog, the One-Year Certificate Option in Electronics Technology provides an introduction to all types of electrical and electronics work and enables graduates to enter company training programs or to become assistants to certified technicians. While preparing students for employment in the electronics communications field, the Two-Year Associate Degree Option in Electronics Technology also is designed to provide a comprehensive knowledge of electronics which may be applied to many other employment requirements.

The purpose of this study is to identify the Omaha-area employer and training needs for technicians in an occupational area designated as "electro-mechanical electronics." This area of specialization within the electronics field has been divided into two employment categories: 1) bio-medical electronics and 2) industrial electronics.

As defined in a previous employer and training needs study by the Center for Applied Urban Research for Metro Tech:

An electronic bio-medical technician is a person who maintains, repairs, calibrates, adapts, or does research design for many kinds of electronic apparatus used in medical therapy, diagnosis, and research.

An industrial electronics technician is a person who does similar work on the electronic instruments that control the machinery used in business and industry.

Study Design and Execution

Industrial Electronic Technology

Listed under the heading "Electronic Equipment & Supplies--Repairing" in the Omaha metropolitan telephone book are five companies that specialize in the installation, repair, and maintenance of the electronic instruments that control the machines used by local businesses and industries. The managers and owners of these electronic repair companies were found to be knowledgeable about which businesses and industries in Omaha utilize electronic instruments and were able to identify the larger industries that maintain their own staffs of

electro-mechanical technicians and those that have contracts for service with electronic repair companies. Thus, the target population for the industrial electronics employment category consisted of representatives of these local electronic repair companies and the personnel directors from a sampling of those firms that have their own staffs of electro-mechanical technicians. The survey instrument used in the previous employer and training needs studies was administered both over the telephone and during personal interviews. The research findings and conclusions about the need for employees in this field and the education necessary for working in electro-mechanical electronics are presented in this report.

Electronic Bio-Medical Technology

The Center for Applied Urban Research has just completed a study for Metro Tech of the employer and training needs in electronic bio-medical technology as one of the 11 employment studies in the field of health care. The conclusions of this recent research on electronic bio-medical technology will be presented here.

Research Findings

Industrial Electronics

Electronic Equipment Service Companies. Most of these service companies install and service the instruments that control production equipment. These instruments usually are related to the speed, starting and stopping, measurement, temperature, and pressure of the mechanisms used by different industries. The electronic repair company owners and managers discussed the different types of equipment controlled by electronic instruments, such as printing equipment, counting machines, industrial paper cutters, and packaging and bottling machines. Some of these electronic service companies also repair and maintain data processing and other computer systems. The owner of Wellington Electronic Service called his business a "third party service," explaining the three facets of the electronics field: 1) the local industry or business, 2) the out-of-town manufacturer of the electronic instruments used by the industry or business, and 3) the electronic service company that installs, maintains, and services these sophisticated instruments.

The electronic repair companies were found to be mostly small owner/manager organizations, employing from one to five assistants. Describing his shop as a

"one-man shop," the owner of the Industrial Electronics Service estimated that he had more than one-third of the local contracts for industrial electronic servicing. The owner of the Midwestern Service Labs had one assistant who is completing an electrical engineering degree at the University of Nebraska at Omaha. These electro-mechanical technicians were paid from \$4.50 to \$10.00 an hour.

While only five of these industrial electronics repair companies are in Omaha, with each employing only a few assistants, the owners talked of the demand for qualified electro-mechanical technicians. Several explained that an increasing number of smaller companies are converting from pneumatic to electronic equipment and will need their services, while the number of larger businesses and industries that have regular staffs of electro-mechanical technicians also is expanding.

The saturation of the field of electronics with technicians seeking work in television and radio repair was mentioned by some of these entrepreneurs. One study participant said:

TV and radio repair is a dying business. People just replace their transistor radios, and they couldn't afford to pay you what it would take to find out what's wrong with TV and radio sets anyway. Repairmen don't need all the circuitry know-how anymore. The factories supply replaceable components and circuit boards, so you can just drop in the new part and send the old one to the factory. The CB craze is over. Not so many TV and radio repairmen are needed now.

The electronic service company owners spoke optimistically about the field of industrial electronics. One explained that while the TV repairman can just replace the relatively inexpensive component, the industrial electronic technician can find the problem with the circuits. A part in a TV set could cost \$2.00, while the entire industrial electronic component might cost \$500.

Suggestions for educational preparation for this field included a strong background in electronics, with courses in computer science and basic mechanics. One interviewee said, "The industrial electronic technician needs to know all about changing gear boxes and adjusting clutches in addition to instrumentation." Another said a need exists for a thorough understanding of computers, including the knowledge and skills to be able to design them. Some of these electronic service companies have employed technicians who had Army or Navy electronic education and experience.

Employment in Local Businesses and Industries. From lengthy lists of local businesses and industries that employ electro-mechanical technicians the conclusion could be drawn that most larger organizations now utilize electronic

instruments in their work and need employees to maintain and service this equipment. The firms included in the study employed from five to 60 electro-mechanical technicians. However, the differences in the organization, equipment used, and product of each company are reflected in the differences in the educational background and job requirements of the business. Also, the unavailability of persons trained for electro-mechanical technician jobs has caused businesses and industries to devise their own methods of securing and training the needed industrial technicians.

For instance, Continental Can Company employs eight journeyman electricians for \$11 an hour to do the work in the job category designated as "electronic repairman." These electricians were sent to the training programs sponsored by the manufacturer of the equipment to learn how to repair these instruments.

Like many local industries, the Quaker Oats Company uses a combination of pneumatic and electronic equipment. Quaker Oats has established its own apprenticeship program to train the five required technicians to service this equipment. Allied Chemical Company is another firm that uses a combination of pneumatic and electronic equipment, although Allied Chemical is gradually increasing the amount of electronic instrumentation used in production. The personnel manager of this fertilizer plant said that the industrial technician openings in the company have been very difficult to fill.

The Fort Calhoun power plant of the Omaha Public Power District employs about 60 persons in this job category, primarily to build and test the Western Electric test equipment. However, most of these industrial technicians were hired about 20 years ago when the company first opened the Omaha plant, and many of these employees received an associate engineering degree from the University of Nebraska at Omaha. This two-year program has been discontinued.

Several of the companies participating in the study had obtained employees from Iowa Western Community College and said that these graduates were very well prepared. Particularly, businesses that need electro-mechanical technicians with an understanding of computer science praised these Iowa Western graduates. The personnel manager of Control Data said his firm has about 40 to 50 electronic technicians working at the facility. He said that Control Data has developed a good working relationship with Metro Tech and praised the graduates of the Metro Tech programs as being well prepared for the work with the company.

Companies participating in this study paid the electro-mechanical technicians from \$4.00 an hour to \$1,955 a month. The personnel manager of McMartin Industries Inc. said that his firm had hired Hayes Associates, a national pay systems consulting firm, to assist them with its salary scale for electronic technicians. A wage scale from \$5.42 to \$8.00 an hour was determined to be competitive within a 500-mile radius of Omaha. The consulting company mentioned that similar technicians on the east or west coasts could receive wages two and one-half to three times that amount. The head electronics technician at The Omaha World-Herald said that the newspaper pays more than competitive salary to try to retain technicians since so much supervisory time is invested in on-the-job training. The World-Herald needs electronic technicians with a knowledge of computer science and found that these persons often would leave to go to other areas of the country.

All of the participants in this study said that a need for qualified job applicants exists in this field in Omaha. The response was unanimous to the question about the amount of training recommended as preparation for jobs in electro-mechanical technology, with the employers specifying a two-year program at a technical community college. These employers further indicated that a need exists for such a program in the Omaha area. The personnel manager of one of the large industries said that he had had a problem with four-year college graduates, since they often had unrealistic salary expectations. He stated, "Four-year graduates beginning with the company seem to want the same salaries that we are paying some of the technicians who have been with us for 20 or 30 years." Most of the employers of electro-mechanical technicians emphasized that some on-the-job training almost always is necessary since businesses and industries usually use equipment from different manufacturers.

Electronic Bio-Medical Technology

As stated in an earlier section of this report, the Center for Applied Urban Research has just completed a study of the employer and training needs in the field of electronic bio-medical technology. The Summary and Conclusions section of that study is presented here:

Medical electronics firms and Omaha hospitals were surveyed to determine employer and training needs for electronic bio-medical technicians.

All said they would be having new jobs in this field due to expansion and felt the need for trained people in the Omaha area was either great or that the number of jobs greatly exceeded the number of persons available to fill them.

Electronics technology was mentioned by everyone interviewed as necessary knowledge for the job. Aptitude for and some knowledge in various fields of science was deemed important as well as communications skills and knowledge of medical terminology. Most of the respondents felt that a two-year program at a technical community college would be the best preparation for the job, and they were unanimous in stating that Metro Tech should establish such a course of study.

Salaries varied from \$4.15 an hour to \$22,000 per year. Hospitals are planning to expand in this area, but pay scales are rather low so they may encounter some difficulty.

Conclusions

With the increasing use of electronic instrumentation in business, industry, and medicine, the field of electro-mechanical technology also is expanding. Electronic instruments have become the robots that control the performances of industrial production machinery and medical test equipment. Special technicians now are needed to install, maintain, and repair these electronic instruments.

In the field of industrial electronics, some electro-mechanical technicians work for small electronic service companies. However, more opportunities for employment are available with the many businesses and industries that maintain permanent staffs of electronic technicians.

The representatives of the electronic service companies, businesses, and industries all indicated that a need exists for qualified job applicants, and many recommended a two-year program to train technicians for positions with their companies. The participants in this study suggested that the program consist of a strong electronics background with courses in basic mechanics and computer science. Wages offered electro-mechanical technicians in Omaha ranged from \$4.00 an hour to \$1,955 a month.

A recent study by the Center for Applied Urban Research indicated that a similar demand for electronic bio-medical technicians exists in Omaha, with future expansion of the field anticipated. Wages in this job category ranged from \$4.15 an hour to \$22,000 a year. A two-year course of studies at a technical community college also was recommended as the best preparation for employment in this field, and the need for such a program in the Omaha area was mentioned by all of the employers interviewed. These representatives of medical electronics firms and local hospitals recommended that the electronic bio-medical technology curriculum consist of courses in science, medicine, and personal communication, in addition to the electronics technology course offerings.