

**Western Electric
Baltimore Works**

Welcome to the Baltimore Works

Have you ever thought of what happens when you dial a telephone? What is it that helps you reach a neighbor or a business associate 3,000 miles away? One reason is the Western Electric Company.

Many kinds of highly reliable telephone communications products are made and supplied to the Bell System network by Western Electric manufacturing locations across the country. In Baltimore, more than 7,000 men and women make thousands of miles of telephone cable and wire, and hundreds of pieces of associated equipment for the Bell Telephone companies each day.

Our company is the largest industrial employer in Baltimore City. Some products we make are familiar to you such as the spring cord on your telephone and the wires which connect your residence with an outside utility pole or underground terminal.

On the other hand, you may not recognize such product items as coaxial cable, call director cords or protector apparatus. In the pages that follow is the story of Western Electric's Baltimore Works and its communications role as the manufacturing and supply unit of the Bell System.



An overhead crane operator positions a reel of telephone cable for shipment from Western Electric's Cable building in Baltimore.

Baltimore Works Yesterday/Today

The great demand for telephone equipment in the 20's resulted in the development of a third major Western Electric manufacturing plant on the site of Baltimore's once famous Riverview amusement park.

The company broke ground for the Baltimore Works Cable plant in January 1929. Eight months later, the first reel of lead covered cable was completed and ready for shipment to Virginia. In May 1930, the Baltimore Works Wire shop started production of rubber covered wire using a new vulcanization process.

The plant grew so quickly in the first year that the company built bulkheads into the Patapsco River to accommodate a reel storage yard and port facilities. In 1931, a main cafeteria was opened and a new power plant was generating most of the energy requirements.

Plans for a Wire Electroforming building were unveiled in 1949. New additions to the Works include Apparatus, 1957; Merchandise, 1961; Industrial Relations Annex, 1962.



Riverview amusement park, above, "The Coney Island of the South", was purchased in 1929 for Western Electric's third manufacturing location, the Baltimore Works.



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Plastic Insu

The Baltimore Works Cable shop is one of the largest operations of its type in the world. Its two major products are plastic insulated (PIC), and coaxial cables.

PIC is also referred to as exchange area cable and is installed between telephone central offices and connects subscribers to the telephone exchange. Cable manufacturing begins with the drawing down of copper or aluminum rod to one of four main wire sizes through a series of industrial diamond dies. Every wire or conductor is insulated with a color coded polyethylene plastic. After the conductors are insulated, they are twisted into pairs.

Colorful paired wires are grouped into units, bound with plastic ribb



Engineer checks insulation of aluminum conductor wire before it is used in plastic insulated cable.

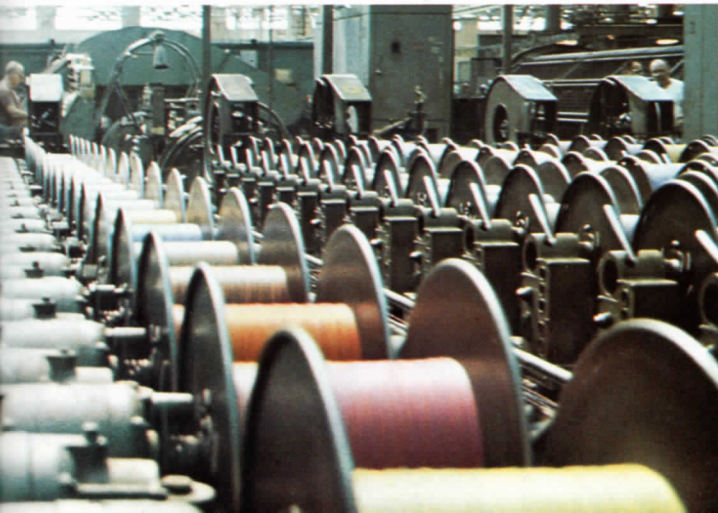


lated Cable

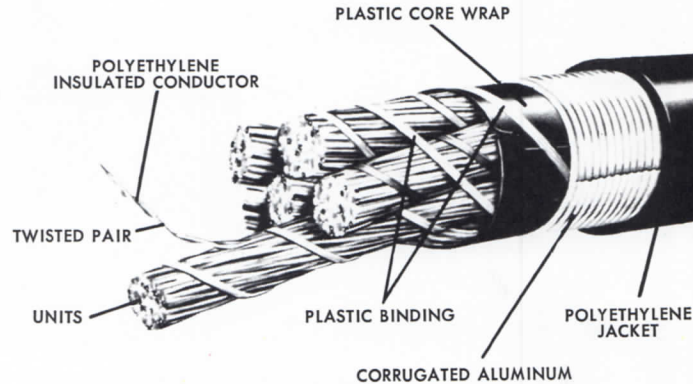
Twisting of the conductors is necessary to minimize "cross talk" or interference during telephone conversations.

The paired wires are then grouped into small units and bound with plastic ribbon by a cable stranding machine. These units are further combined into larger size cable cores by a cabling machine. The cable core then receives a wrapping of plastic tape, aluminum shielding and a polyethylene cover before it is stored on large reels for final inspection and shipment. Yearly, the Baltimore Works produces billions of conductor feet of PIC cable for Bell System customers.

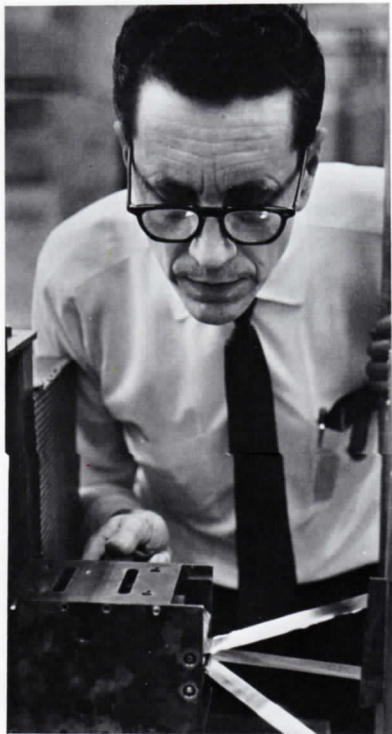
on, and combined to make a larger cable core by cabling machines.



Operator installs single spool containing insulated conductor for twisting. Two conductors are twisted together to minimize "cross talk" during phone calls in finished cable product.



Toll and Coaxial Cable



Baltimore Works engineer checks new stronger copper-steel laminated outer conductor for heavy duty long distance coaxial cable.

The Cable shop also makes Toll and Coaxial telephone cables used to handle Bell System long distance services as well as television transmission to the public. The Toll type cable is intended for use between central telephone offices in metropolitan areas.

The manufacturing of Toll cable consists of insulating copper wire with paper, twisting two insulated wires or coaxials together to form a pair, stranding these pairs into a compact core, removing moisture, covering the core with lead, and testing the end product.

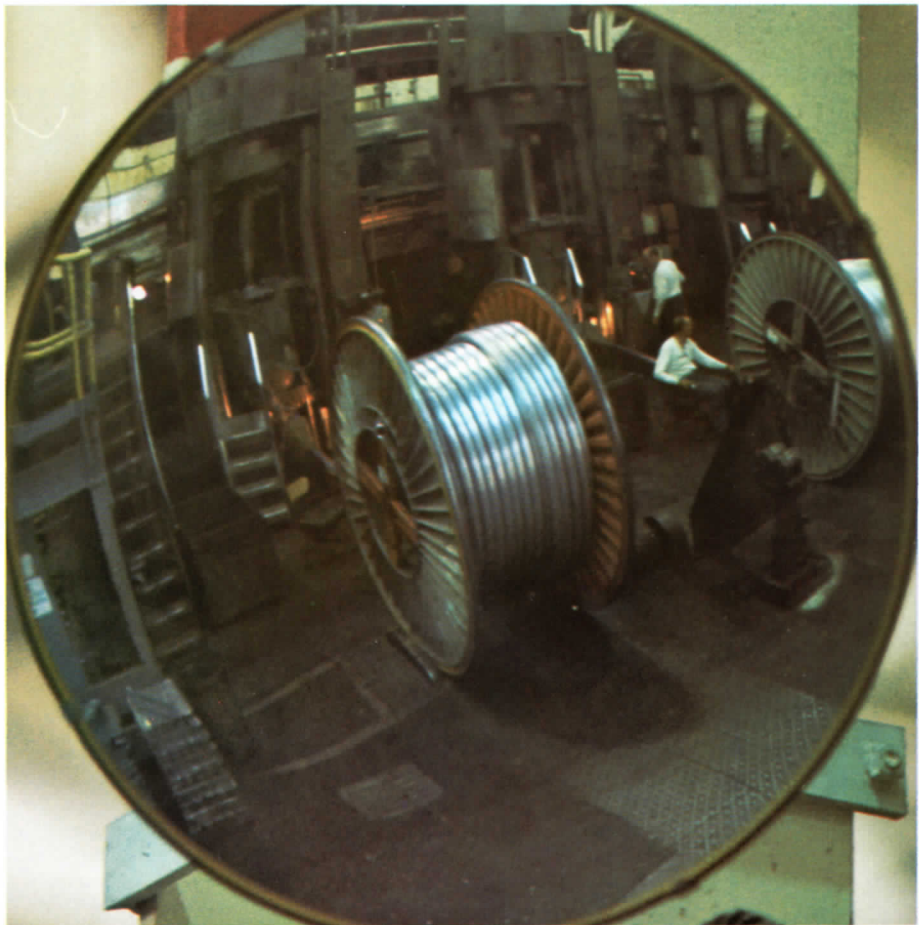
Another important communications medium is the Coaxial cable. This underground cable is utilized for coast-to-coast transmission systems to insure communications sur-

vival as a result of natural disasters or possible nuclear explosions. The modern coaxial conductor is a small copper tube with a copper wire held in the center by plastic disc insulators spaced about one inch apart. The name "coaxial" is given to this design because the tube and wire have the same center axis.

The twenty-tube coaxial, three inches in diameter and nine pounds per foot, is arranged in a circle around a center core of paper or plastic insulated wires used for communicating over short distances. The coaxials are then covered with lead and plastic. The cable, when united with a carrier system, can transmit 32,400 simultaneous television, voice and data services over routes of several thousand miles.

Overhead convex safety mirror reflects lead being extruded over toll cable.

After toll stranding, cable moisture in paper insulation is removed by driers where humidity is 10 times less than that of the air over the Sahara Desert.





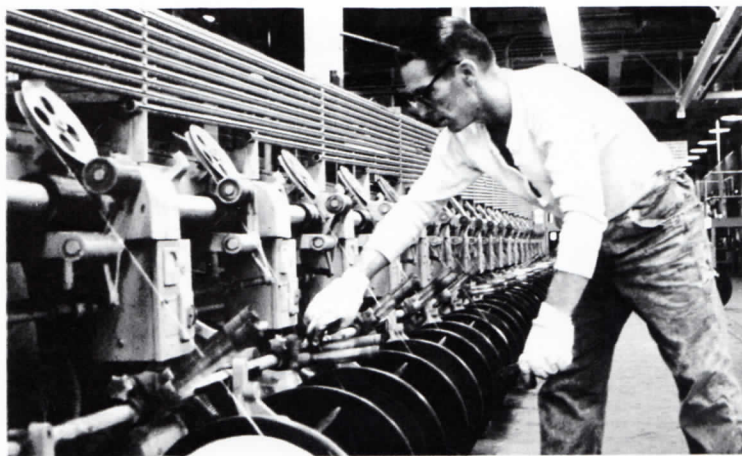
Electroformed Wire

The familiar wire which brings telephone service into the home from nearby underground cable or from telephone poles is called drop wire. During manufacture, the wire undergoes a unique chemical process in the plant's Electroforming building.

The steel wire conductor is plated with copper, lead and brass. This process increases the strength and reliability of the wire which is expected to serve for at least 20 years.

During Electroforming, the wire is run through nine chemical solutions and 32 treatments including washing and wiping. Within the Electroforming building are two giant plating machines which produce 7.2 million linear feet of coated wire in 24 hours.

Operator, above right, inspects plating as wire speeds through chemical bath. Copper nuggets, left, are dissolved in acid and plated to wires during the special process. Employee, right, removes reel of Electroformed wire, which is then sent to the Wire shop.



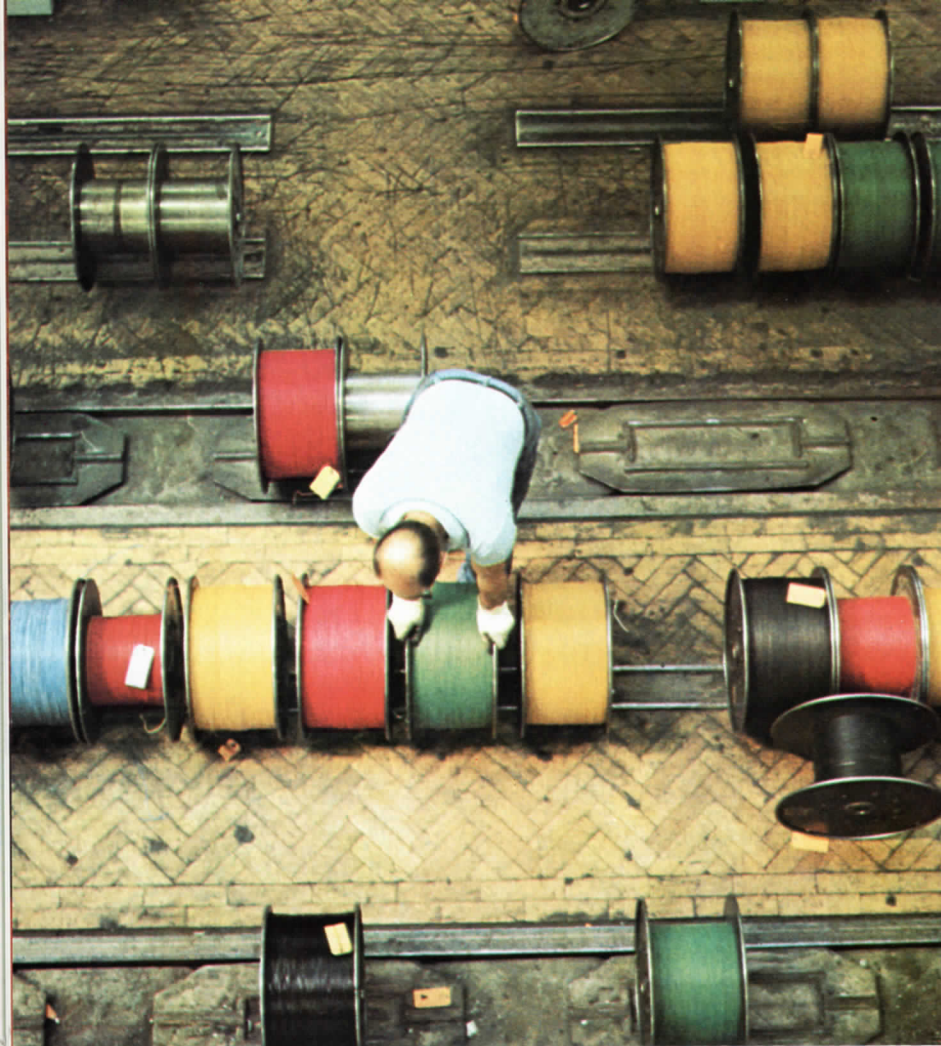
Telephone Wire

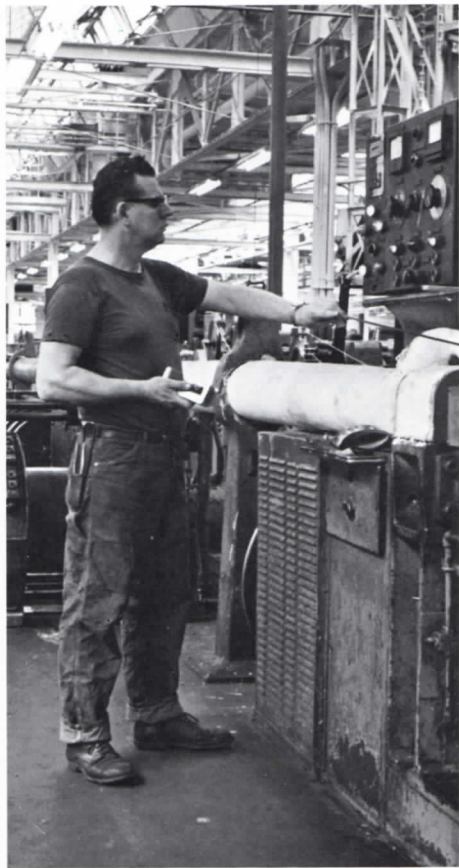
Wire shop manufacture centers around the production of inside and outside telephone wires. The former is used to connect telephones within a home or office while the latter links phone equipment to the outside pole or underground terminal.

One particular outside wire called "C" Drop is made by coating synthetic rubber on two parallel Electroformed wires. It is then wrapped with rayon. A neoprene jacket is coated over the rayon and then it is vulcanized and cooled before the finished wire is tested and coiled.

Materials for insulating and jacketing inside and outside wires are blended in special mixers, strained, rubber milled, stripped, cooled and carried to coating machines by mechanical process or overhead air conveyors. Some 23 million pounds of raw materials are processed annually to produce nearly 6 billion feet of wire.

Wire shop employee positions reel of "inside wire" used to connect telephones within a building.

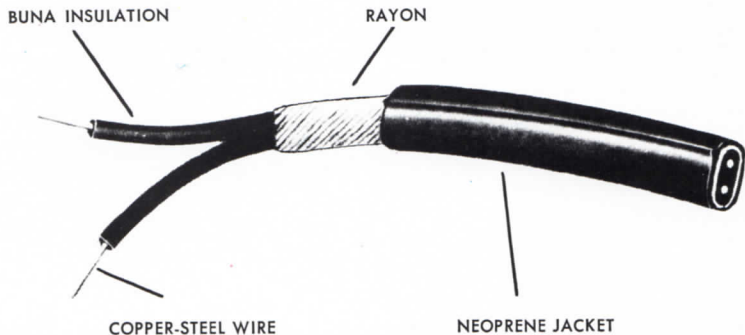




An operator checks the extrusion process of synthetic rubber used in the insulation of telephone drop wire.



Coiled "C" Drop wire, which connects a customer's telephone to a nearby outside cable, is readied for storage and shipment from the Baltimore Works.





Cord shop employee tapes metal links to prong-shaped connector on switchboard telephone cords.

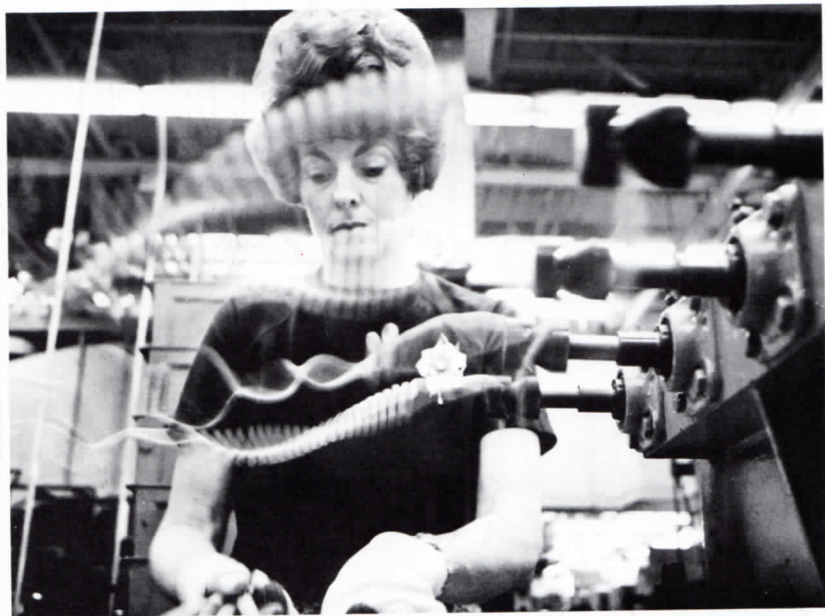
Telephone Cords

Each year millions of telephone cords are manufactured for Bell System customers in the Baltimore Works Cord shop. The most familiar cord known to the public is the spring cord which connects the handset to the telephone set itself. The spring is brought about by heating and coiling straight cordage to provide molecular memory and retractility.

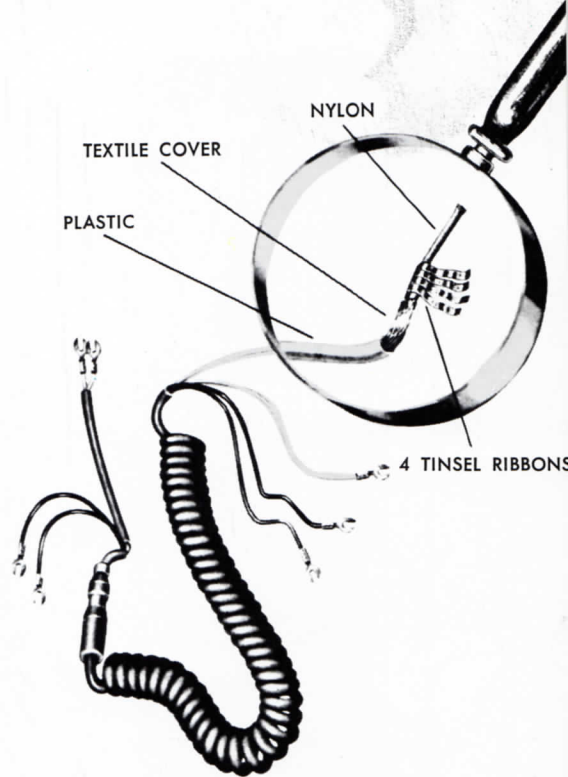
Other cords made here include switchboard, call director, push-button, station, test and miscellaneous telephone cords. Many of these cords are fitted with plugs consisting of eight to ten parts and molded or fitted together in a plastic shell. An example would be a switchboard plug used by telephone operators for making switchboard connections.

Punch press operator readies armored cords for banding and tipping.

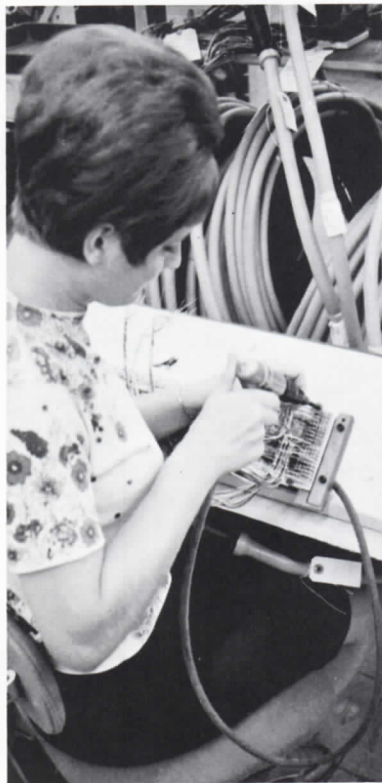




Spring cords receive reverse twists which provide extra retractile strength.



Telephone cords on a home phone have three to six conductors encased in plastic. Shown here are four thin bronze conductor ribbons wrapped around a nylon thread over which nylon and plastic coverings are applied.



Utilization of a wire-wrapping gun allows this young lady to make over 400 solderless connections on a single connector block.

Apparatus Products

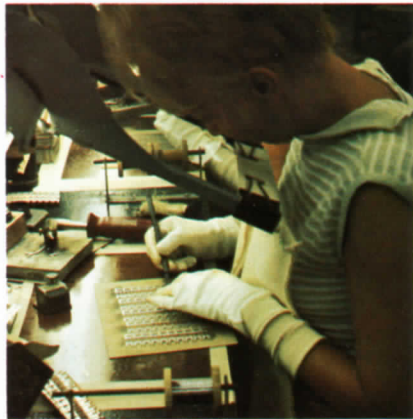
Millions of intricate parts are produced for Bell System communications equipment in facilities like Baltimore's Apparatus shop. There are some 1,200 associated pieces of apparatus manufactured from raw materials in the Apparatus shop. They can be broadly classified into connecting and protecting devices.

Much of the telephone connecting apparatus consists of plastic blocks designed to facilitate the orderly connection of hundreds of wires on customer premises and telephone central office buildings. Such connector pieces are called terminal blocks, terminal strips or connector blocks.

Protector apparatus functions like a household fuse. As an example, station protectors are installed in the telephone system to protect homes and telephone equipment from lightning damage or possible electrical overloads.

Major support operations in Ap-

paratus production include diecasting, plastic molding, and the machining of associated parts. Whether it be aluminum housings or terminals, employees of the Apparatus shop turn out thousands of individual parts each week for assembly into such products as cable terminals and central office connectors.



A highly skilled solderer adjusts fine, detailed connecting tips.



A colored light test panel helps provide a quick check on a telephone apparatus connecting block.

Die cast employee feeds oven used to melt down metals required in the manufacture of housings for cable terminating and splicing devices.





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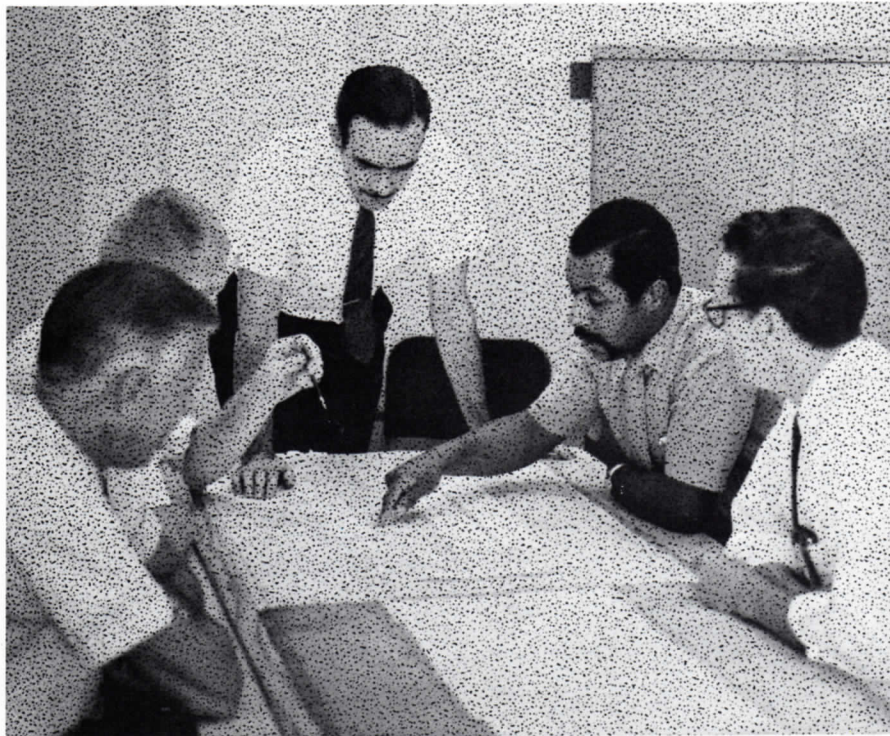
G ENGINEERING...

Western Electric Engineering

Western Electric engineers provide vital advances in telephony to meet new and expanded communications services for the nation.

Engineers utilize their knowledge, experience and techniques to develop new products, materials and manufacturing processes for the complex network of the Bell System. An integral part of engineering is the company's cost reduction effort. By continued examination of products and manufacturing operations, engineers introduce improvements which save the Bell System millions of dollars yearly. This helps to insure quality products at reasonable cost to customers.

Among other functions, the Engineering organization coordinates and equips the plant with all the facilities and services necessary to manufacture telephone products. Engineers also help to establish wage incentive rates, assist Purchasing in developing sources for materials needed, and collaborate with engineers at Bell Telephone Laboratories to implement improved product designs.



Whether he is discussing manufacturing design, above, or testing cable equipment, the engineer helps the nation stay in touch with itself by telephone communications.





ANOTHER VIEW

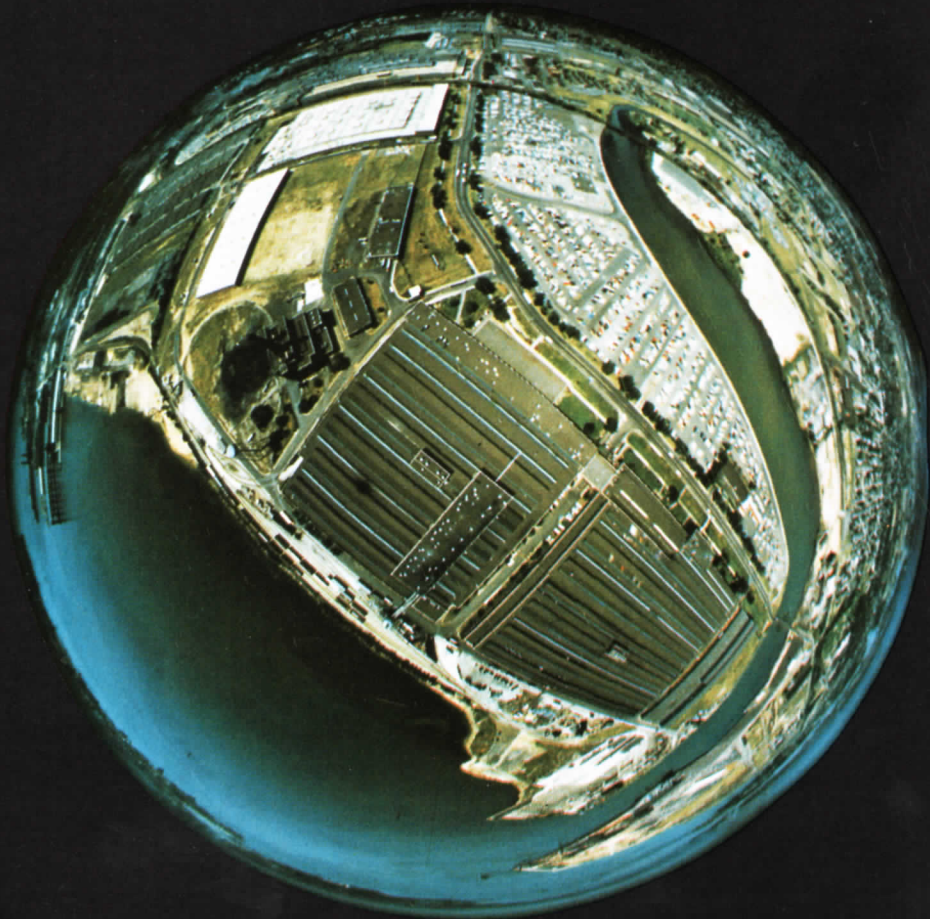


W OF BUSINESS...

A special 360 degree camera lens captures Western Electric's Baltimore Works as a world in itself. Within the 168 acres there are 2½ million square feet of floor space in five major buildings devoted to manufacturing operations.

The plant's parking area alone can accommodate more than 3,000 vehicles and the company has a continuous three-fourths of a mile frontage on Broening Highway. For transporting materials, the company owns a fleet of 22 trucks, runs a railroad over 6 miles of track and maintains 3½ miles of roadway within the plant grounds.

The Baltimore Works uses more than 135 million kilowatt hours of electricity to power round-the-clock production schedules. Manufacturing operations consume some 735 million gallons of water annually. Through continued recirculation of this water, over 4.1 billion gallons are made available for production reuse each year.



Auditing

The Auditing group monitors the basic integrity, cooperation and teamwork of all organizations at the Baltimore Works. With residency at Atlanta's Southern Regional Engineering Center, Auditing also serves the Buffalo Plant, the Eastern Regional Engineering Center in Cockeysville and 10 service centers. A continual inspection of record-keeping techniques assures that employees and suppliers are paid promptly and properly.



Comptroller

The Comptroller's organization is responsible for bookkeeping, accounting and disbursements as well as business methods, payroll, wage incentive review, data processing, and computer operations. Computerized services provide many departments with accelerated information on budgets, inventories and production costs. This data is then analyzed by the interested group and used to obtain efficient and economic operating results.

Payroll

Over 7,500 employees and more than a \$70 million payroll provide a powerful economic stimulant to Maryland each year. Through data processing, the payroll people prepare tailor-made employee pay details. After standard deductions, employees may authorize Payroll to put aside additional amounts of pay for savings bonds, savings plan, credit union, United Fund, union dues or insurance.

Industrial and Labor Relations

This multi-purpose organization is responsible for employee relations. People are—hired, placed, trained and upgraded in jobs; protected at work by an extensive safety program; informed about the business and fellow employees in company publications; rewarded for personal expression through a cash-paying suggestion system; and provided broad medical coverage and retirement security in a comprehensive benefits program.




A well-developed interview is the first step for a person applying for employment.

Purchasing

Western Electric's Purchasing organization not only buys raw materials for the company's manufacturing operations but thousands of supply items from paper clips to telephone poles for the Bell Telephone companies. In recent years skilled buyers at the Baltimore Works have spent nearly \$35 million annually with some 1,300 small Maryland suppliers.

Merchandise

Merchandise is the middleman of supply and demand at the Baltimore Works. Merchandisers plan production according to demand and keep the company's 36 service centers supplied on schedule. Merchandise receives and stores Manufacturing's finished products. As orders are placed with the service centers by the 24 Bell Telephone companies, the Merchandise group at Baltimore ships the equipment to the centers for distribution.



The Merchandise building houses products to be shipped to Western Electric Service Centers across the nation.

Plant Protection

Guards and firemen are constantly drilled for use as protectors of the Baltimore Works and its people. The Plant Protection team maintains its own equipment which includes two firetrucks, jeep pumper, ambulance, 2,500 fire extinguishers and a complete telephone emergency alarm system. Guards patrol buildings, grounds and gates on a 24-hour basis.

Medical

The Medical organization administers first aid for on-the-job accidents and sickness, and examinations for prospective and full-time employees. It also sets job restrictions, if necessary, on workers returning from prolonged illnesses. The Medical director has a professional staff of physician/surgeons, registered nurses, laboratory and x-ray technicians and clerical personnel who serve a modern equipped hospital in the Industrial Relations Annex.



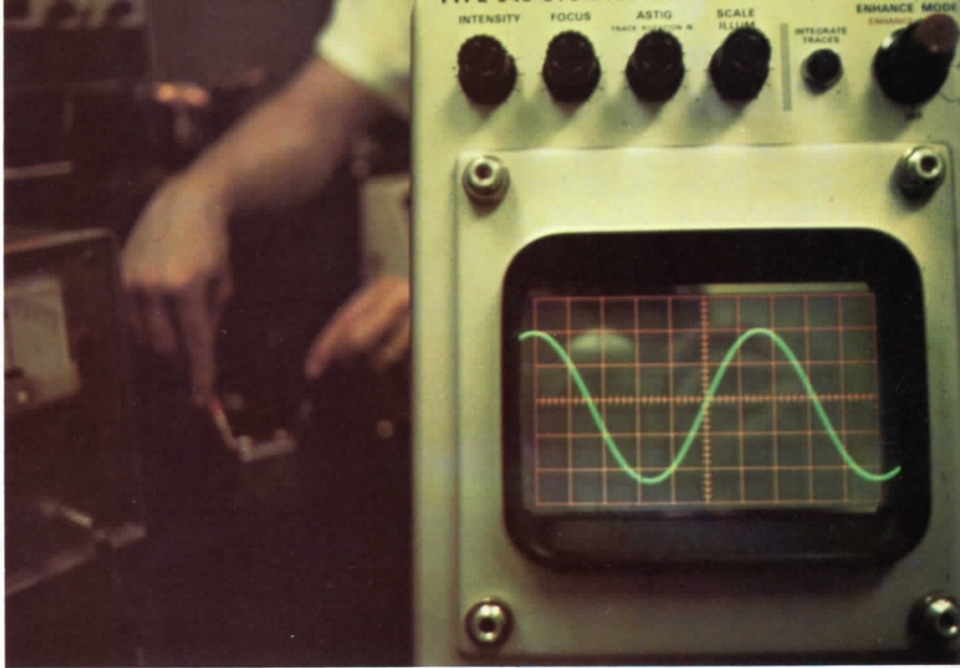
Guard monitors daily movement of all types of vehicles in and out of plant.

Fireman boards one of two fire engines maintained for the plant's protection.



Patents

Protecting company interests by patent has become extremely important in light of numerous engineering developments and cost reduction efforts in the last decade. While filing for a patent, company lawyers submit applications to the U.S. Patent Office in Washington, D.C. Inventions or technical information of significant importance are also filed in foreign countries.



Modern electronic equipment helps Western Electric maintain its high quality standards.

Quality Assurance

Engineers and product quality experts maintain high standards typical of Baltimore Works products through a program of testing and evaluation. This work is performed by employees who report directly

to corporate headquarters in New York. Their job is to assure impartially that Western Electric Company products shipped to customers all over the country meet the Bell System standards of quality.

Transportation

If communications are interrupted, the Transportation group may charter a plane to rush equipment to the problem area. Whatever the route, rate, or carrier, traffic specialists coordinate with economy and efficiency all shipments into and out of the Baltimore Works. The group is also responsible for passenger reservations and the movement of household goods for transferring employees.

Works Service

In meeting company production schedules, the daily maintenance effort must be as flawless and dependable as possible. This requires such skills and trades as electricians, pipefitters, carpenters, machinists, tool makers, and others to keep the plant running without serious delay. The Works Service organization also provides water, heat, air conditioning and other upkeep services.



One of the responsibilities of the Works Service organization is to make weld modifications in manufacturing areas to accommodate equipment.



WESTERN AND T



HE COMMUNITY...



A training program was instituted for people who lack the necessary education or skills for employment.

A Commitment To Equal Opportunity

Western Electric reaffirmed its policy of equal opportunity employment and pledged renewed action by signing the Plan for Progress document in 1961. The "Plan" has produced significant results, but it was obvious from the start that something more had to be done.

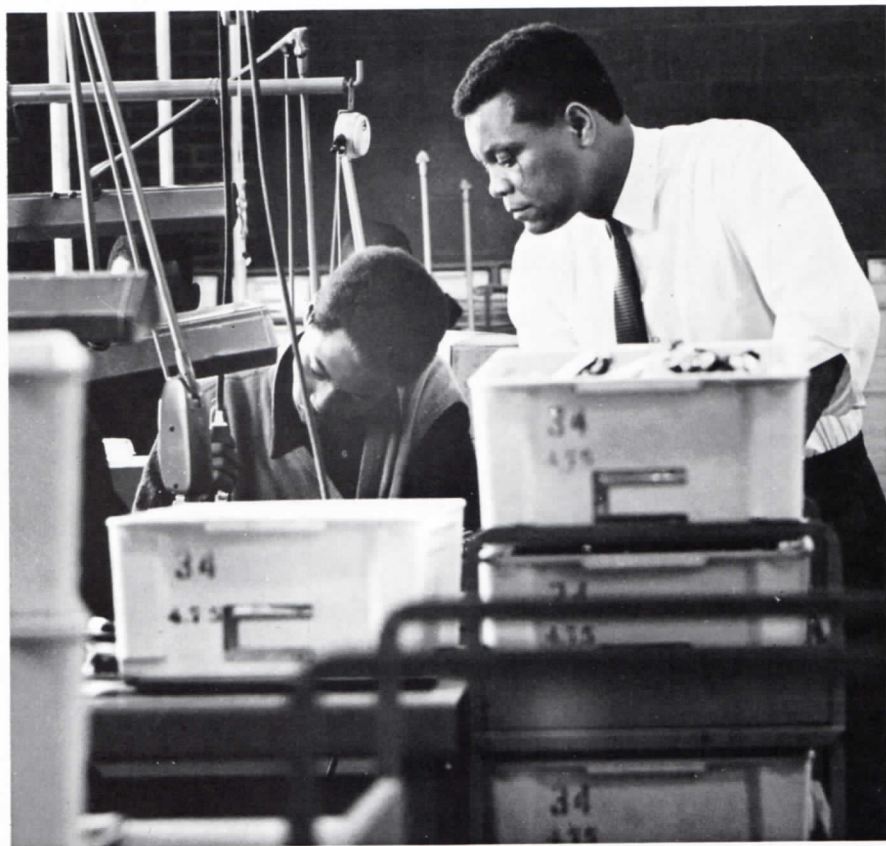
During the summer of 1968, the Baltimore Works instituted a training and employment program for persons who lack education or usable skills to meet minimum requirements for employment. The primary

purpose of the program is to prepare men and women to the point that they can join the regular work force and become responsible partners in the Baltimore community.

Among other actions, the company has joined with industrial leaders through the National Alliance of Businessmen to direct its equal opportunity efforts more effectively. Locally, the company is involved with community action organizations working to improve the employability of the disadvantaged.



"Learners" receive special training and are taught job skills in classroom facility of training and employment program.



New employees are provided man-to-man counseling in order to help them achieve regular industrial work standards.

Telephone Pioneers

The Telephone Pioneers, established in 1911, is the largest voluntary organization of its kind in the world. Membership is open to all persons with 21 years of service in the telephone industry.

Pioneering began at the Baltimore Works with 131 charter members in 1944. The Point Breeze Council became a Chapter in 1962 and now boasts an active membership of approximately 1,800. The Chapter's annual activities include volunteer community service work, hobby show, bull and oyster roasts and a formal annual dinner dance.

Pioneers are so devoted that even retirement will not end their involvement in the telephone business. More than 500 retirees belong to the Life Member Club of the Pioneers. They sponsor such yearly affairs as reunions, picnics, birthday and surprise parties, bingos, boat and bus rides and plant visits. Life Members also volunteer their time and talents to numerous needy community organizations.



Telephone Pioneers gather for their annual formal dinner and dance affair.



Community service Pioneers treat patients of Crownsville Hospital to a picnic and bingo.



Annual Chesapeake Bay oyster roast is a favorite affair of both active and retired Pioneers.



Life Member Pioneer committees meet monthly to direct projects and programs for many retirees.

Point Breeze Club

Working at the Baltimore Works means an employee is automatically a member of the Point Breeze Club. This social, recreational and educational organization is operated and promoted by employees for their entertainment and enjoyment.

From the coronation of a Club queen to a picnic, the social activities offer fun and excitement for all employees. For the athletic types, there is bowling, basketball, golf, softball and many other sports. In addition, PBC members have formed hobby clubs for those interested in photography, stamps and coins, cards, chess and checkers.

General activities include a fishing fair, choral society, Christmas club, family day, ticket service and travel bureaus, dances, Toastmasters and a campers club. Involvement and fun in the Club are free, with occasional fees included to cover costs of major activities.

The Spring Coronation Ball features the crowning of Miss Point Breeze and her court.





Youngsters of company employees, above, are bewildered by antics of Family Day clown, and, at right, frolic on an amusement park ride at Annual Picnic. Below, sport enthusiasts enjoy softball competition through Club organized league.



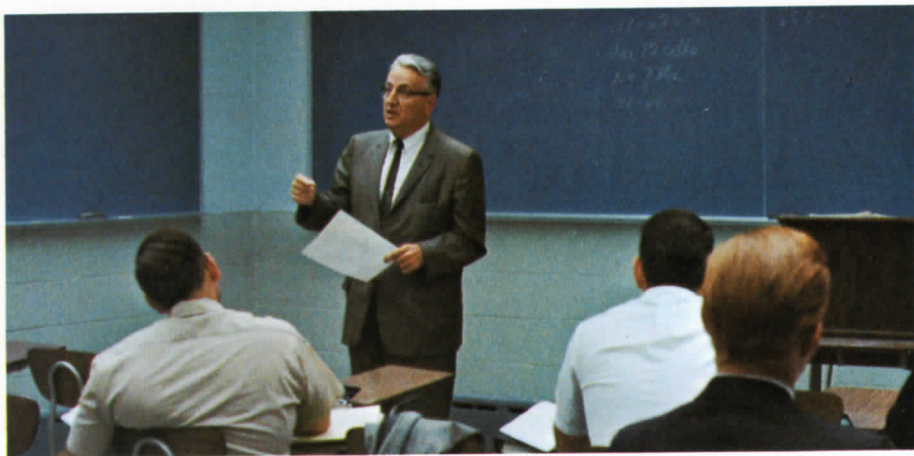
Community Relations

Whatever the community activity — be it chamber of commerce, little league or volunteer fire department — there are Western Electric employees. This civic spirit is conveyed yearly by generous employee contributions to the United Fund. The worthy fund-raising drive provides an opportunity for everyone to participate in the community.

To Baltimore Works employees, sharing in the responsibilities of a

community means teaching night classes, lecturing at high schools and instructing in first aid. They help the handicapped by making tape recordings for the blind and serve as Junior Achievement advisors for high school students. They help their community and themselves by holding political office, and serve as officers and committeemen in professional, civic and service organizations.

When not helping others, employees participate in educational and training programs at work or study after hours in local colleges and universities under the company's Tuition Refund Plan. Under continuing education, many employees are sent to Western Electric's Corporate Education Center near Princeton, New Jersey to learn up-to-date engineering and business management practices.



A Western Electric Quality Assurance engineer teaches statistics at night school.



Employee civic spirit is exemplified each year by generous gifts to the United Fund of Central Maryland.



During the past ten years, Baltimore Works employees have donated nearly 9,000 pints of blood to the Red Cross Bloodmobile program.

W.E. participates yearly in the Chamber of Commerce "Operation Native Son" program designed to acquaint college seniors with industrial employment opportunities in Baltimore.





BELL SYST



EM NETWORK...

WESTERN ELECTRIC

Manufacturer • Supplier • Distributor • Installer

Western Electric is a manufacturer, supplier, distributor and installer of telephone communications equipment used by the Bell System companies. The company also has a major role in the defense activities of the Federal government.

MANUFACTURE

In Baltimore, as in other Western Electric locations (see map), high quality cable, wire, telephones, central office equipment, switchboard transmission equipment and other electronic devices are manufactured.

SUPPLY

Western Electric's Purchasing organization not only buys all raw materials, components and tools for the company's manufacturing operations but thousands of supply items for the operating telephone companies ranging from telephone poles to directories.

DISTRIBUTION

The service centers furnish Western Electric made equipment and supplies to the telephone

companies and replace or repair service worn phone sets and booths, switchboards, and other communications apparatus.

INSTALLATION

The final link between Western Electric-made central office equipment and its successful operation is provided by the company's installation division. Highly skilled and mobile installation crews set up complex switching equipment, test it, and then cut it into service as part of the nationwide Bell System network.

Both the Arctic Distance Early Warning and Alaskan White Alice communication networks were built by Western. Under the nation's manned space program, more than half of the space probes and satellites launched by the United States have been directed by Western Electric Command Guidance Systems. The company was also prime contractor for the worldwide Mercury Communication Stations which have since become part of the Apollo Moon Project.

WESTERN ELECTRIC

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

PRINCIPAL LOCATIONS



The Bell System And Western Electric

AT&T is the parent company and coordinates the operations of the Bell System. Western Electric is the manufacturing and supply unit of the Bell System, and with AT&T, jointly owns Bell Telephone Laboratories. Bell Labs, in turn, performs research and development work for the vast Bell network, while nationwide telephone service is provided by the 24 Bell Operating Telephone companies.

Western Electric owns four subsidiaries:

The Sandia Corporation, which the company operates for the Atomic Energy Commission, is a nuclear weapons research and development facility owned solely by Western Electric since 1949.

Nassau Smelting and Refining Company in New York, acquired in 1931, provides Western with a constant source of copper, lead and other non-ferrous metals needed in the production of communications equipment.

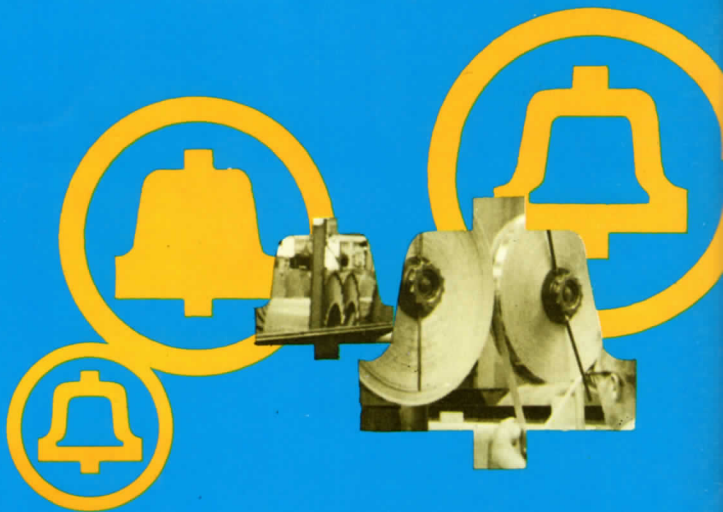
The Teletype Corporation is Western's largest subsidiary and is engaged in the research and production of teletypewriters which send and receive printed messages. The service was introduced in 1931.

Bellcomm Inc., owned jointly by Western Electric and AT&T, was created in 1962 to provide systems planning support for NASA's manned space flight program.





WESTERN ELECTRIC
Western Electric



Western Electric

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