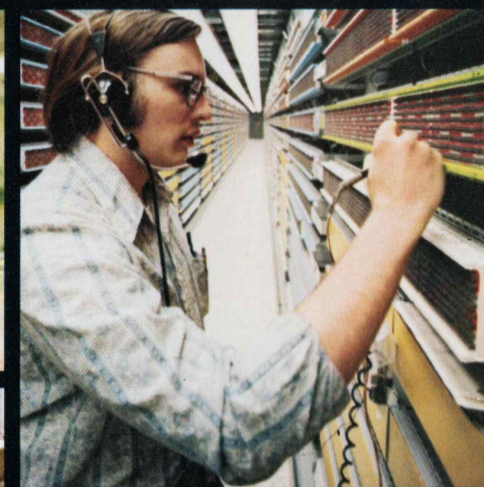
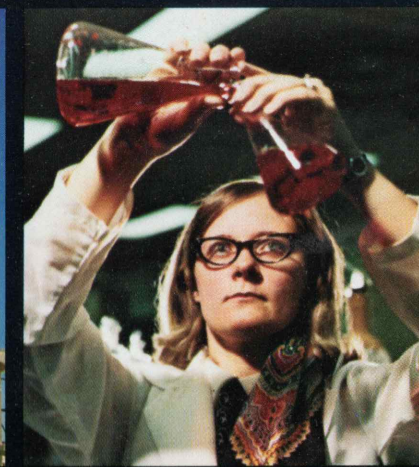


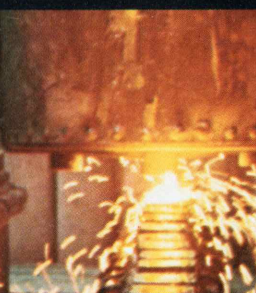


Western Electric

Who
We
Are



What
We
Do



Western Electric

Corporate Headquarters
222 Broadway
New York, New York 10038

An Equal Opportunity Company

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Who We Are...

Western Electric is the manufacturing and supply unit of the Bell System, an association of companies, each separately managed but sharing the common objective of providing communications services to the nation. The Bell System serves approximately 80 percent of the telephones in the United States. A wholly owned subsidiary of American Telephone & Telegraph Company, the Bell System parent, Western Electric is the nation's nineteenth largest manufacturer in terms of sales.* We have more than 170,000 employees who work in nearly every state in the Union, and several foreign countries.

WE makes millions of telephones each year, but that's only one small part of our manufacturing business. Western Electric also manufactures much of the equipment that makes up the telephone network: switching and transmission systems, electronic terminal equipment, electronic components, and cable and wire products.

Managing our diverse line of telecommunications products requires careful coordination from the development stage through production to installation of the finished product. Using information on our customers' needs supplied by our account management teams, product line managers work with Bell Labs to develop new and improved products that will fit smoothly into the telephone network.

Our responsibility for those products does not end at the factory. WE provides systems equipment engineering, installation of switching and transmission equipment, repair, warehousing, and distribution for the Bell System. Western exercises careful control of the involved process that takes equipment from basic research at Bell Labs to our telephone company customers, ensuring high quality and compatibility. Western Electric also purchases supplies and services for the Bell System from other manufacturers. Purchases include items such as telecommunications equipment, computers, power equipment, telephone booths, poles, office machines, and maintenance items.

Through our subsidiary, Western Electric International, and our Government and Commercial Sales Division, we also sell telecommunications equipment and services to other nations and the U.S. Government.

Our fundamental purpose has not changed since we became part of the Bell System in 1881. It is to help the Bell telephone companies provide the finest communications service in the world at a reasonable cost.

What We Were . . .

Western Electric, the nation's largest manufacturer of telecommunications equipment, began as a small model-making shop in Cleveland, Ohio, in 1869, six years before the telephone was invented. Organized as Gray and Barton, the small company quickly developed a reputation for skilled workmanship and innovation that helped it to outgrow the small Cleveland shop in a few months.

The firm moved to larger quarters in Chicago to be closer to its chief customers, the nation's railroads and telegraph companies. One of the original organizers of the firm, Elisha Gray, was a former physics professor and noted inventor who patented an automatic printer for telegraph service and later invented a battery-operated telephone that the new company manufactured in its first experience with telephony. His partners in the firm were Enos Barton, a pioneer telegrapher, and General Anson Stager, a business executive who had been Chief of U.S. Military Telegraphs during the Civil War. General Stager's experience, Gray's inventiveness, and Barton's business acumen combined to make the small firm sought after by inventors, railroads, and telegraph companies as a source of first-quality electrical equipment.

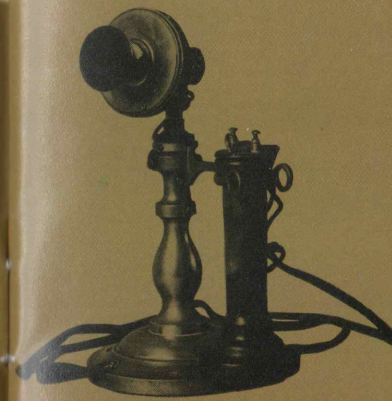
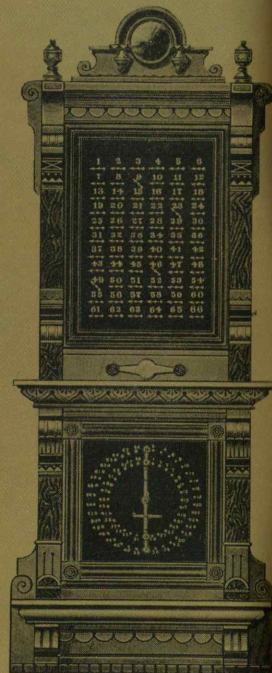
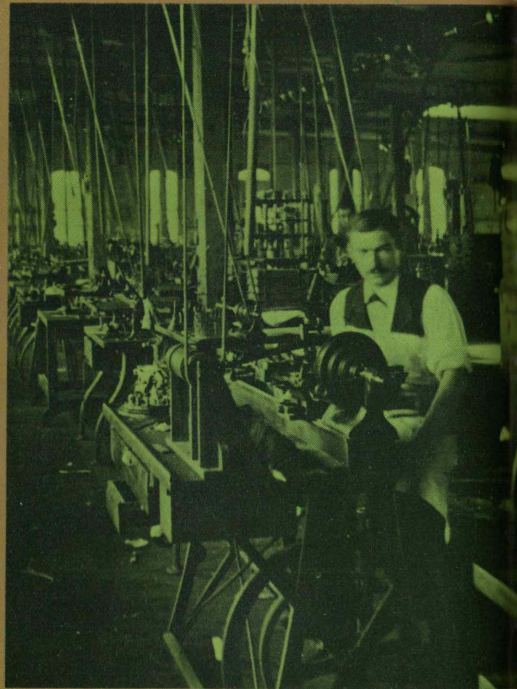
The company had a close call in 1871 when the great Chicago fire was stopped just two blocks from the shop. The firm's efforts during the city's reconstruction after the fire further enhanced its reputation. In 1872, the company was reorganized with additional capital into the Western Electric Manufacturing Company.

By the time of the nation's Centennial in 1876, Western Electric was a leading manufacturer of electrical equipment and took five first prizes at the Centennial Exposition. Another star at the Exposition was 29-year-old Alexander Graham Bell

and his new invention—the telephone. Western Electric's involvement with telephony started a year later when it began producing Gray's instrument.

In 1881, the American Bell Telephone Company (forerunner of AT&T) decided to acquire a major interest in Western Electric to establish it as the primary supplier of its equipment. American Bell was looking for high-quality products that would be compatible with one another and standard throughout its system. On February 6, 1882, Western Electric signed its first supply contract with American Bell and became an important part of the Bell System.

In 1901, Western Electric began centralized purchasing, distribution, and repair functions for the Bell Telephone Company of Philadelphia. The arrangement proved so successful that similar agreements were signed with other telephone companies and Western Electric began its supply role for the Bell System.



Switching equipment could be called the brains of the telephone network. Switching equipment located in a telephone company central office registers the phone number a subscriber dials and performs the complicated steps necessary to connect the two parties. New electronic switching systems (ESS) manufactured by our Switching Equipment Manufacturing Division are performing these functions more quickly, more accurately and with less maintenance expense.

Electronic switching systems vary in size from the big systems designed to handle long distance switching in large metropolitan areas to small systems for rural offices. Modular designs like the No. 3 ESS for rural communities can be pre-assembled at the factory, shipped by truck to the site, and slipped into place. Modular designs save time and money in the installation of the system.

The electronic systems, which now account for most of the production of the division, use computer-like stored program control which contains the instructions for the equipment. It also performs self-diagnostic maintenance routines. The stored program control can be easily modified as the central office grows. Electronic switching allows the telephone companies to offer a number of new features such as call forwarding, call waiting, and three-way calling.

At the Columbus Works, the division is producing equipment for a new, faster way of setting up long distance calls. The system, called Common Channel Interoffice Signaling, allows the telephone companies to offer new features for toll calls such as automatic call back on busy signals, call screening for high priority calls, and automatic collect calls from predetermined numbers.

The division has five principal manufacturing locations: Lisle and Chicago, Illinois; Oklahoma City; Dallas; and Columbus.

A Network Software Center is under construction in Lisle for the development of ESS generic software needed to operate increasingly sophisticated telecommunications equipment.

Switching Equipment

AT THE CENTER OF THE TELEPHONE NETWORK



Top: The No. 1 Electronic Switching System (ESS) is manufactured in Dallas. It is designed for big city central offices serving up to 130,000 telephones.

Above: Frames for the No. 4 ESS are being wired in Lisle, Ill. The No. 4 ESS's ability to process 550,000 long distance calls per hour will mean fewer switching offices to meet the increasing toll call needs in large metropolitan areas.

Bottom Right: A telephone company craftsman operates the console of this electronic translating system which permits Common Channel Interoffice Signaling—a new high speed way of making long distance connections.



Transmission equipment converts or controls voice, data, and television signals in order to send them over wires or through the air without distortion or masking by noise. Our Transmission Division has three manufacturing locations: the Merrimack Valley Works in North Andover, Massachusetts; the North Carolina Works in Burlington and Winston-Salem; and the Richmond Works in Virginia.

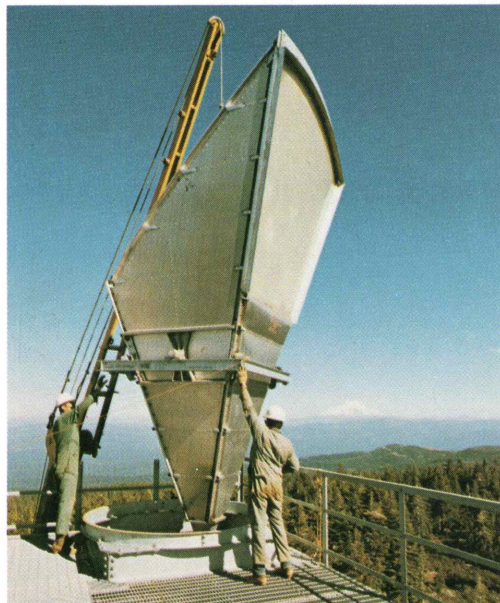
Merrimack Valley since 1956 has been a leader in the production of cultured, or synthetically grown, quartz used for filters and oscillators. New transmission equipment manufactured at Merrimack Valley is providing almost noise-free transmission through pulse-code modulation technology. These systems, such as the D4 Channel Bank, convert analog (voice) signals into a digital code. The code signals can be regenerated as they are transmitted so there is almost no distortion when the signals are reconverted to voice signals.

Digital transmission systems for the lines connecting telephones to the central office are manufactured at the North Carolina Works. These subscriber loop carrier systems put up to 96 conversations on either two or four pairs of wires, depending on the application, producing significant savings for the telephone companies by reducing the need to lay new cable.

The Richmond Works produces printed wiring boards, an important component in transmission equipment, but also used by all the other manufacturing divisions.

Transmission Equipment

OVERCOMING THE PROBLEMS OF DISTANCE



Top Left: An engineer at the Richmond Works examines an artmaster created in two minutes by the Laser Artmaster Generator in rear. The old method took 8 hours.

Bottom Left: Microwave equipment overlooks mile-high Bear Spring Ridge in Northern California. Microwave towers like this one carry voice, data, and video signals across the country.

Bottom Right: Echo canceler chips are incorporated into this complex assembly at our Merrimack Valley Works.

Above: A C&P Telephone Company cable splicer checks the operation of a subscriber loop carrier system which increases transmission capacity by putting more conversations on each line.

In telephone company terms station equipment refers to telephones, switchboards, consoles, and other switching apparatus located on the customer's premises. This diverse group includes everything from the Princess® telephone that fits on a bedside table to the Dimension® private branch exchange (PBX) systems that are capable of switching calls for more than 2,000 telephones for a large corporation.

Residence phones have come a long way since the days of all black dial desk phones. The phones WE makes today are lighter, more compact, and more attractive than ever before. They have illuminated dials and Touch-Tone® push-button dialing. Design Line* models will complement any decor. Advances in technology such as light-emitting diodes and flexible printed circuits have been incorporated in the popular Touch-Tone Trimline® phone. These handsets are light and reliable and the light-emitting diodes that provide illumination will last more than 20 years. Modular designs with plug-in cords have made installation and repair much simpler.

For the business customer, our products vary from electronic push-button phones to computer-like private systems to fit the needs of any size business. For small to medium size businesses ComKey* systems, ranging in capacity from 16 to 72 telephones, provide many modern call-handling features. For larger businesses and institutions there are Dimension private branch exchange systems. These systems use computer-like stored program control housed in a cabinet on the customer's premises to handle the switching of calls and perform self-diagnostic maintenance routines. The flexible memory of instructions in the stored program control allows the customer to add options to the telephone system as the business grows. Because the system uses magnetic tape, changes are made without costly and time-consuming rewiring. The Horizon® communications system brings many of the Dimension PBX features to businesses with from 20 to 80 telephones.

The Station Equipment Division also produces sets for Dataphone® service which transmit data on telephone lines. The division has plants in Denver; Indianapolis; Shreveport, Louisiana; Kearny, New Jersey; and Aurora, Illinois.

Station Equipment

PHONES FOR EVERY COMMUNICATIONS NEED



Top and Center Left: These Design Line* phones for residences, the ultra-sleek Sculptura® telephone and the nostalgic Americana Edition Wall Telephone (circa 1882), are just two of the varied styles we produce. They use modern components to ensure high quality voice transmission and reception.

Bottom Far Left: This mighty little ComKey 416 set is the smallest of our business key systems. It allows businesses that need as few as four lines to have some of the sophisticated call handling features of the larger business systems.

Left: At our Indianapolis Works, employees work on assembly of our Trimline telephones.

Above: Final tests are conducted on consoles for Dimension private branch exchange systems at our Denver Works.

Electronic components are those mysterious, seemingly magical devices that do much of the work in electronic telephone systems. These devices, such as transistors, integrated circuits, and light-emitting diodes, are highly sophisticated—sometimes with thousands of microscopic elements. Electronic components form the building blocks used by the other WE manufacturing divisions in the production of their products. The Electronic Components Division has manufacturing locations in Allentown and Reading, Pennsylvania, and Kansas City, Missouri.

A steady stream of new electronic technology continues to flow from Bell Labs design into WE products. Branch units of Bell Labs at Allentown and Reading work closely with Western Electric, developing production techniques. It was at Allentown in 1951 that WE manufactured the world's first production transistors.

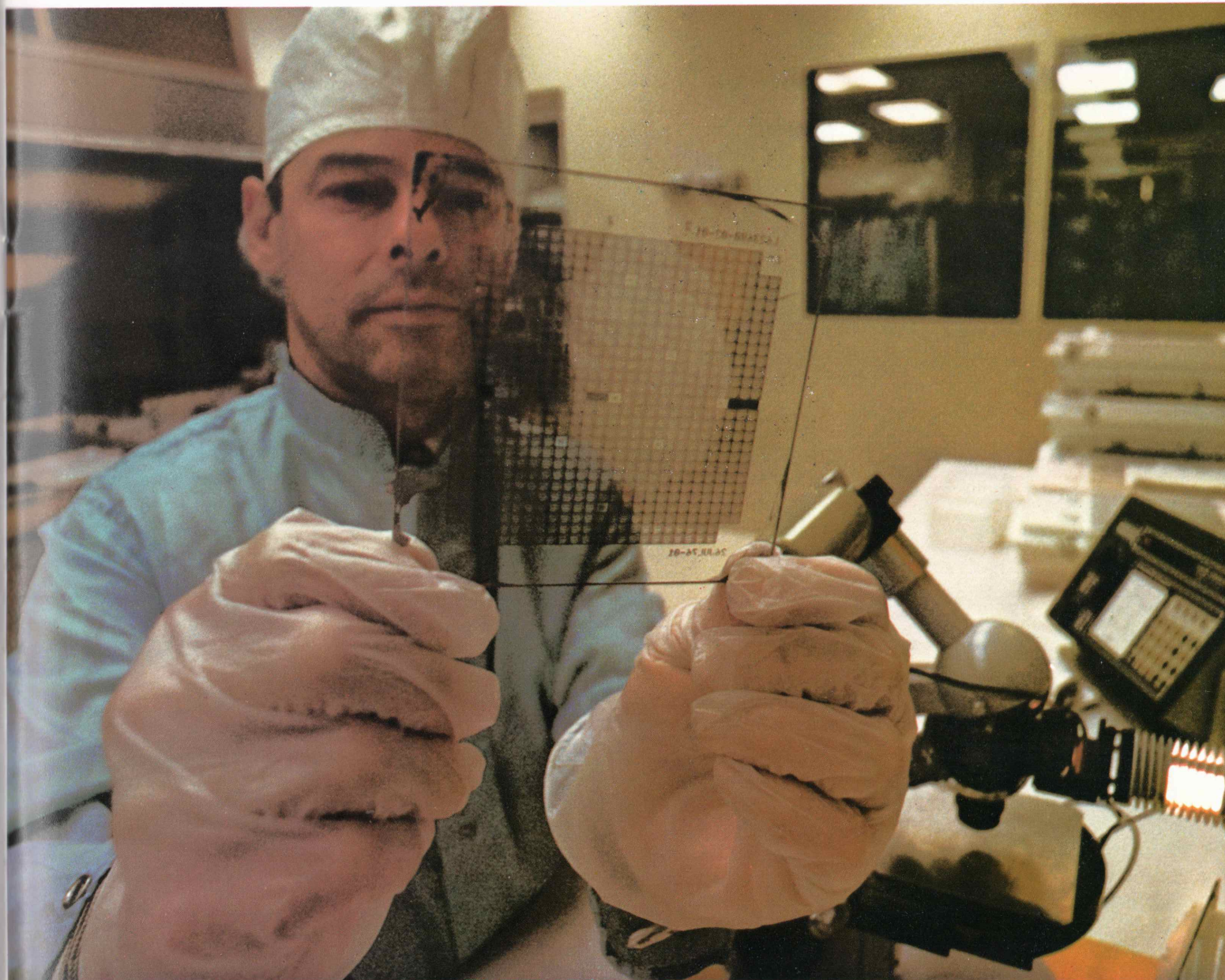
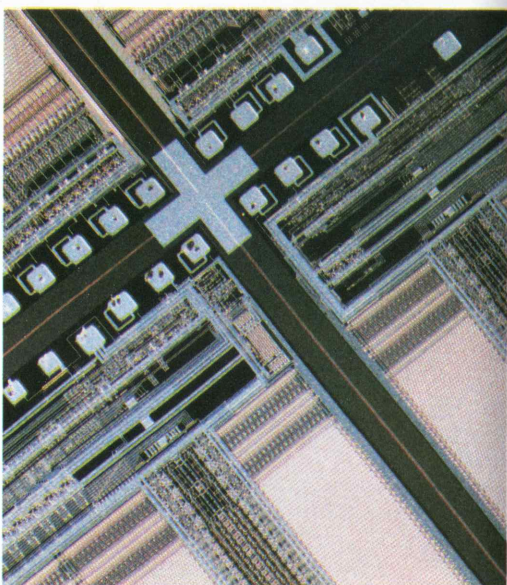
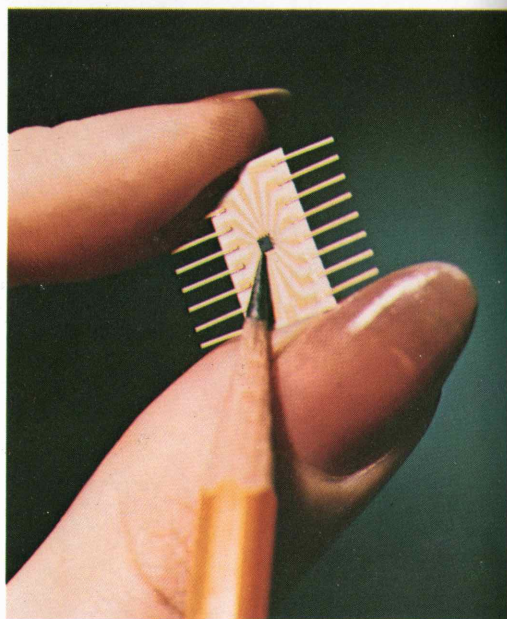
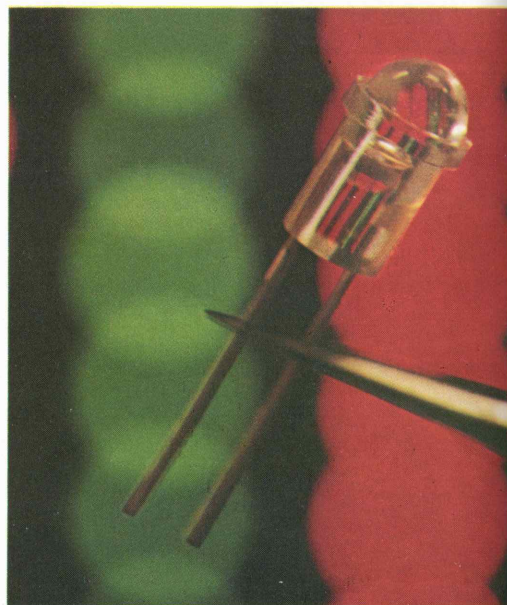
Among the newer electronic products is the 64K random access memory microprocessor being manufactured at Allentown. The heart of this device is a silicon chip one tenth the size of a postage stamp. Capable of storing 65,536 bits of information, the device has four times the capacity of its predecessor, yet fits in a similar size package. The result is a cost saving for the electronic switching and other communications systems where the new device is used.

The Reading Works makes a wide variety of integrated circuits, as well as under-sea cable repeater components that, because of their high replacement cost, must work perfectly on the ocean bottom for a minimum of 20 years. Kansas City Works manufactures such devices as transistors, diodes, electron tubes, and relays. Kansas City also produces connectors and thick film devices.

In the microscopic world of electronic components, production techniques are often as interesting as the new products themselves. One technique, called EBES, (electron beam exposure system), uses a computer-controlled beam of electrons to scribe minute patterns needed in semiconductor production. EBES is faster and more accurate than the old technique.

Electronic Components

POWERFUL LITTLE BUILDING BLOCKS



Top Left: Light-emitting diodes are produced in Reading. The diodes will eventually replace conventional filament lamps because they are smaller, more reliable, and use less power.

Center Left: Integrated circuit chips like this one are manufactured in Allentown and Reading. Each contains thousands of transistors and other electronic components.

Bottom Left: A very close look at sections of 64K random access memory semiconductors before separation. They store and give access to large amounts of information in fractions of a microsecond.

Above: A supervisor in our Allentown Works clean room inspects chrome masks used in silicon integrated circuit production. The intricate patterns are scribed by an electron beam.

Cable and Wire

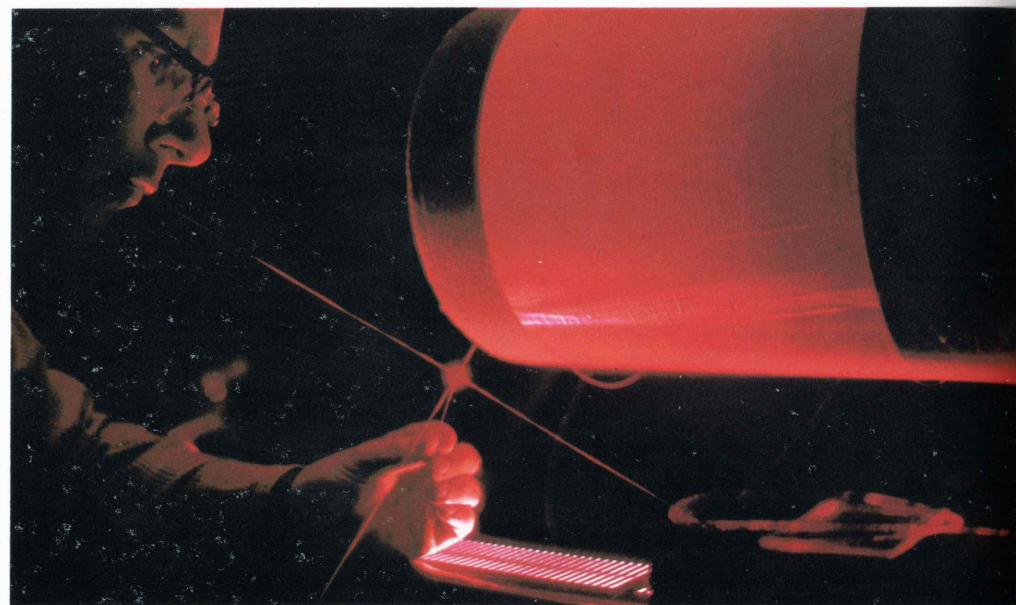
LINKING THE NATION'S PHONES

A staggering amount of cable and wire connects Bell System telephones and central switching offices. Each year Western Electric's Cable and Wire Division manufactures almost 400 billion conductor-feet of cable and wire, or nearly enough to stretch from the earth to the sun.

Five major product groups are turned out by the Cable and Wire Division: *exchange cable* is the thick, multi-conductor cable used to connect telephone central offices with each other and with major business and residential centers; *switch-board cable* is a smaller, multi-wired cable used within central offices; *coaxial cable* is used for television and high frequency telephone transmissions. The fourth group includes *ords* and *wire* for individual phones and smaller wiring applications. Finally, there is *loop transmission apparatus*, a family of products such as connectors, cabinets, and protectors, that complete the system from the central office to the telephone user.

Four major plants—in Atlanta, Baltimore, Omaha, and Phoenix—make up the Cable and Wire Division. WE also operates a cable-making shop at its plant in Chicago. Atlanta holds the world's record for producing the most cable in a single year, more than 123 billion conductor-feet of cable and wire. It is the newest of WE's cable plants and, with nearly 1.7 million square feet of floor space, is physically the world's largest cable facility under one roof. It includes a branch unit of Bell Laboratories to aid introduction of new developments as well as a product line planning and management organization.

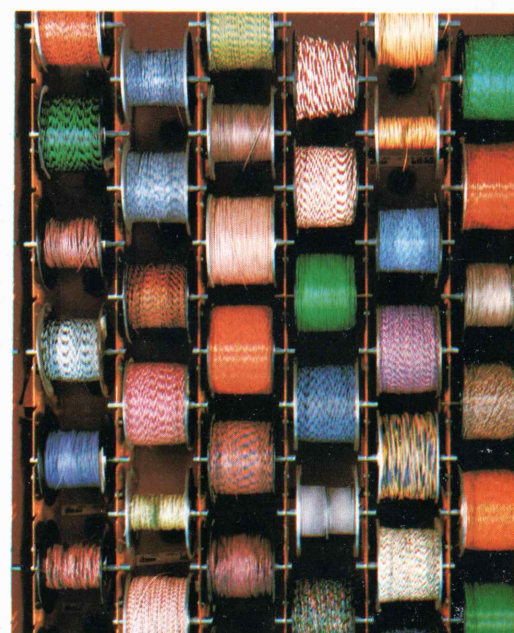
In Atlanta we are making a new kind of cable to facilitate a radically new method of transmitting signals—on pulses of light. Composed of hair-thin fibers of purest glass, these cables—called lightguides—carry far more voice, data, and video signals than conventional cables, and take up much less space.



Top Left: A WE engineer demonstrates lightguide cable. This revolutionary cable made of superfine glass uses concentrated light from a laser to carry voice, data and video signals.

Bottom Left: These spools of copper wire being prepared for pulp insulating at Atlanta are moved on a cushion of air because of their weight. The wire will later be made into exchange cable and used to connect central offices.

Center: Cable is stored and ready for shipment to Bell telephone companies from this reel yard near Atlanta.



Top Right: Lightguide cable being manufactured at the Atlanta Works.

Bottom Right: A rack of wire spools in one of our warehouses shows just a few of the many varieties of wire produced by the division.

Engineering

KEEPING **WE** AHEAD
IN TECHNOLOGY

This division provides leadership in stimulating research and development in all fields of WE engineering activity: manufacture, equipment engineering, distribution, installation, and repair of products.

An important responsibility of this division is Corporate Product Line Planning and Management. Our products are designed by Bell Labs, manufactured by one of our manufacturing divisions, and distributed by the Bell Sales Division to the telephone companies. In each of the five manufacturing divisions and in purchased products there is a product line planning and management organization which supervises the products within that division from development through distribution. The Corporate Product Line Management group is responsible for overall coordination to ensure that products from the different divisions are compatible with the telephone network and meet the customers' needs. The planning group interacts with account management teams from the Bell Sales Division to learn what new products are needed and whether our current products are efficiently fulfilling their function.

The Engineering Division also coordinates our Quality Assurance Program, which has inspectors checking that our products meet the standards established by Bell Labs. In order to maintain objective evaluations, these inspectors report directly to the corporate quality assurance organization and not to the local management at the plants where they work.

In a similar fashion Corporate Engineering monitors the administration of the wage incentive program by each manufacturing location to ensure fairness and consistency.

Other responsibilities include collaborating in plans for acquiring, leasing, and developing company facilities. The division evaluates and verifies company-wide cost reductions, which exceed \$200 million annually. An energy management program monitors energy use at all company locations and promotes energy saving.

Engineering consultation and overall program guidance are provided to all locations for pollution control and safety matters.

Western Electric's Engineering Research Center near Princeton, New Jersey, spurs development of more efficient and economical manufacturing processes. Innovations from the Research Center include industrial applications of the laser and a technique for sensing minute abnormalities in ceramics by the sounds emitted during processing.

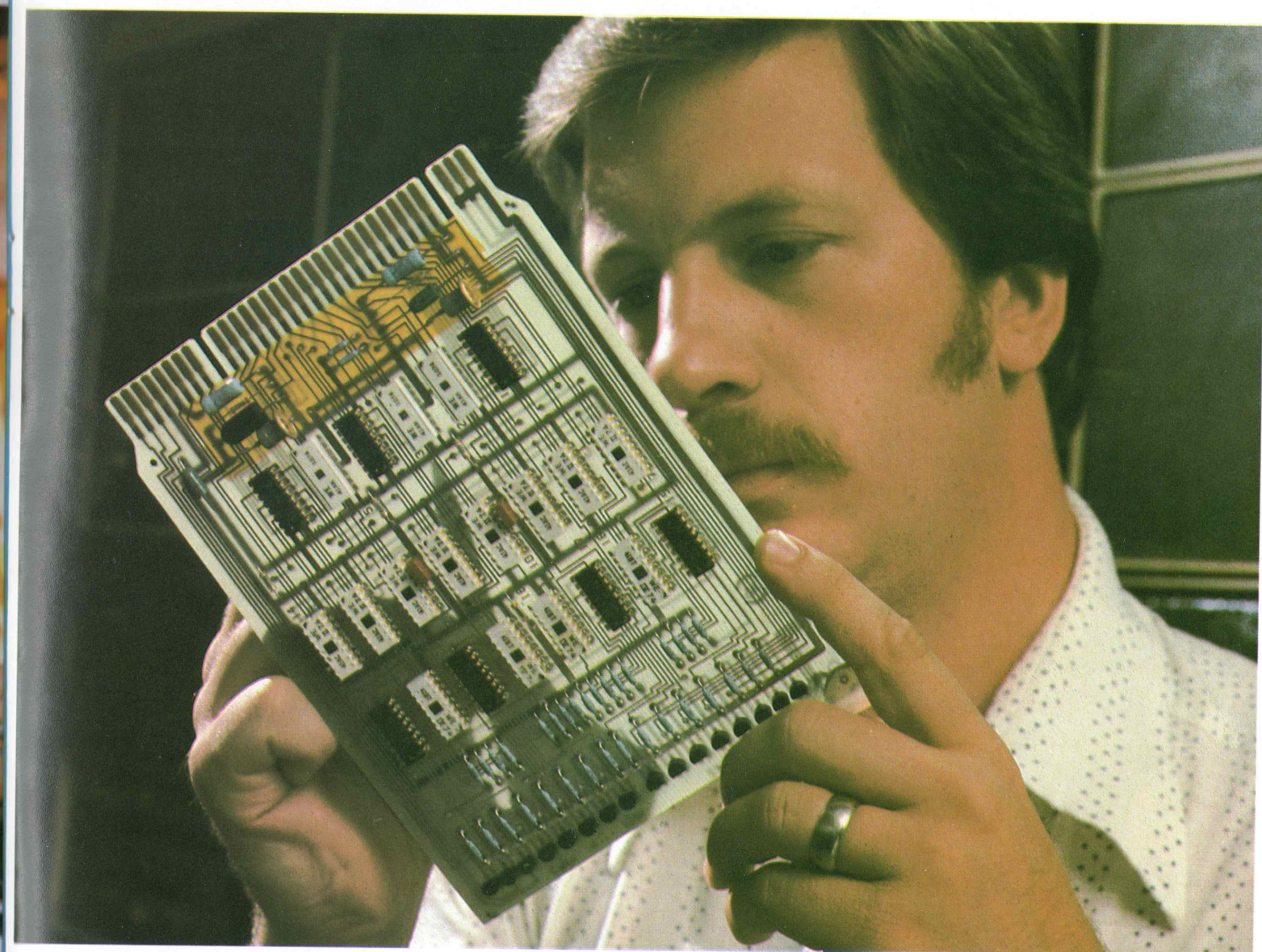


Above: At our Engineering Research Center, an engineer holds pellets of plastic reclaimed from the jackets of telephone wires. The technique for recycling this type of plastic was developed by Western Electric.

Top Right: One of the many types of digital printed wiring boards to which automatic diagnosis has been applied.

Right: An engineer conducts electron spectrometric surface analysis.

Far Right: Graphics software for an Automated Publications Support System being tested.





WHERE WE WORK

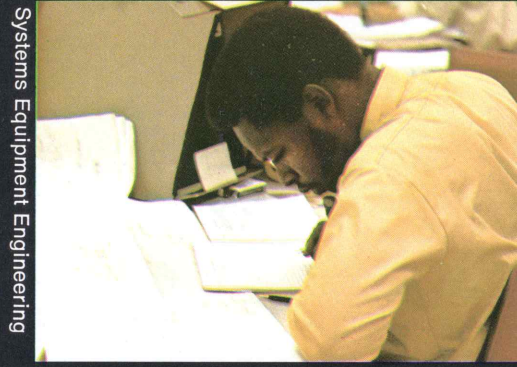
- ⊛ GENERAL HEADQUARTERS
- MANUFACTURING LOCATIONS
- ▲ SERVICE CENTERS
- △ DISTRIBUTION CENTERS
- ★ MATERIAL MANAGEMENT CENTERS
- INSTALLATION AREA OFFICES
- REGION HEADQUARTERS
- * SUBSIDIARIES
- ENGINEERING RESEARCH CENTER
CORPORATE EDUCATION CENTER
- ◎ BELL SALES DIVISION TRAINING CENTER
- ☆ GUILFORD CENTER
CORPORATE ADMINISTRATION
GOVERNMENT & COMMERCIAL SALES
WESTERN ELECTRIC INTERNATIONAL
- △ SOUTHGATE OFFICE BUILDING
OPERATING VICE PRESIDENTS
- † PURCHASED PRODUCTS ENGINEERING AND INSPECTION
- ‡ SWITCHING SOFTWARE CENTER



PRINCIPAL LOCATIONS

Serving Our Bell System Customers

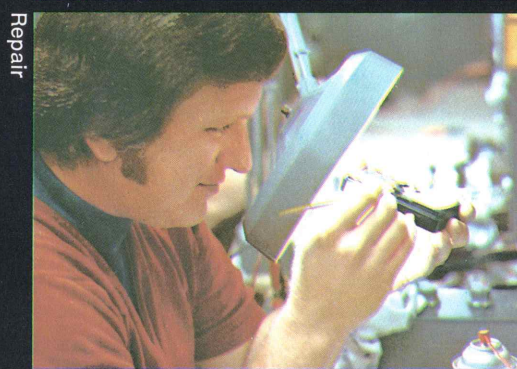
Responsibility for our products doesn't end when they leave the factory. The three divisions that are our link with our Bell System customers—Material and Account Management, Bell Sales-East, and Bell Sales-West—make sure our products are delivered, installed, maintained, and used for maximum efficiency. These divisions report to the Executive Vice President, Bell Sales.



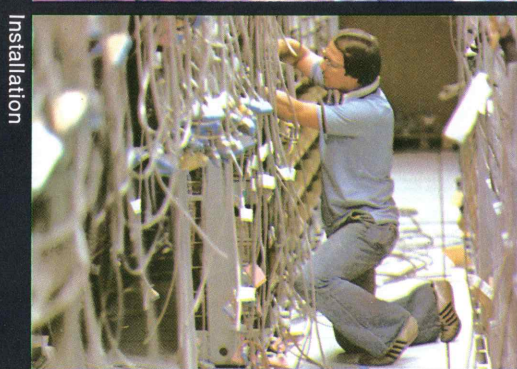
Systems Equipment Engineering



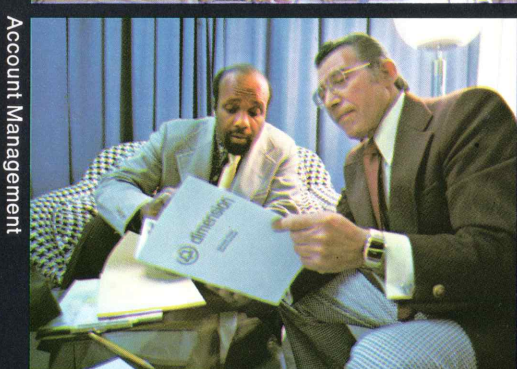
Warehousing



Repair



Installation



Account Management

Material and Account Management

The purpose of the Material and Account Management Division is to ensure that our products and services are delivered to our customers as smoothly and promptly as possible. There are four principal organizations within the division working to fulfill that goal.

Material Planning and Merchandise forecasts the demand for our products, places orders with our factories, and controls nation-wide stocks to maintain adequate supplies to meet day-to-day Bell Sales regional requirements in support of customer needs. In each of the seven Bell Sales regions the division controls and maintains stock in a Material Management Center with large quantities of equipment and supplies for the company's business.

The *Corporate Account Management Organization* develops the plans and support for the Regional Account teams. *Corporate Account Management* also prepares brochures, handbooks, and subscriber instruction booklets on our products.

The *Pricing Organization* establishes prices consistent with our pricing policies.

The *Contracting Organization* administers and interprets our standard supply contracts with all of the Bell telephone companies.

Bell Sales

The Bell Sales function is divided geographically into two divisions: Bell Sales-East, and Bell Sales-West. The two divisions are our primary point of contact with the Bell telephone companies. Through Regional Account Management Teams we assist the telephone companies in planning applications for WE products and services. Our Account Representatives are also responsible for identifying and reporting back to Western new and emerging telephone company needs, as well as demand for our existing products and services. The Regional Account Teams, working with the Product Line Planning organizations, develop marketing strategies and tools designed to meet the needs of the operating companies.

Bell Sales also handles the functions of Systems Equipment Engineering, Warehousing, Repair, and Installation which are described on the following pages.

There are a total of seven Bell Sales regions with regional headquarters in Newark, New Jersey; Cockeysville, Maryland; Atlanta, Georgia; Rolling Meadows, Illinois; Ballwin, Missouri; Aurora, Colorado; and Sunnyvale, California.

Bell Sales

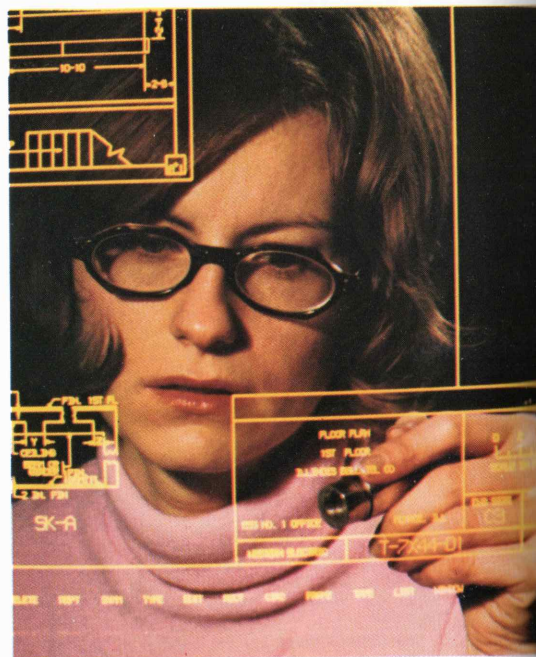
Systems Equipment Engineering

When a company sells a simple piece of electrical equipment, the consumer needs few instructions to use it properly. When Western Electric sells complicated equipment like a major switching system, things get a lot more involved. Our systems equipment engineering group is responsible for tailoring each major order for WE equipment to meet the exact needs of the customer.

In seven regional centers around the country, engineers, draftspeople, and specification detailers assist our customers in ordering our equipment. Systems equipment engineers are considered the architects of the network. They ensure that new equipment is compatible with existing equipment and will fill the particular need. They have few orders that are alike because telephone central offices and transmission centers vary in size and configuration, but all new equipment must mesh into the network.

When an order is placed, the systems equipment engineer determines precisely what equipment is needed for that job. Before the equipment is ordered from a WE plant or an outside manufacturer, exact specifications for cabling and power equipment must also be prepared and blueprinted so our manufacturing people can make the components and our installers connect it smoothly and quickly into the network.

Systems Equipment Engineering handles about 70,000 jobs a year for the Bell companies, and, in the process, writes job specifications on some 350,000 orders to our plants. When the installations are fully completed, the official circuitry records are retained so future alterations and additions can be made easily.



Top: Systems equipment engineers at the Northeastern Region Headquarters in Newark help in designing or expanding Bell System central offices and transmission systems. Each of seven regions has systems equipment engineers who perform this function for the local Bell companies.

Bottom: At the Central Region Headquarters in Rolling Meadows, Illinois, a draftsman uses a computer graphics machine to prepare telephone central office plans.

Bell Sales

Warehousing

The standard supply contracts that Western Electric has had with the Bell telephone companies for more than 70 years stipulate that our company "shall exercise due diligence in maintaining at all times a reasonable stock of materials" to meet their needs. To meet these varied needs, WE stocks items as diverse as cable reels and transistors.

Western's nation-wide supply and distribution system produces savings for the operating companies in inventory and investment costs. The company operates some 50 facilities in all parts of the country to ensure that these stocks are available quickly and in sufficient quantity.

In each of the seven Bell Sales regions there is a material management center. These large warehouses have up to 800,000 square feet of warehousing space—equal to about 15 football fields. These centers maintain back-up stocks to minimize our shipping costs between widely separated areas, hold emergency supplies, and act as control points for equipment slated for central office installations.

At our service centers warehousing and repair facilities are usually housed under one roof. A typical service center stocks 16,000 different kinds of items needed in the daily operation of the Bell telephone companies. Distribution centers are smaller warehouse satellites strategically located to shorten delivery time.

Stock levels are adjusted with demand, seasonal requirements, availability of material, and the length of time needed to replenish the stock. Most orders are shipped out within 24 hours.



Top: In the foreground is part of the fleet of specialized material-handling vehicles used at a material management center located near Council Bluffs, Iowa.

Bottom: Warehousing facilities like this one at the Ballwin, Missouri, service center are part of a nation-wide network of some 50 service centers and other warehousing locations through which Western Electric can quickly supply the Bell telephone companies.

Bell Sales

Repair

Repairing used telephones and equipment to look and work like new saves money and materials. We recondition more than 32 million telephones each year—more than twice as many as we manufacture. Our repair shops are part of a nation-wide network of recycling operations geared to keeping telephone rates down through conservation and reuse of resources.

At 31 service centers and at our Communications Products Center in New York City, employees repair and refurbish telephone equipment valued at more than \$900 million per year. If the equipment is so service-worn as to be irreparable, it is scrapped and all salvageable metals—such as gold, silver, copper, and zinc—are sent to our subsidiary, Nassau Recycle Corporation. There, these metals are reclaimed for use in our manufacturing or for sale to other companies. The telephone companies receive credit for the material they return.

Our engineers have also developed techniques for recycling the plastics used for telephone housings and cable jackets. Recycling plastics has become increasingly important as the cost of petroleum, the raw material for plastic, has risen.



Above: An employee at the Communications Products Center in New York operates a pre-analyzer machine which detects and pinpoints defects in telephone sets that the Bell telephone companies return to WE for refurbishing.



Left: Employee at the Miami Service Center tests a coin collector on a pay phone. Western Electric reconditions more than 32 million telephones each year.

Bell Sales

Installation

Our company maintains a skilled, mobile force of men and women to install major pieces of telephone equipment. These installers usually work in telephone company central offices installing switching equipment or other large systems. The installation force is supplemented by clerical and support personnel who work in the district and area installation offices and field operating centers.

The installation force performs over 100,000 separate jobs each year for the Bell telephone companies. They range in size from individual tasks, such as installing several long-distance dialing units in a central office, to large group projects involving the installation of a complete long distance electronic switching system requiring up to 48 weeks to complete.

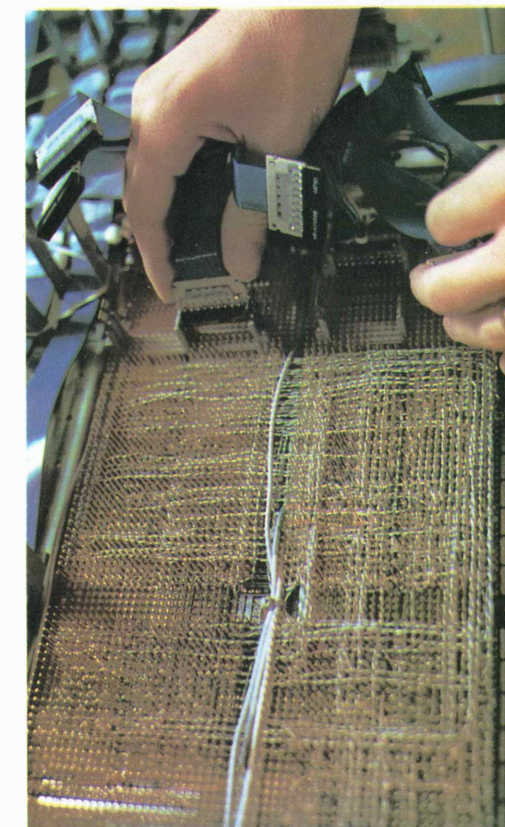
A growing proportion of these installation jobs involves electronic switching systems. New techniques for installing these systems are taught at our training centers. WE installers also put in the traditional crossbar switching systems, private branch exchanges, toll carrier, and radio transmission units. As more prefabricated modular designs are developed, a greater amount of the installers' work will be done in our factories. About ten percent of Western Electric's installation work is performed for the Long Lines Department of AT&T, with most of the rest for the Bell telephone companies. The organization maintains some 36 field operating centers to back up installation forces with materials, test sets, and other supplies.



Top: WE personnel install the first of a new frame system called Cosmic-Cosmos at the Beverly Hills central office. The new system helps maintain order in the maze of wires coming into a central office and helps the telephone companies realize savings in both wiring and clerical costs.

Center: An installer checks the operation of equipment at this 4A Crossbar office in Gardena, California.

Left: New technology has simplified installers' work by grouping conductors in plastic insulated ribbons.



Purchasing and Transportation

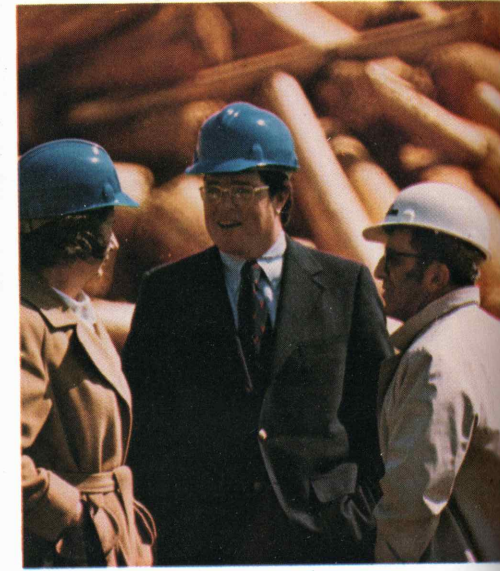
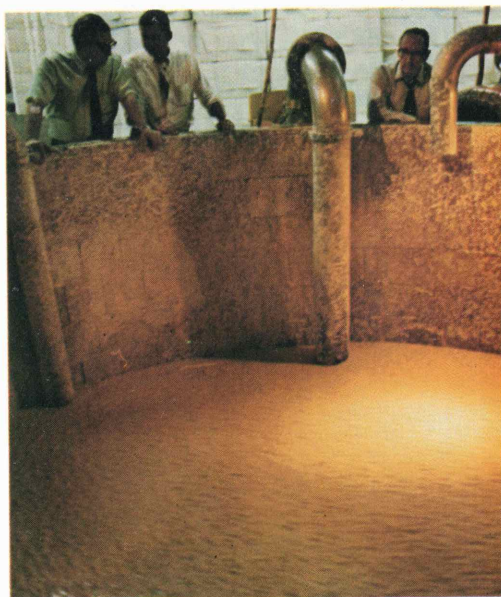
ONE OF THE NATION'S LARGEST CONSUMERS

Supplying the needs of the Bell System makes WE's Purchasing and Transportation Division one of the nation's largest consumers. Each year the division coordinates the purchase of over \$4.5 billion in supplies and services both for our own manufacturing needs and for the operating needs of the Bell telephone companies.

The employees of the division—buyers, transportation specialists, purchased product engineers and inspectors, merchandise personnel and field inspectors—work to ensure that the Bell System's purchased products are of the required quality, at a fair price, and delivered on time. They purchase hundreds of thousands of different items each year and have realized economies of more than \$250 million per year through skillful buying.

WE uses more than 47,000 suppliers and transportation carriers in every state in the Union. More than 90 percent of these suppliers are small businesses with fewer than 500 employees. The division also has established programs to identify and encourage minority-owned firms and firms that employ handicapped people. Purchases from these companies have been growing steadily and have amounted in recent years to over \$67 million per year.

Transportation services to haul raw materials, parts, and finished products to and from more than 100 company locations and to Bell customers around the country are obtained by this division from 4,000 transportation firms. The division headquarters is located at our Guilford Center in Greensboro, North Carolina. Other major organizations in the division are Purchased Products Engineering and Purchased Products Inspection located in Springfield, New Jersey, which, as their names indicate, are responsible for the engineering and inspection of purchased products to ensure the quality of items ordered for WE and the telephone companies.



Top Left: Checking to ensure quality, representatives from Purchased Products Inspection watch as pulp for cardboard packing is processed in a 30,000-gallon vat at a paper supplier.

Top Right: WE inspectors check inside a microwave antenna at a supplier's plant in Chula Vista, California. WE makes and buys microwave equipment for the Bell System for use in relaying long distance communications from coast to coast and border to border.

Bottom Left: A WE buyer and the vice president of one of the company's many minority suppliers discuss various fabricated metal products that the supplier makes for WE.

Bottom Right: Two WE buyers discuss wood pulp with a paper supplier. WE buys nearly 300,000 tons of paper annually for use in telephone directories and Yellow Pages issued by Bell telephone companies.

Government and Commercial Sales

COMMUNICATIONS FOR DEFENSE

The Government and Commercial Sales Division has responsibility for the sale of products and services to the United States Government and other non-Bell System customers. The Division is also responsible for negotiating technology exchange agreements for the Bell System.

Western Electric has a tradition of responding to the Government's needs for both special design projects and telephone communications systems. It particularly seeks to apply new communications related technology in Government projects to the mutual benefit of the Government and the Bell System.

In both war and peace, Western has played an important defense role. During World War II, Western provided communications and radar equipment to the armed forces. Following the war, Western pioneered in early warning defense systems such as the Distant Early Warning "DEW" line network extending from Iceland to the Aleutians. In conjunction with Bell Labs, Western also developed the NIKE AJAX and NIKE HERCULES ground-to-air missile defense systems. More recently Western acted as prime contractor for the SAFEGUARD system for defense against intercontinental ballistic missiles.

Western has contributed significantly to the space programs. These efforts include providing the surface tracking and communications system for Project Mercury, the first manned space flight, and heading the industrial team that designed and built tracking and communications systems for the Gemini and Apollo programs.

The company provides complete telecommunications facilities in the United States and in many foreign countries for various U.S. Government agencies. The facilities provided utilize standard Bell System equipment modified to meet specific Government needs. Currently Western is installing electronic communications



At Edwards Air Force Base in the Mojave Desert we turned over an electronic switching system for use as a customer-owned and maintained base communications system.

equipment at several military bases and in a number of U.S. embassies.

Presently, Western Electric is working on the design and fabrication of modifications to the NIKE HERCULES Air Defense System for NATO. Western's Command Guidance System is now being used to support U.S. Air Force space programs. The system, together with Western Electric-manufactured Missile Borne Guidance Equipment, has proven highly successful in supporting satellite launches.

With Bell Labs, Western Electric is engaged in several vital Navy submarine sonar and underwater surveillance projects. These projects involve the application of acoustic technology and oceanography to the design of products. These designs include extremely reliable underwater sensor components, cable systems and associated data-processing equipment, displays, and secure data transmission and communications links.

Western Electric also sells telephone equipment in the United States and Canada to customers other than the Bell System and U.S. Government. Sales are made to independent telephone companies when the required products are unavailable elsewhere and there is an overall Bell System network interest. Western Electric does not solicit this business since its facilities are dedicated primarily to the production of telecommunications products for the Bell System.

Through its patent licensing efforts, Western Electric negotiates technology exchange agreements on a worldwide basis. The primary purpose of this activity is to obtain the necessary rights for the Bell System to the patented inventions of others. These rights, together with our own inventions, enable the Bell System to continue to utilize the latest technology in providing the United States with high quality communications services at low cost.

Staff Divisions

Western Electric's staff divisions perform specialized functions not directly related to manufacturing or service. These divisions are Finance, Human Resources and Labor Relations, Public Relations, Legal and Patent, Regulatory Matters, and a Patent Licensing organization which licenses other companies to use Bell System patents.

FINANCE

There are three organizations needed for the efficient management of the finances and business systems of the company. The *Comptroller's Organization* establishes the accounting and business methods policy of the company and prepares financial data on earnings and costs. The *Computer Systems Group*, within the *Comptroller's Organization*, is responsible for planning and directing the use of computers, including the development and operation of management and business systems that use computer and communications technology to ensure a constant, accurate flow of data and other information within the company. The *Treasury Organization* is responsible for cash management, domestic and foreign bank operations, and international financial operations. It also manages the company's Pension Plan Fund, one of the largest in the country. Security investment decisions are made by selected banks, investment counselors, and Western Electric. The *Chief Auditor's Organization* provides management with useful information related to the performance of accounting, financial, and computer systems functions to better equip our managers in carrying out their duties as managers of the business. Additionally, the auditing group offers suggestions to management in order to maintain the highest level of financial credibility and to safeguard the assets of the company.

HUMAN RESOURCES AND LABOR RELATIONS

Western Electric has more than 170,000 employees with diverse educational backgrounds and skills working in more than 100 locations across the country. Coordinating the personnel aspects of this varied group is the job of the Human Resources and Labor Relations Division. The division has five organizations working to ensure that our employees are placed in jobs

that match their skills, that they are trained in new skills and new technology, and are adequately compensated for their work. The *Human Resources Administration Organization* handles placement, salary administration, employee benefits, college recruiting, personnel practices, technical professional employee relations, and our equal opportunity and affirmative action programs. Our *Human Resources Development Organization* conducts research to find better ways to manage our human resources. The *Corporate Education Organization* maintains our own small "college," the Corporate Education Center near Princeton, New Jersey, as well as the Corporate Education Chicago Center, where our professional and management employees study technical and business subjects to keep them abreast of the latest developments. The *Labor Relations Organization* negotiates and administers all contracts and agreements with the labor unions that represent WE employees. The *Medical Organization* promotes employee health by developing and administering programs and policies relating to medical examination, treatment and rehabilitation, health education, and epidemiological studies.

PUBLIC RELATIONS

The **Public Relations Division** provides information about the company through advertising, press releases, booklets, and the annual report of the company's activities and financial results. The division also runs community and educational relations programs as a service to the communities in which we work, and administers the company's philanthropic contributions. An important part of the work of this division is employee communications through a variety of print and audiovisual materials. The **Public Relations Division** also assists in preparing product-promotion materials. The *Secretary's Organization* reports to the Public Relations Vice President and is responsible for maintaining the records of the company and the actions of the board of directors and providing administrative services for the corporation.

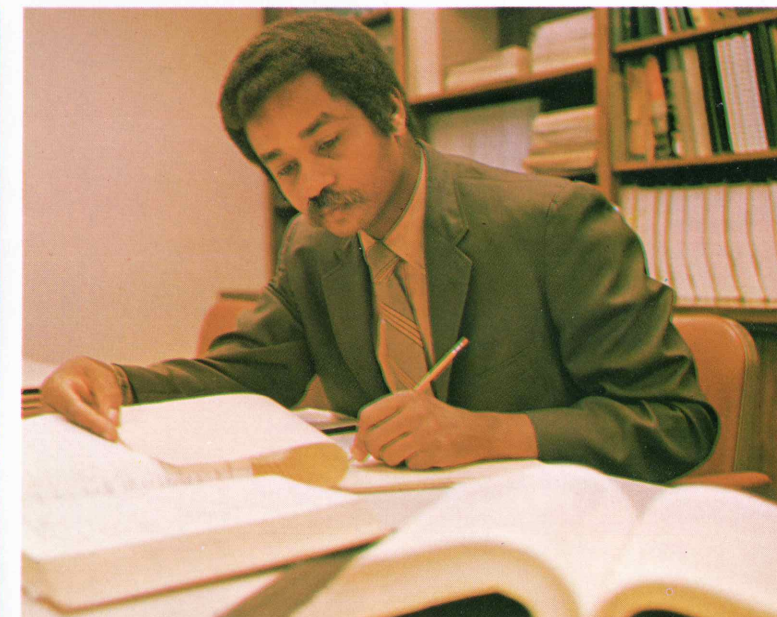
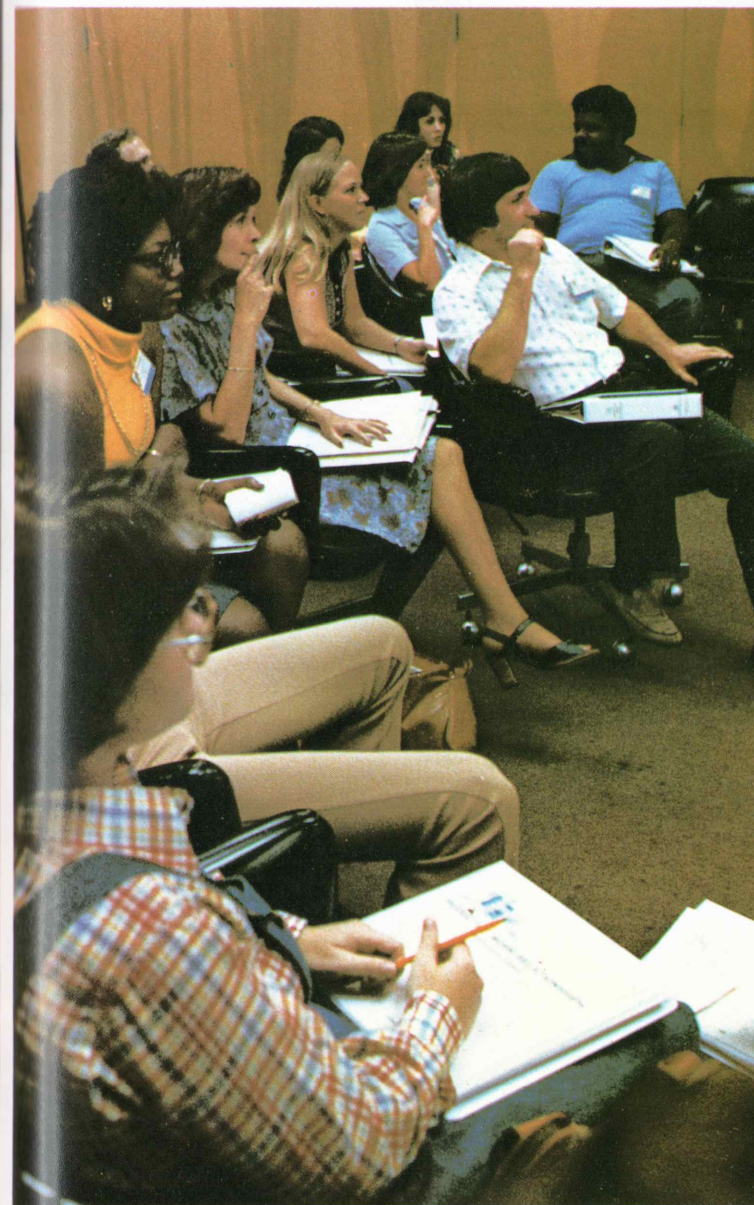
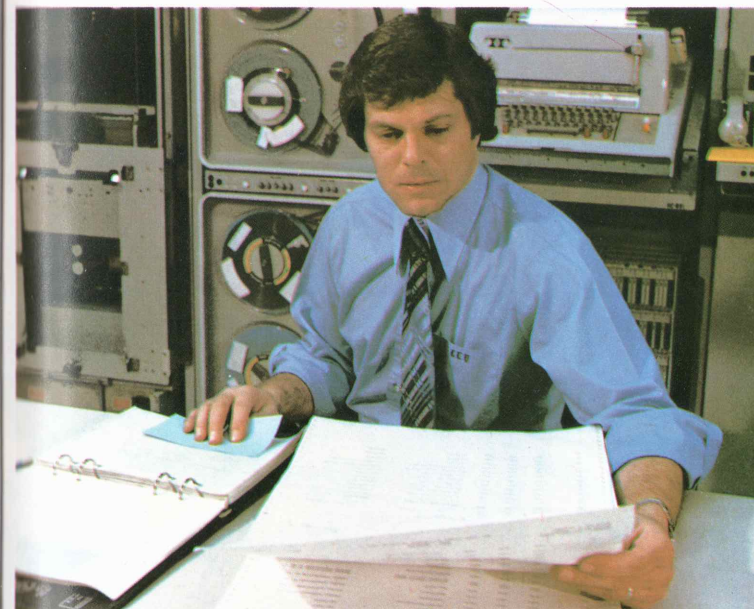
LEGAL AND PATENT DIVISION

The **Legal and Patent Division** provides legal advice and assistance in all matters

with legal and patent implications affecting the company and its operations. The division has six organizations. The *General Patent Attorney* has responsibilities for legal matters relating to patents, trademarks, copyrights, and technical information. The *Associate General Counsel* has responsibilities for counseling and antitrust matters, the conduct of patent litigation, and antitrust litigation. The *Labor Counsel* deals with the legal aspects of relations between the company and its employees including all problems arising under numerous federal and state labor-related laws. The *Tax Counsel's* area of responsibility embraces legal matters relating to all taxes affecting the company. The *General Solicitor* has responsibilities for legal matters involving sales to Bell companies (Standard Supply Contract), corporate governance, the Securities and Exchange Commission, financial matters, real estate, public relations, public affairs, the conduct of product liability, and general litigation. The *General Attorney* has responsibilities for legal matters involving Purchasing and Transportation, Government, Commercial (non-Bell) and International Sales, Patent Licensing, and the conduct of some commercial litigation.

REGULATORY MATTERS DIVISION

While Western Electric is not directly regulated by any federal, state, or municipal public utility regulatory agencies, our corporate affiliation with the Bell operating telephone companies causes involvement with the various regulatory agencies. The **Regulatory Matters Division** is responsible for the regulatory aspects of all matters affecting the company and its operations. This includes responding to inquiries and participating in actions or proceedings, not only of regulatory agencies, but also of the National Association of Regulatory and Utility Commissioners, legislatures, legislative committees or any other body which bears upon the operations of the regulatory agencies, respecting Bell System companies or their transactions with Western. Within the scope of this responsibility, the division coordinates the company's response to discovery proceedings, prepares testimony, provides position papers, and witnesses and manages all aspects of the company's involvement with regulatory agencies.



Top Left: Programmers and systems analysts provide the technical expertise to ensure that WE gets maximum efficiency from its computer systems.

Top Right: In New York, a financial associate in the Treasurer's Organization discusses business forecasts with her supervisor.

Above: A patent attorney in our Washington office does some of the extensive research and documentation required to obtain a patent on a new product or manufacturing process.

Left: At our Corporate Education Center, new employees attend an orientation program. The CEC offers both management and technical courses for our employees.

Western Electric has four principal subsidiaries, plus Bell Laboratories (which it owns jointly with AT&T). The four are: Western Electric International, Incorporated, Teletype Corporation, Nassau Recycle Corporation, and the Sandia Corporation.

Teletype Corporation, which became a subsidiary of Western Electric in 1930, develops and manufactures data terminals for the Bell System, other companies, and the U.S. Government, for use in data communications and computer systems. It has plants in Skokie, Illinois, and Little Rock, Arkansas, and a nationwide network of service centers.

Nassau Recycle Corporation, acquired in 1931, reclaims and recycles nonferrous metals such as copper and zinc from scrap equipment and cable sent to it by Western Electric and Bell telephone companies. Nassau Recycle provides Western with about one third of the copper it uses in manufacturing. It has plants in Gaston, South Carolina and Staten Island, New York.

Sandia Corporation is operated by Western Electric for the Department of Energy under a no-profit, no-fee contract. WE has managed Sandia since 1949. Sandia's principal functions are the research and development of nuclear ordnance and research on energy projects and various other programs of national interest. Sandia has laboratories in Albuquerque, New Mexico and Livermore, California.

About Our Subsidiaries



Top: Teletype® 4540 communications terminals, first in a new 4500 series, are especially attractive for computer input-output applications.

Bottom: On the assembly line at Teletype Corporation's plant in Skokie, an employee conducts final tests of Model 43 units.



Top: At Sandia, scientists conduct basic energy research on systems such as this power-generating wind turbine.

Bottom: Workers strip lead from used cable at Nassau Recycle's plant in Staten Island, New York.



Top: This field of solar collectors, developed by Sandia and New Mexico State University, powers a system capable of irrigating 100 acres of farmland in Estancia Valley, New Mexico.

Bottom: Operators at Nassau Recycle cast molten copper into rods. The energy Western Electric saves annually by using recycled copper, instead of raw ore, would heat 75,000 homes for a year.

Western Electric International markets telecommunications equipment and services outside the United States and Canada.

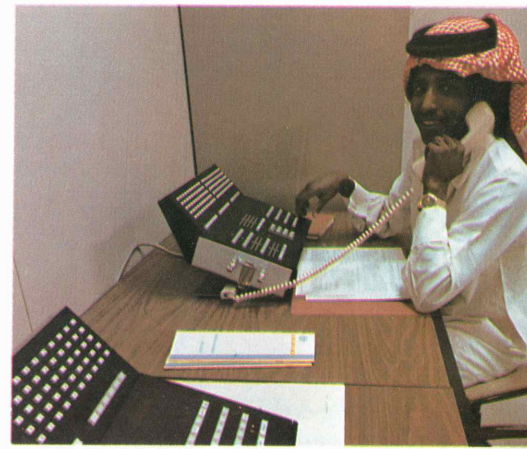
From its headquarters in Greensboro, North Carolina, WE International sells a complete Bell System line of modern telecommunications systems and services. Project management teams supervise and coordinate each project, drawing on the expertise of the entire Bell System to provide the finest telecommunications systems and complete support services. These support services include: network or system design and engineering, installation and testing, logistic support, and operations and maintenance of completed systems. WE International makes use of various Bell System locations and facilities to train customer personnel to assume operation and maintenance of the systems.

One of WE International's major projects, completed in December, 1979, was a 299-station, 6,200-mile microwave telecommunications system, one of the largest complete networks ever installed, for the Kingdom of Saudi Arabia.

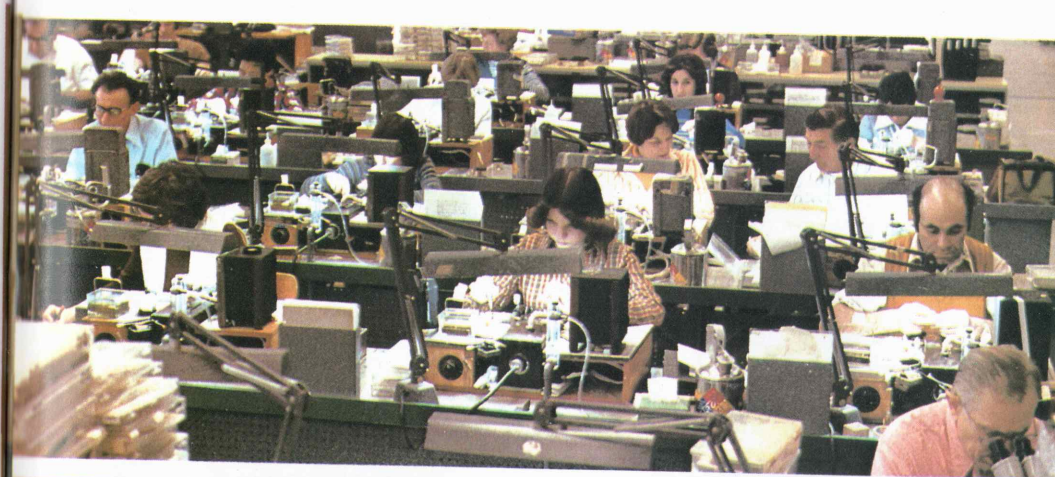
Included on the list of major overseas projects are two contracts with Taiwan. One is to provide Taiwan with an electronic switching system, while the other is to provide an undersea telecommunications cable from Taiwan to Guam. In addition, WE International was selected for a five-year project to provide the Republic of Korea with both local and long-distance electronic switching systems. As part of this commitment, WE International will also provide Korean companies with Bell System training and technology to manufacture local electronic switching systems. The Korean projects are among the largest ever undertaken by any telecommunications company.

WE International has sales and marketing offices in Saudi Arabia, South Korea, Taiwan, Central and South America as well as distributors and/or agents in several countries.

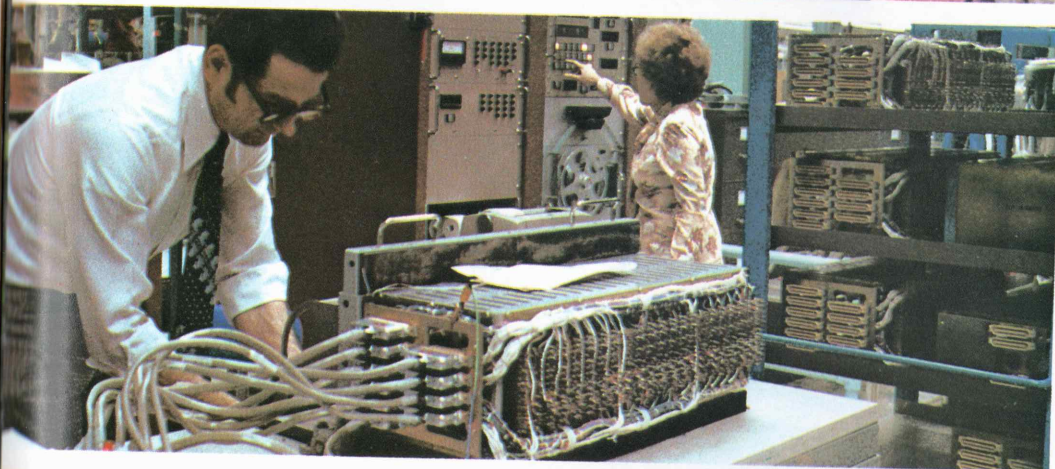
Western Electric International



Above: An operator at the University of Riyadh in Saudi Arabia uses the console of our Dimension 2000 private branch exchange system.

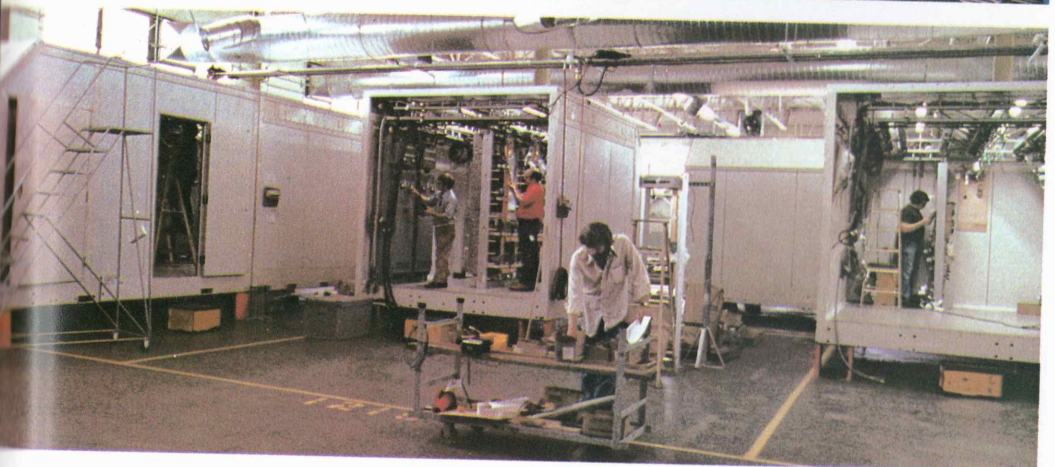


Top Right: At our Merrimack Valley Works, employees assemble crystals which will be used in transmission equipment for international sales.

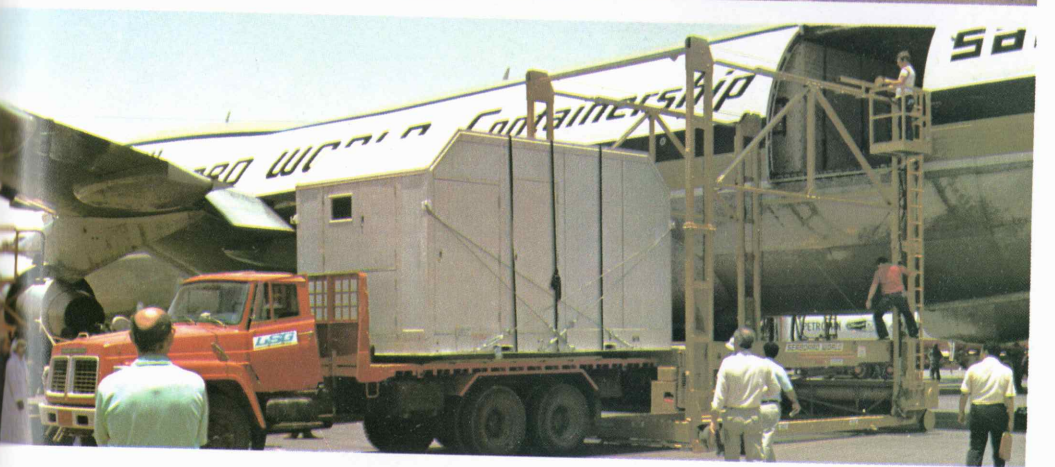


Second Right: Testers using electronic equipment ensure the high quality of our products before they leave the factory.

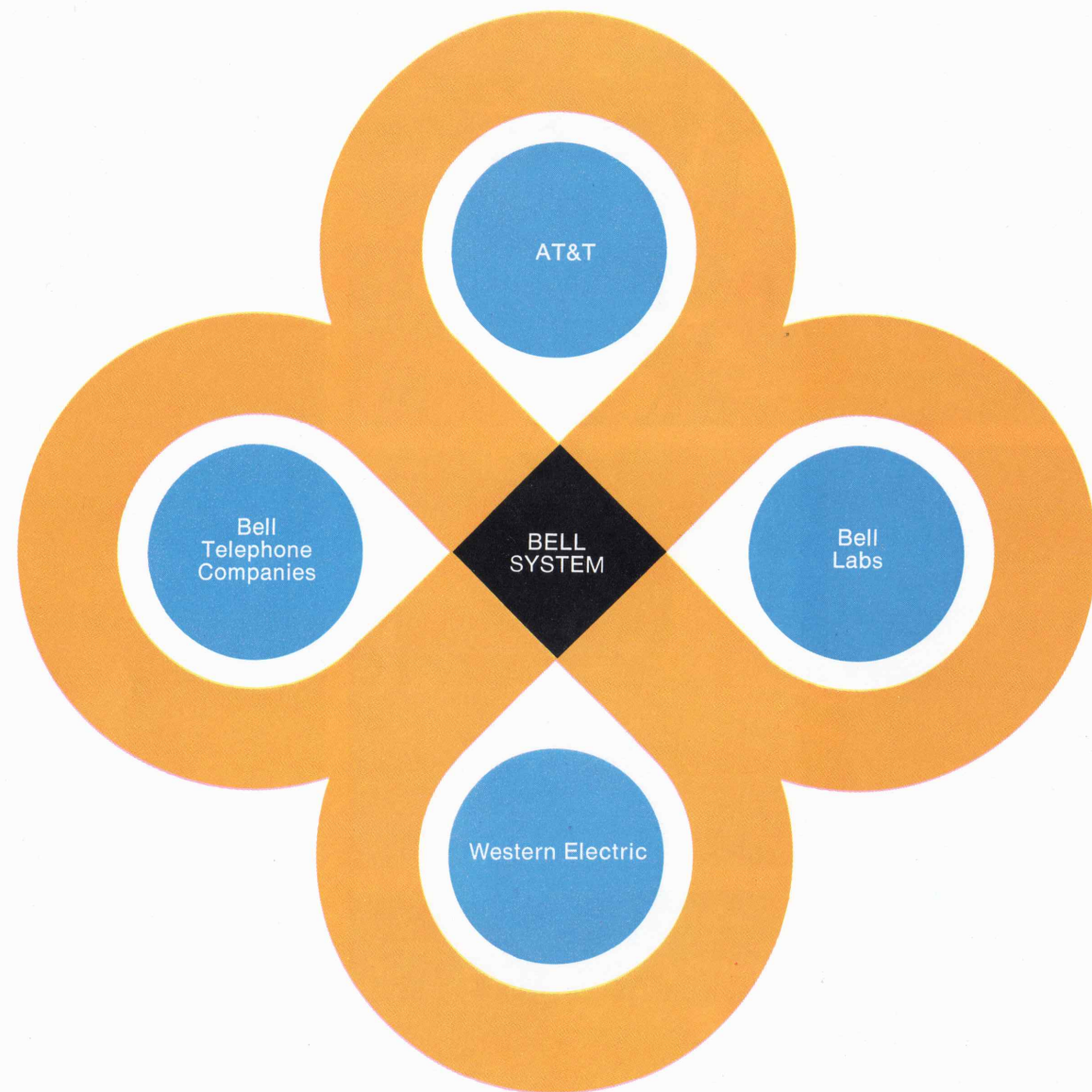
Third Right: In Atlanta, experienced installers equip prefabricated modules with transmission equipment for shipment overseas. Modular designs allow for efficient installation and testing in the U.S.



Bottom Right: At the airport in Riyadh, Saudi Arabia, an equipment shelter is unloaded only hours after leaving the U.S.



Above: One of the towers of the 299-station microwave system WE International built for the Kingdom of Saudi Arabia is ready for mounting the radio antennae that will overcome the distances of the desert.



How We Fit In The Bell System

AT&T is the parent company of the world's largest communications system and is a majority stockholder in 21 of the 23 associated Bell telephone operating companies. It provides direction and overall coordination and planning. AT&T's Long Lines Department controls and directs long distance telephone service through a nationwide network of facilities.

The 23 associated operating companies provide communications services to subscribers.

Bell Laboratories is owned 50 percent by AT&T and 50 percent by Western Electric. It performs research, design, and development functions for the Bell System. It also develops business information systems to help the telephone companies handle increasing business information needs.

Western Electric, a wholly owned subsidiary of AT&T, takes ideas from Bell Labs and turns them into production-line reality. We supply the material, the products, the skilled installation, and the maintenance needed to keep the system running smoothly.

Western Electric's fundamental purpose is to help the Bell telephone companies provide the finest communications service in the world at reasonable cost.