Northern Electric

who we are – what we do

contents

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Front Cover

Technician inspecting a photographic pattern, used in the diffusion of semiconductor devices, before reduction to final mask size.

who we are – what we do

Northern Electric Company Limited is Canada's largest manufacturer of telecommunications equipment and wires and cables. It employs some 18,000 people in six major manufacturing plants, research and development laboratories and 31 sales locations across Canada. Competent representatives travel six continents.

Northern Electric is a wholly-owned subsidiary of The Bell Telephone Company of Canada. Starting in 1882 as the manufacturing department of Bell of Canada, Northern passed through a number of intermediate stages before reaching its present corporate form in 1914.

Northern is a Canadian-owned company because 97% of the 195,000 shareholders of Bell of Canada live in Canada and own 93% of Bell's stock.

Total sales in 1963 were $302,000,000. This compares with $236,000,000 in 1959, an increase of 27 per cent in five years. In the last 18 years, manufacturing space has been quadrupled to meet the increase in product demand.

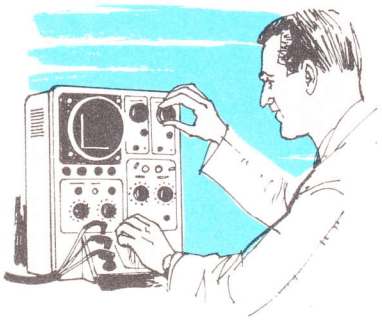
Today, after more than 50 years' leadership, Northern's name is identified with the highest quality in telecommunications equipment.

the creative atmosphere

Continuous expansion has marked Northern's Research and Development Laboratories ever since they were founded on a 75-acre site just west of Ottawa. Initially composed of one administration and one laboratory building, the laboratories will eventually include four buildings, the third of which is scheduled for completion in 1965 and will more than double the existing laboratory space.

In the creative atmosphere of the laboratories, top ranking scientists, engineers and technicians design and develop new products to meet specific Canadian or overseas conditions not adequately catered to by present designs. Research is carried out in electronic circuitry, microminiaturization, solid state physics, ferrites and other equally advanced fields.

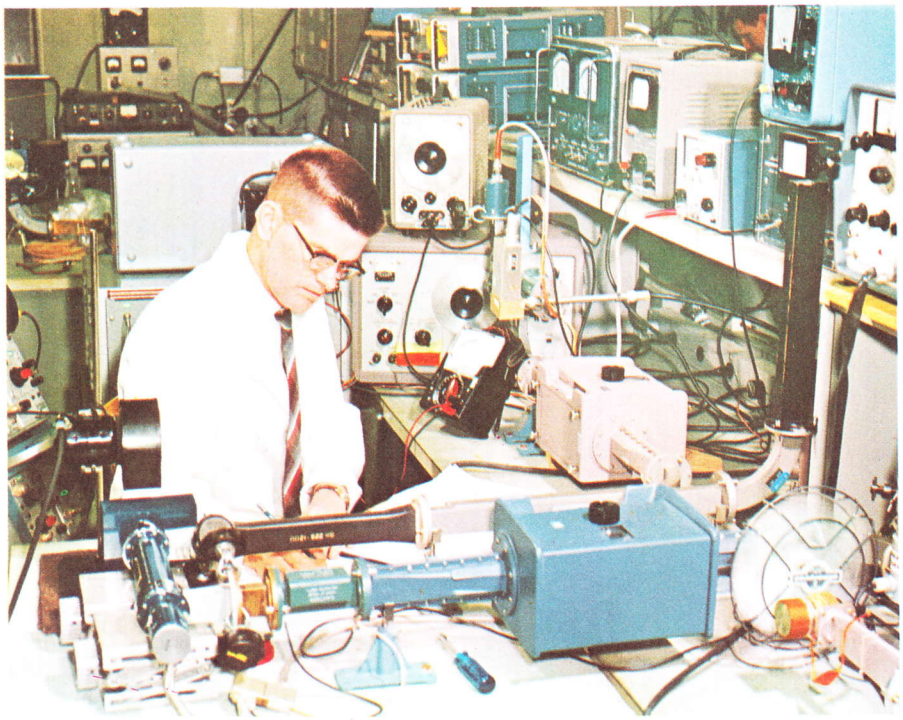
There is a continuous two-way flow of information maintained between the laboratories and the manufacturing divisions in order to ensure that new products and systems will be manufactured to the highest quality standards and at a cost acceptable to customers.



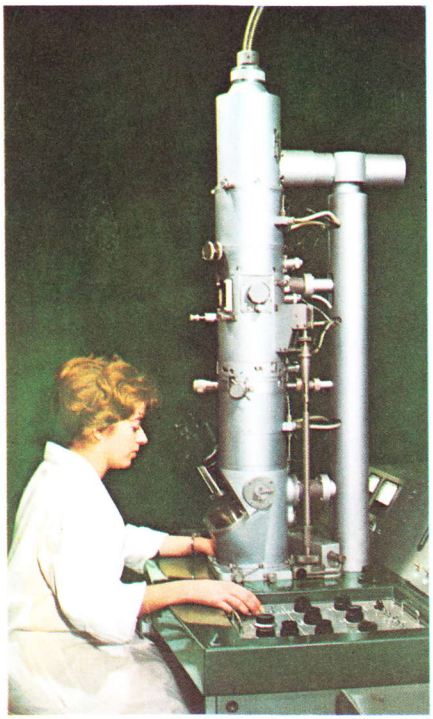
RESEARCH AND DEVELOPMENT LABORATORIES

Floor space 100,000 square feet
Total employees 625
Engineers and technicians 365

Test equipment used for research is the most advanced available.



Through this electron microscope, the structure of elements can be studied at 25,000 times their actual size.



Model of a precision satellite tracking antenna designed for the Defense Research Telecommunications Board of the Federal Government.

craftsmanship and quality

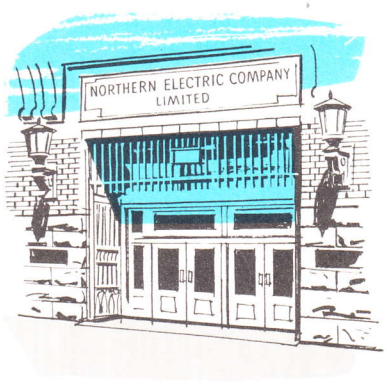
The establishment of Montreal Works in 1915 was an important event in the history of Northern Electric. In its early days a tradition of craftsmanship and high quality was established. The telecommunications equipment manufactured in Montreal Works proved its continuing worth and reliability, and played an important role in the development and growth of Canada.

Montreal Works has been the birthplace of ideas and plans leading to the building of new Northern Electric factories in other communities. It has provided and still continues to provide a nucleus of skilled craftsmen, technicians, engineers and management people necessary to the successful operation of new plants.

Montreal Works is also the birthplace of products and systems which were originated only recently; these include time division multiplexing, pulse code modulation, electronic switching, high speed data transmission and solid state microwave techniques.

These new systems incorporate modern "hardware" or components such as semiconductors, ferrites, printed circuitry and miniature components, many of which are manufactured here.

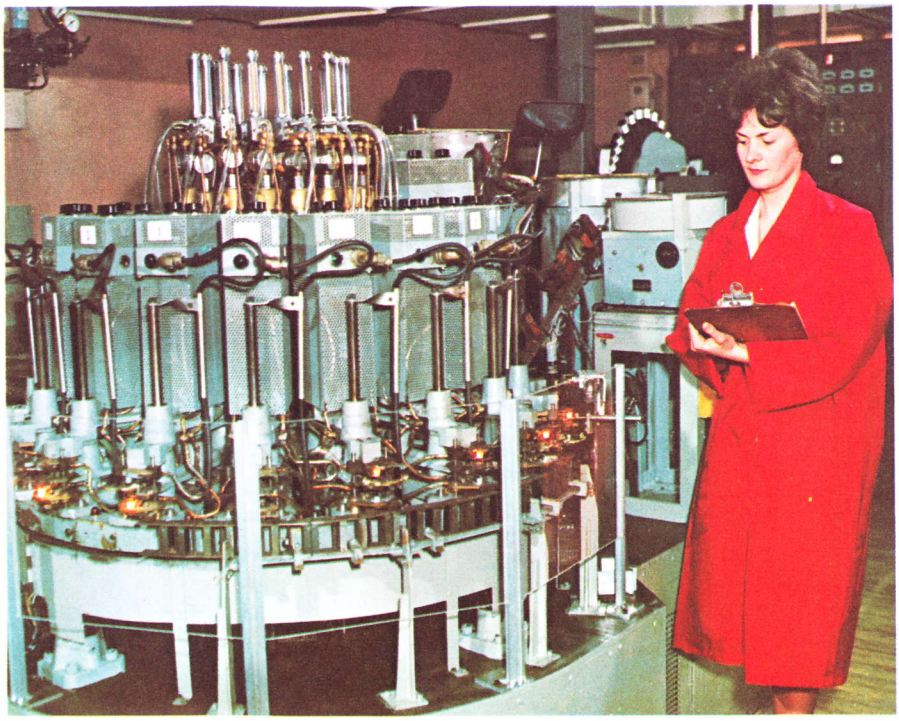
The tradition of high quality and technical competence at Montreal Works, established so long ago, is still very much alive as this plant continues to play a vital part in producing Canada's telecommunications requirements.



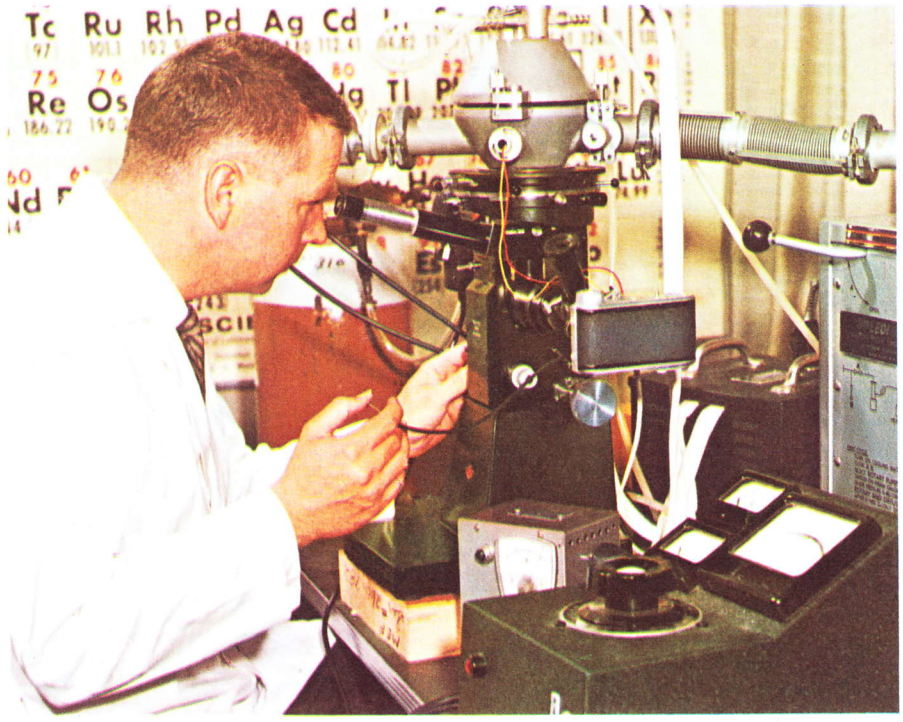
MONTREAL WORKS

Floor space 1,000,000 square feet
Total employees 6,135
Engineers and technicians 733

Technician supervises production of dry reed switches.



Transistor components are examined under a vacutherm microscope.



quality assurance

At Lachine Works, Northern produces wires and cables to serve the telecommunications and power needs of Canada and the export market.

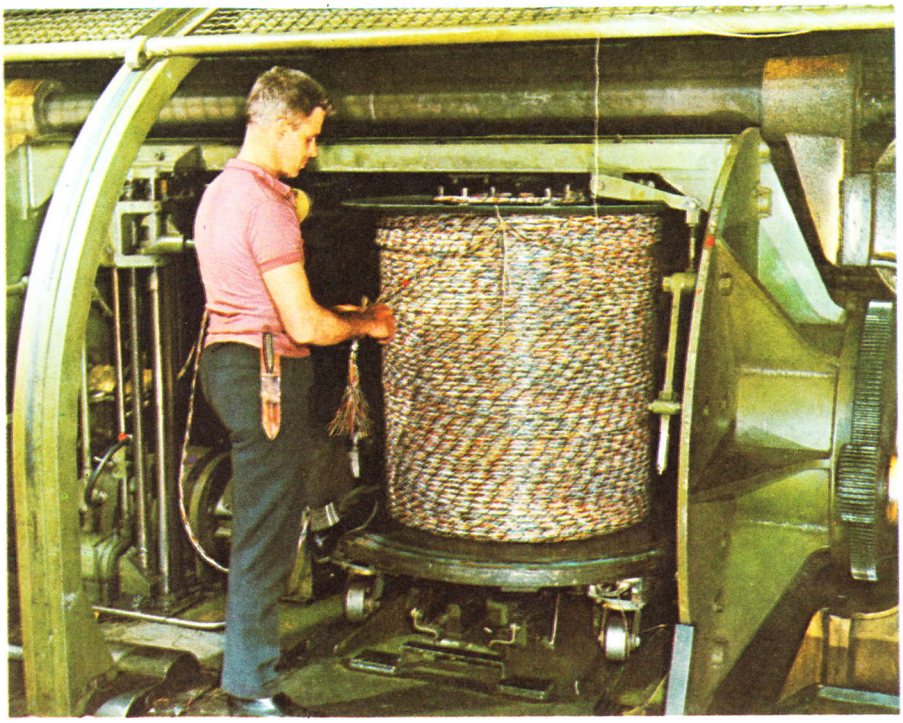
In a year 80 million pounds of raw materials including copper, aluminum, lead, paper, rubber and plastics are processed into 5000 different types of wires and cables.

As "steel men" are developed through years of experience with red hot metal so "cable men" are developed by years of experience with the massive machinery which produces wires and cables. Many of the people in the Cable Division have spent all their working lives in this demanding and challenging work. The combination of skilled men, modern machines and the very latest in testing procedures is assurance that the blue reels with the N.E. trademark carry wires and cables that are the best that can be made.

LACHINE WORKS

Floor space 977,977 square feet
Total employees 1,833
Engineers and technicians 158

The ends of a plastic-insulated cable are bound before removal from the strander.

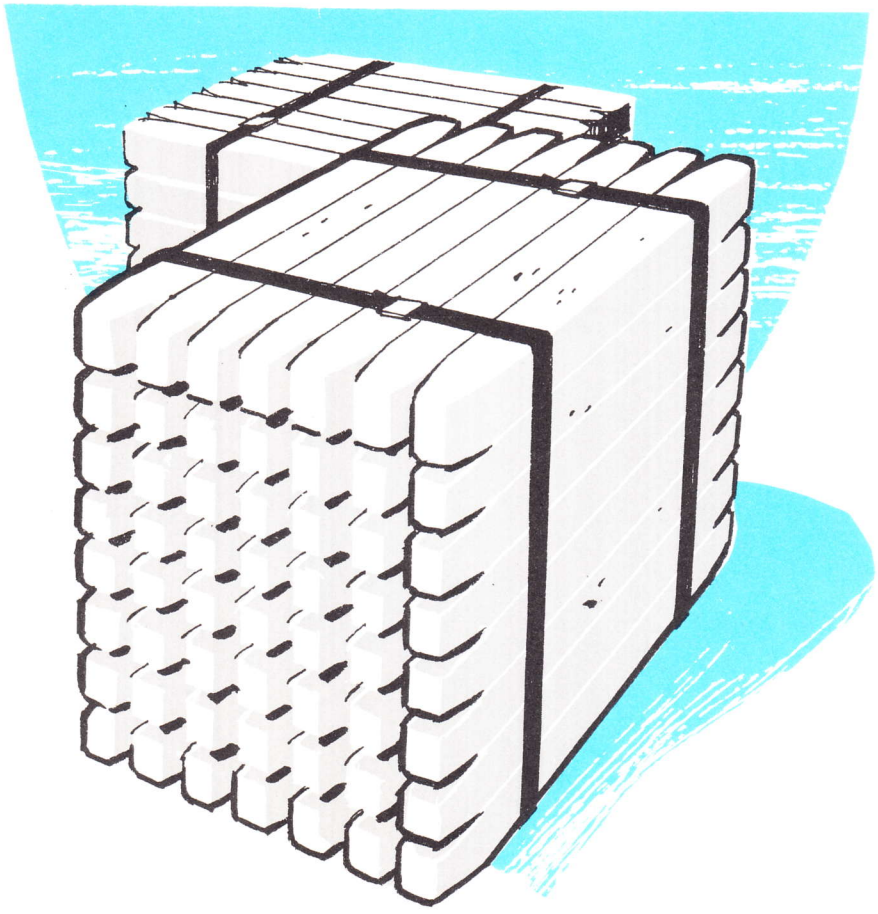


Partial view of the most completely equipped laboratory in the Canadian wire and cable industry.

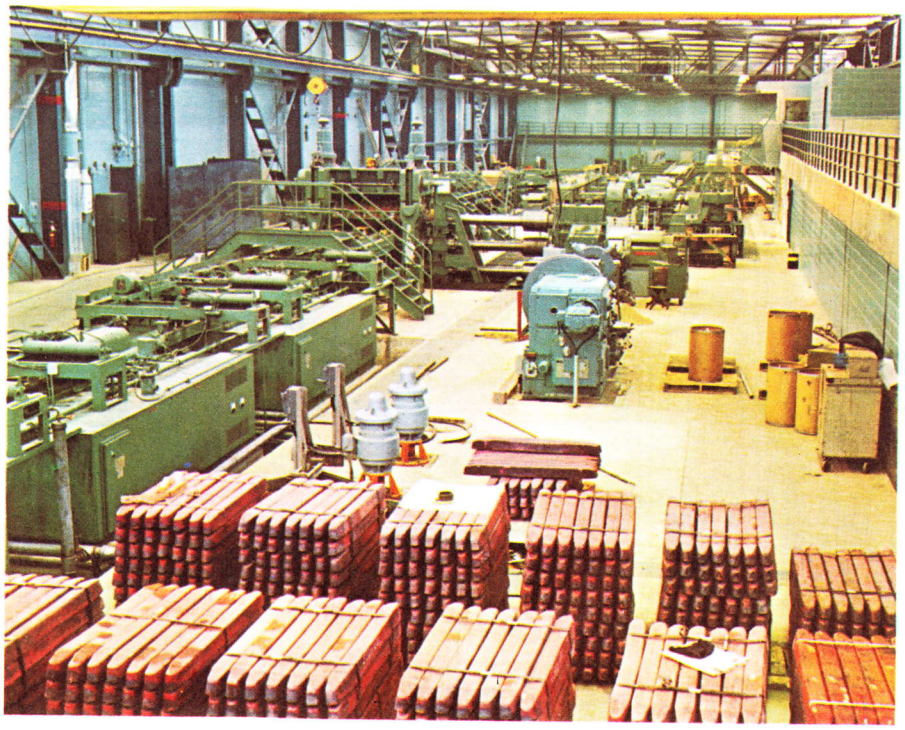
from bar to coil

The new Copper Rod Rolling Mill, adjacent to the Lachine Works, is a good example of the up-to-date production methods used by Northern Electric to keep prices at a competitive level. It is one of the few copper rod rolling mills in the world with induction heating, automatic continuous rolling and automatic spray pickling in one continuous line.

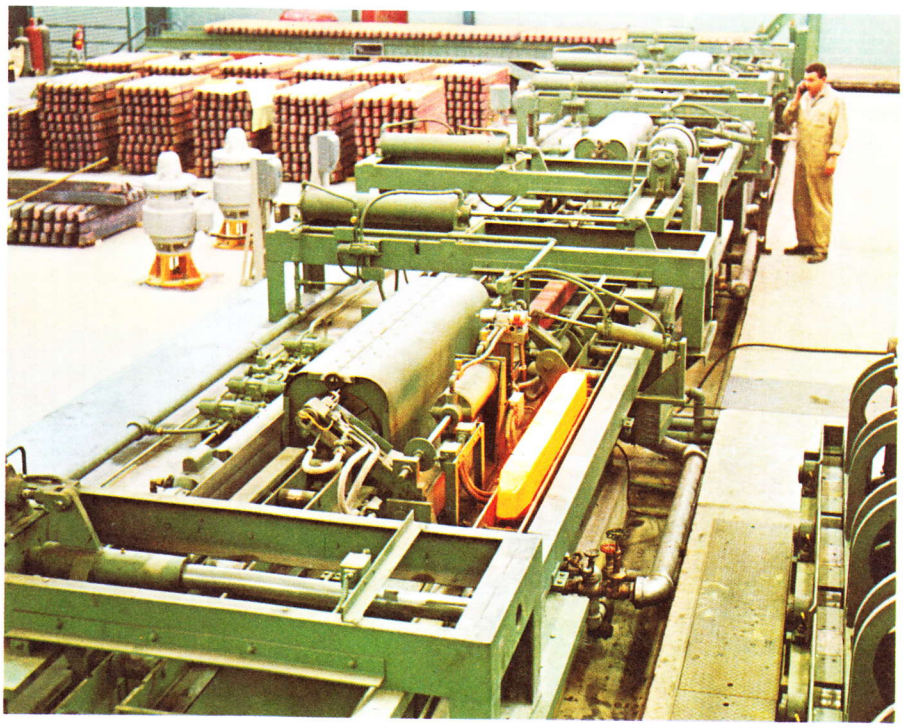
Copper wire bars 54 inches long and weighing 265 pounds are heated in low-frequency induction furnaces and then rolled into 900-foot coils of 5/16 inch copper rod in just over 90 seconds. The entire mill is controlled from a central position and the only operations performed by hand are the loading of the bars on the input conveyor and the pre-welding of the coils at the finish. The mill produces 15 miles of rod per hour, or at a rate of 1,200 miles of rod per week.



All operations in the Rod Mill are controlled by one man located in the control room projecting from the balcony at the upper right.



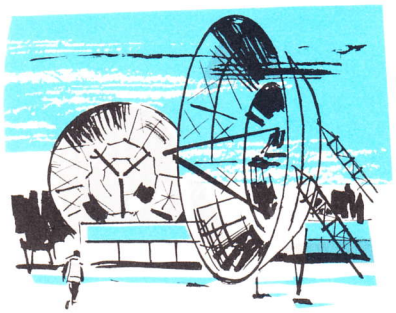
Two minutes in the low-frequency heating furnace brings a copper bar to 1750 degrees Fahrenheit.



complex electronic products

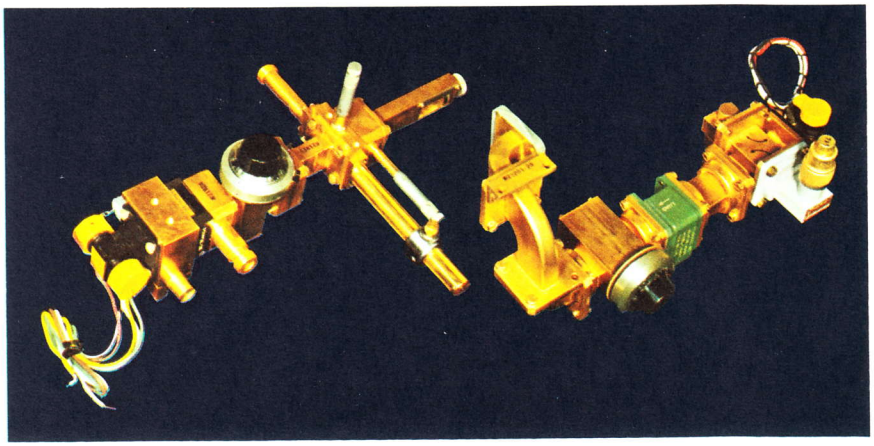
At the Belleville Works, Northern Electric builds TV studio routing equipment, airborne navigational gear both for the Canadian armed forces and for export, tropospheric scatter radio equipment and many other highly complex electronic systems.

The manufacture of these products requires skilled engineers and versatile production workers, as well as a high degree of employee involvement in the work process. The individual worker is frequently responsible for a complete production unit. He takes pride in this responsibility. Inspection procedures are so thorough that one in every five employees is responsible for some phase of testing.

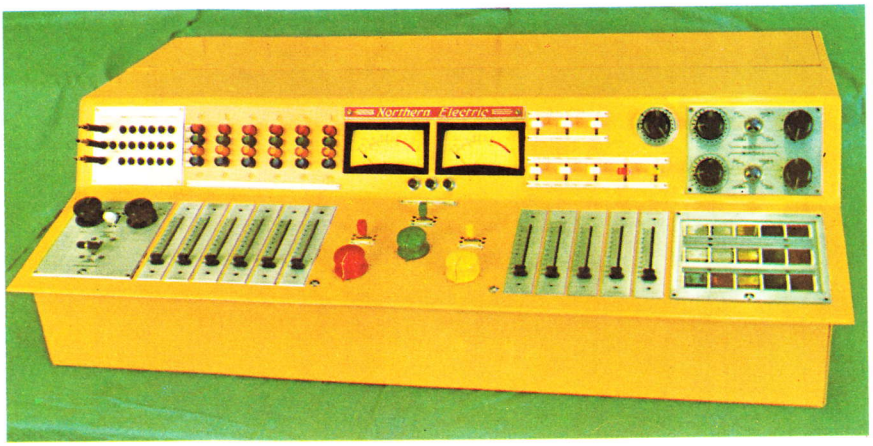


BELLEVILLE WORKS

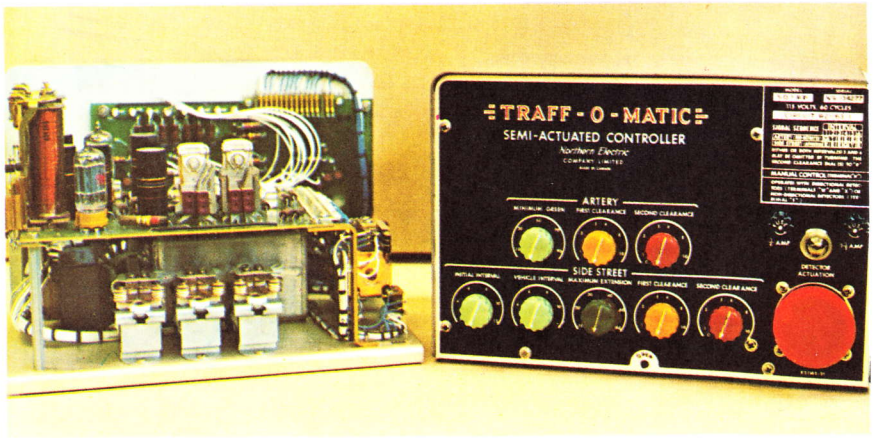
Floor space 225,750 square feet
Total staff 875
Engineers and technicians 124



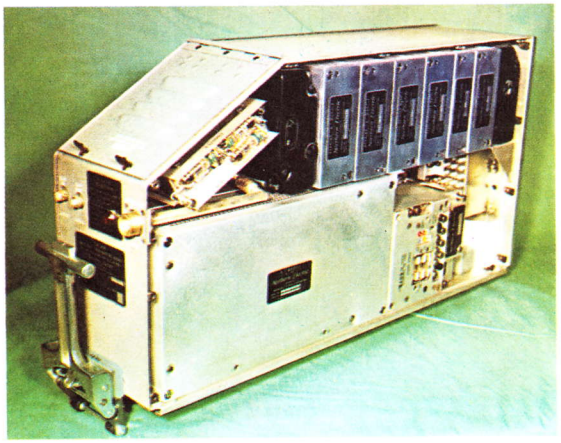
Wave Guide Assemblies used in the Parametric Amplifier.



Speech Input Equipment for Television Studios.



Semi-actuated Traffic Controller.



TACAN Transmitter-Receiver unit used in the CF-104 Reconnaissance Bomber.

telephone instruments

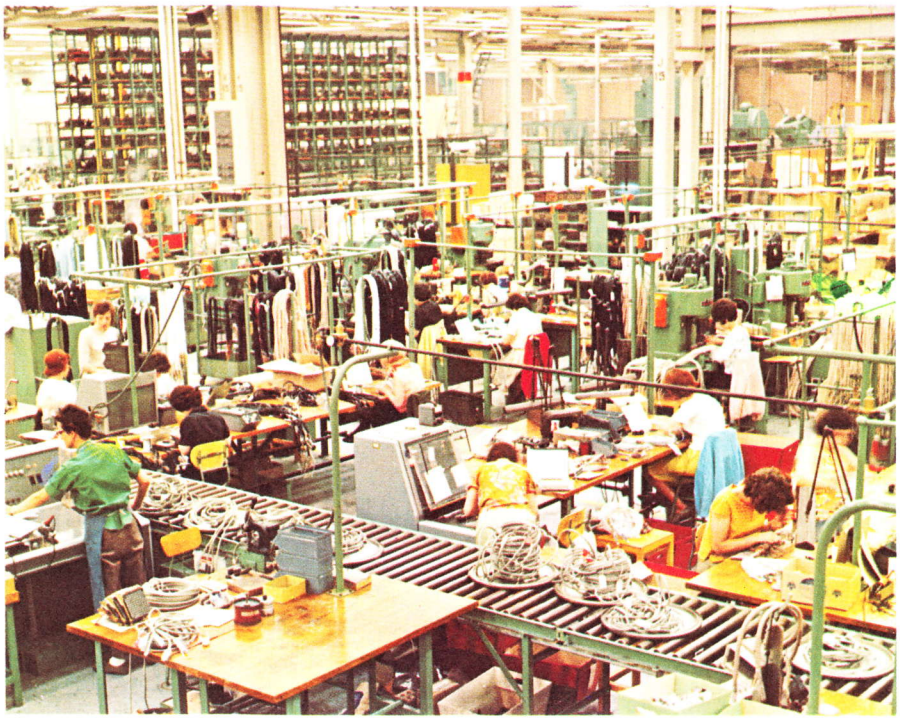
The output of London Works exceeds $30,000,000 a year. Half of this is composed of telephone instruments, of which London produces 700,000 a year of five hundred different types. The balance includes telephone booths, cable terminating and protection equipment.

Some six hundred suppliers provide the raw materials or components from which London's products are made. London Works buys coal in tons and crushes it to make the carbon used in telephone transmitters; gold in ounces to coat the electrical contacts which are a part of every telephone; plastics in many types and colours to mould into components and housings for telephone sets.

LONDON WORKS

Floor space 375,000 square feet
Total employees 1,759
Engineers and technicians 118

More than 2½ million telephone cords are made each year.



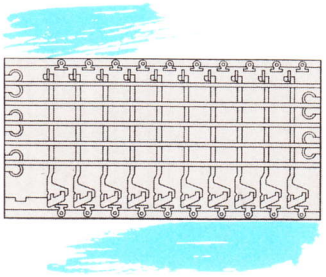
Telephone set dials receive final adjustment.

crossbar switching

In the early days of the telephone industry all switching was done manually by means of plugs and jacks in a telephone exchange. As telephones in hundreds, thousands and tens of thousands were added to the telephone network, "switching" became a very complicated process.

Today Northern Electric's modern method of providing automatic telephone switching makes use of equipment called "crossbar". Crossbar switching makes direct distance dialing possible by storing and analysing the number dialed, using it and re-using it until the connection is made.

In 1963 Toronto Works manufactured crossbar switching equipment for 200,000 new telephone lines. This switching equipment used 3,000 tons of material made up of 14,500 different items, including 250 million feet of insulated wire, one million miles of enamelled copper wire for the manufacture of coils (this is sufficient to extend from earth to moon and return twice) and 24 million screws of various sizes. 130,000 contacts of precious metal were welded and 60 million wired connections were made.

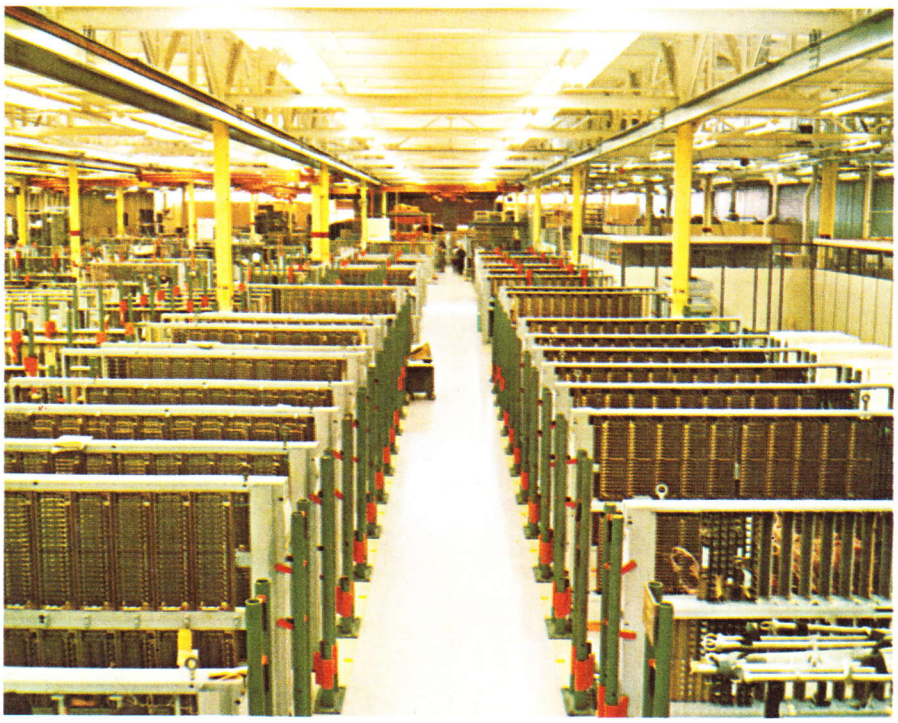


TORONTO WORKS

Floor space 490,000 square feet
Total employees 1,785
Engineers and technicians 191

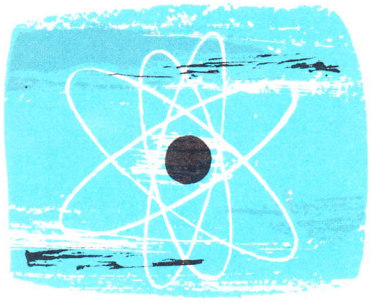
In the middle background operators wind coils which are assembled into dry reed relays by the operators in the foreground.

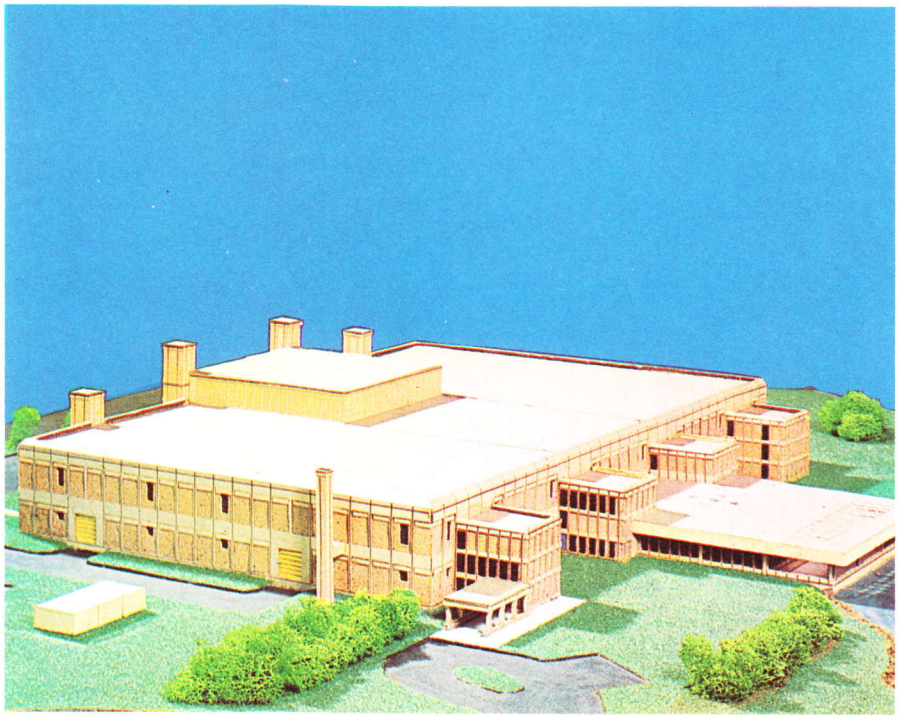
Crossbar components including switches, wired units and multi-contact relays, all made at Toronto Works, are mounted on frameworks.



building for the future

Northern Electric's Advanced Devices Centre is scheduled to open in the summer of 1965. Many kinds of modern devices now produced by the Company in several locations will be manufactured under one roof. Here, such solid state devices as transistors, thin film and other micro-electronic components will be made in an environment rigorously controlled with respect to temperature, humidity and cleanliness. Modern test facilities and quality control methods will ensure that products meet the most exacting parameters. Reliability controls will make predictions of life performance possible. Designed for rapid expansion, the Advanced Devices Centre is located less than a mile from Northern Electric's Research and Development Laboratories, thus facilitating close co-ordination between research and production engineering groups. From initial design concept to final product development on new devices, no time will be lost.



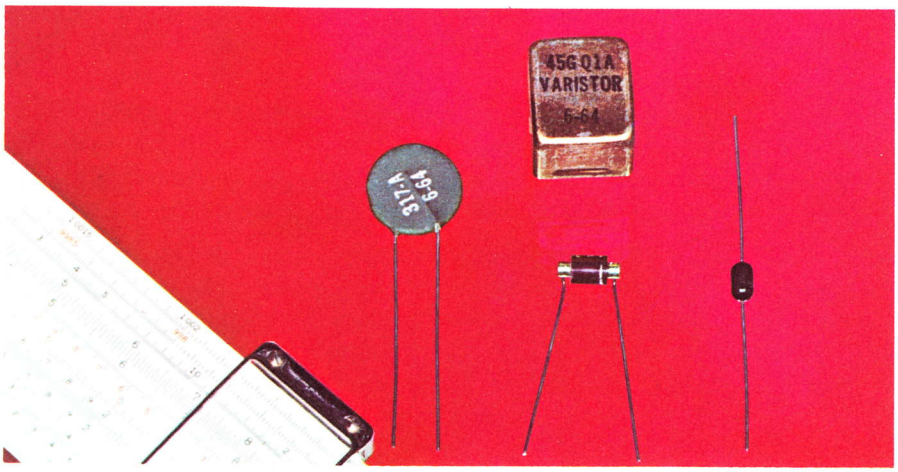


ADVANCED DEVICES CENTRE

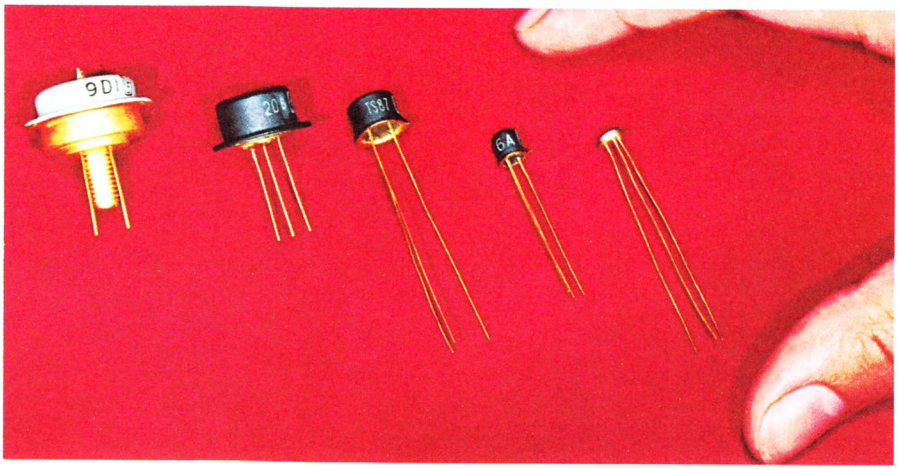
Floor space 175,000 square feet
Planned for a staff of 400

Typical examples of the device families which will be produced at the Advanced Devices Centre.

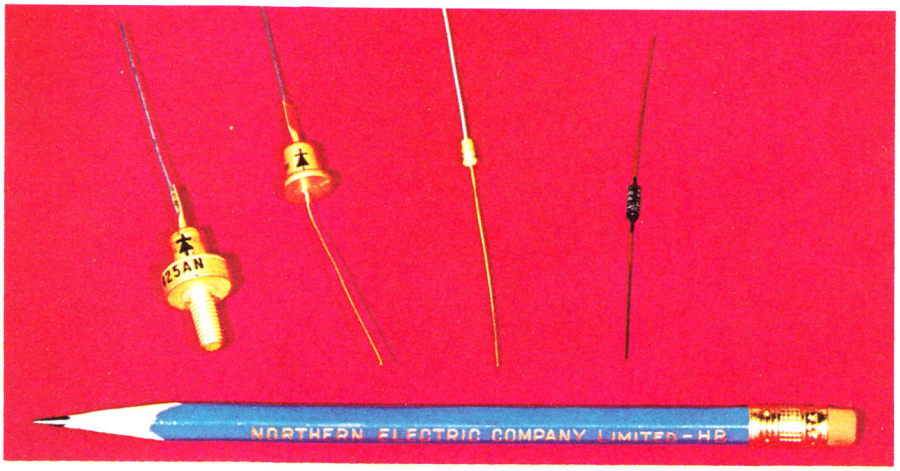
Varistors



Transistors



Diodes



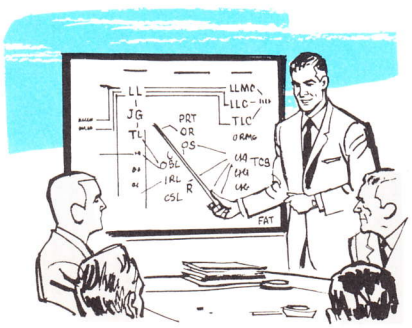
systems engineering

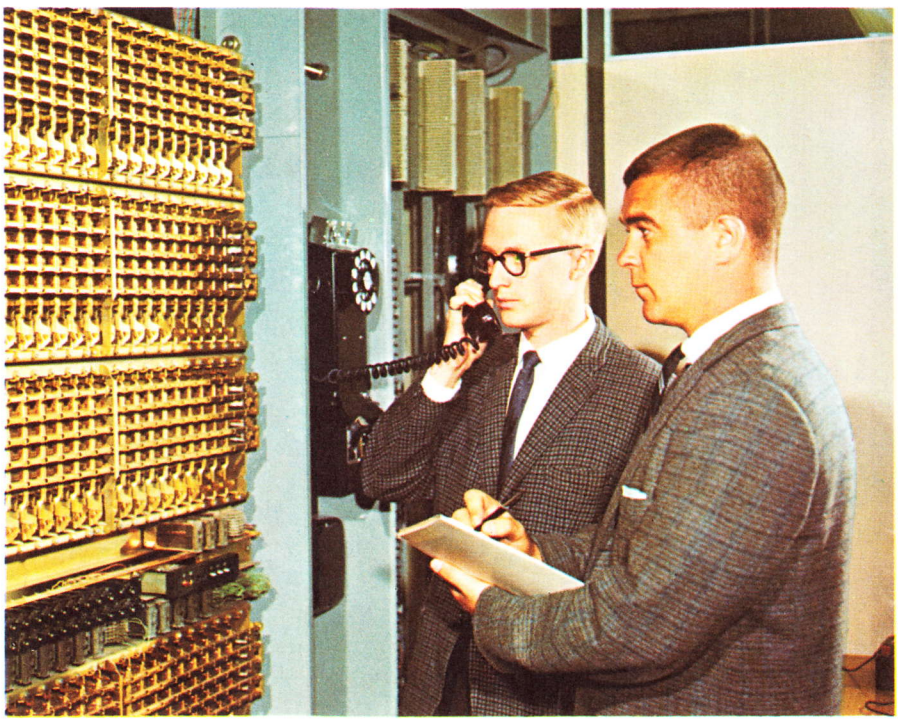
The Systems Engineering Department is responsible for engineering telecommunications systems to meet the specific needs of customers with widely varying requirements. Systems Engineering originates the complex drawings and specifications required by the manufacturing and installation groups as well as customers.

The evolution of a system starts with the Systems Engineer. He is the overall architect and designer.

It is the responsibility of the Systems Engineer to examine the customer's facilities, to determine what existing features there are and what new features have to be added. It is his responsibility to devise a plan for a complete working system which will meet the customer's specifications and which can be produced at a competitive price.

Systems Engineers work closely with customers in interpreting requirements and recommending the most suitable and economical system to meet particular needs. Systems Engineers also collaborate with Research and Development Engineers to anticipate the customer's needs to ensure that the latest technological advances are incorporated in dependable telecommunications systems at minimum cost.





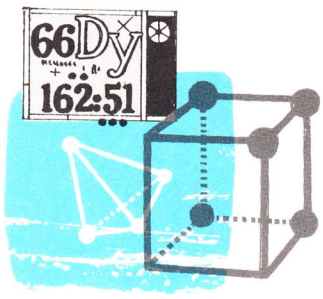
Engineers work on a prototype SA-1 Crossbar office.

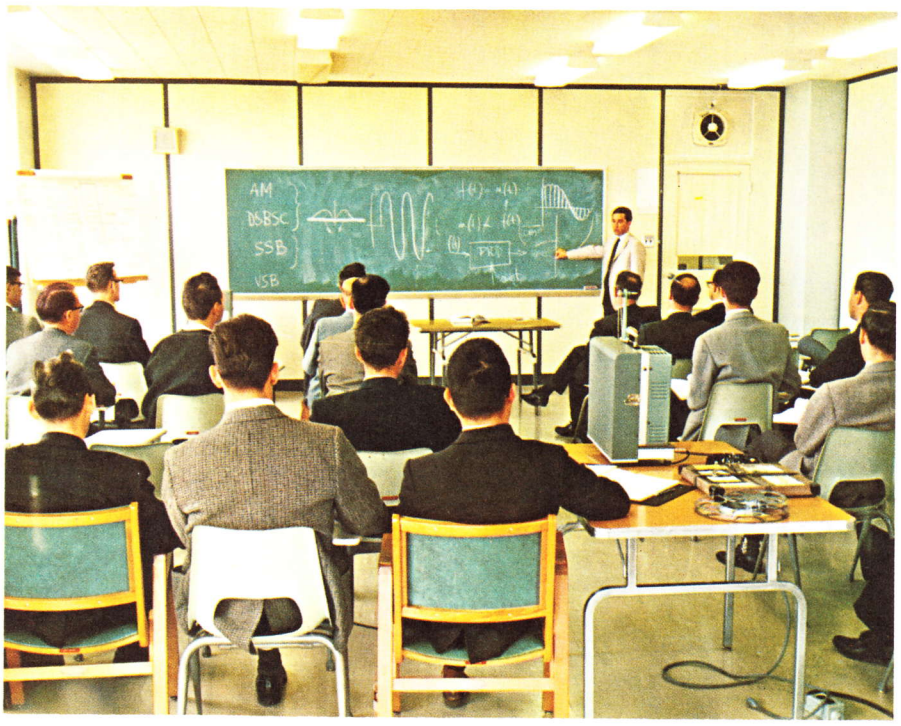
the training centre

The rapid rate of technological advancement in the telecommunications industry makes it imperative for Northern Electric to keep employees abreast of the latest scientific developments.

As telecommunications products increase in complexity new demands are placed on the engineers responsible for design and manufacture. The Training Centre in Montreal helps the engineer master new skills so that he can increase his individual contribution in areas marked by constant change.

A total of forty-six courses is now available at the Training Centre. These range from an introductory course on drafting to courses in mechanical design, second-generation semiconductors and advanced switching theory. Some of the courses given here are also available at other Company locations. The Training Centre has been attended by engineers from many Canadian telecommunications companies, as well as from overseas.





Engineers taking a course on telephone transmission theory.

serving customers in Canada . . .

Northern Electric's customers include power utilities, industrials, government departments, electrical contractors and, of course, telecommunications utilities. There are some 2,500 separate telephone systems in Canada. The Bell Telephone Company of Canada, the largest of these and owner of Northern Electric, serves close to four million of the country's 6½ million telephones. The smallest operates a single telephone. In between, the systems range in size from rural cooperatives serving a handful of customers to large provincially and privately-owned systems.

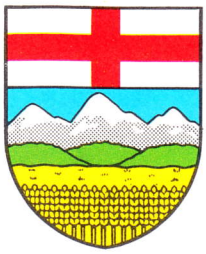
Many of these companies have been customers of Northern Electric for half a century. Northern Electric is in constant touch with its customers offering engineering advice as well as the equipment and supplies required for the construction and maintenance of their systems. The Company is always ready to provide technical service to assist customers in the selection of the most suitable and economical type of electrical and power equipment.

Northern Electric also acts as distributor for several hundred other Canadian manufacturers, thus providing customers with a complete service. Products distributed include: power apparatus; illumination equipment; wiring materials; equipment for the overhead and underground transmission of communications and electrical power and also acoustic materials. There are distribution centres in 31 key locations from the Atlantic to the Pacific.

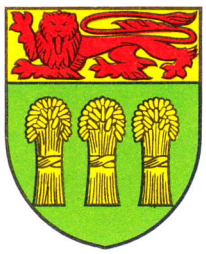
YUKON

NORTHWEST TERRITORIES

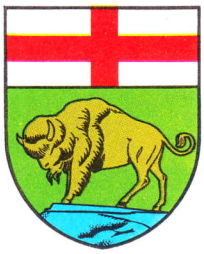
BRITISH COLUMBIA



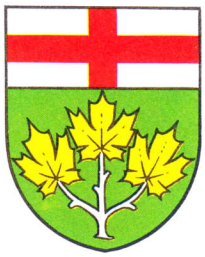
ALBERTA



SASKATCHEWAN



MANITOBA



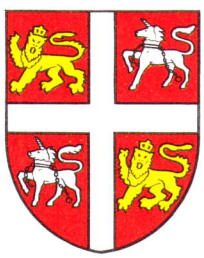
ONTARIO

QUEBEC

NEW BRUNSWICK

PRINCE EDWARD ISLAND

NOVA SCOTIA



NEWFOUNDLAND

. . . and overseas

Northern Electric has employees fluent in these languages.

Afrikaans
Arabic
Bengali
Bulgarian
Cantonese
Chinese
Croatian
Czechoslovakian
Damil
Danish
Dutch
English
Estonian
Finnish
Flemish
French
Gaelic
German
Greek
Gujariti
Hebrew
Hindi
Hungarian
Indonesian
Italian
Japanese
Javanese
Kannada
Kanarese
Latvian
Lithuanian
Malayan
Mandarin
Marathi
Moroccan
Norwegian
Polish
Portuguese
Punjabi
Roumanian
Russian
Sindhi
Slovak
Spanish
Tamil
Turkish
Ukranian
Urdu
Yiddish
Yugoslav

Northern Electric scientists and engineers have learned to solve a wide range of communication and power problems as a result of Canada's peculiar geography. The ingenuity and innovative quality of Canadian scientists can well be used to solve similar problems in other lands.

Few countries have such extreme temperature conditions, ranging from a tropical 90° Fahrenheit in some parts of Canada in the summer, to lows of 30° to 40° below zero Fahrenheit in winter. Although nearly half of Canada's population lives in large urban centres, there are numerous small rural communities separated from one another by hundreds and sometimes thousands of miles. Whether large or small, highly advanced or less developed, in the tropical heat of summer or the arctic cold of winter, these communities must be serviced by systems that are both dependable and completely compatible. Company representatives are showing customers in many parts of the world how Northern Electric equipment can best meet their communications and power needs. Because of its long leadership in the field and of the international experience of its highly-trained engineers Northern Electric can be of service to any telecommunications or power customer, whatever his size, whatever his location.

warehouse facilities

Modern warehouse facilities help provide fast and efficient service.

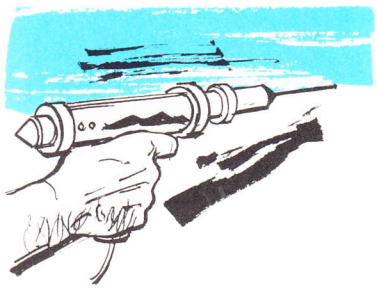
Distributing Warehouse in Vancouver, British Columbia.

installation

Northern's Installation Department offers customers a wide range of services associated with the installation of telecommunications equipment and wire and cable.

Ground preparation, choice and erection of buildings, pole lines and antennae, installation of buried cables, with all the attendant work and responsibility for engineering, procurement, marshalling, logistics, security, inspection, prove-in, line-up, shakedown tests, followed by maintenance and instruction of customers' personnel are among the services offered.

The Installation Department, with 1500 employees meets high quality standards. It is competent to plan and direct operations and has a strong field organization with a large number of seasoned men of proven reliability.



Installer testing Centrex equipment from the Master Test Frame.

wires and cables

ARMOURED CABLES

Interlocking:
- Galvanized steel, Aluminum or Copper

Double tape:
- Galvanized or ungalvanized steel or Aluminum

Single wire:
- Galvanized steel or Aluminum Alloy

Double wire:
- Galvanized steel or Aluminum Alloy

Basket Weave:
- Galvanized steel, Bronze or Aluminum

BARE WIRES & CABLES

Aluminum
Alumoweld
Bronze
Cadmium Copper
Copper
Copper Covered Steel
Galvanized Steel Strand

BUILDING WIRES AND CABLES

Flameseal types TW, TWU, TWH, TW Minus 40°F, TWU Minus 40°F, TW Nylon, TWU Nylon
Non-Metallic Sheathed Cable
- NMD-3 (Norel-x)
- NMW-10 (Norel-XPW)

Flexible Armoured Cable
- (Norel) AC, ACH

Flexible Armoured Lead Sheathed Cable
- (Norel) AC, ACHL
- R75 (Norheat)
- R60 (Nordamp)
- RW60 and R75 (Norall)
- RW75, R90, RW75 and R90
- RWU60, RWU75

CABLE LEADS-FOR:

Batteries
Dynamos
Electric signs
Furnaces
Motors and coils
Transformers

CONTROL CABLES

Thermoplastic insulated
Rubber insulated

CORROSION PROTECTION

Norprene Tape Protection (NTP)
Norprene Protection (NP)
Polyvinyl Protection (PVCP)
Polyethylene Protection (PEP)
Jute Protection (JP)

CUSTOM BUILT CABLES

To customers' requirements or specifications

MAGNET WIRE

MINE CABLES

Bore-Hole Cables with Head Servings
Mine Lamp
Mine Shaft
Mine Signal
"Pyrotenax" M.I. Cables
Teck Cables
Trailing Cables

MISCELLANEOUS COMMUNICATION WIRES AND CABLES

Annunciator
Antenna
Audio Frequency
Dictaphone
Hotel Radio
Microphone
Outdoor theatre
Radio
Television Cables
- Coaxial
- Composite Video Pair

MISCELLANEOUS DISTRIBUTION CABLES

Aerial Spacer Systems
Airport Lighting
Network
Neutral Supported Wire
Pre-assembled Aerial
Service (Triplex)
Service Entrance
Street Lighting

PORTABLE AND TRAILING CORDS AND CABLES

Cradle Center Mining Cable
Dredge Cable
Flexible Cords
Portable, Types W,G, SH-A,-B,-C,-D
Cab Tire, Types S, SJ, SO, SJO, Power Supply SW, SWO, SG, SGO
Welding—Electrode Holder or Extension Lead

POWER CABLES

Gas Filled
Gas Filled Pipe
Hollow Core Oil Filled
Oil Filled Pipe
Paper Insulated
Rubber Insulated
Submarine
Thermoplastic Insulated
Varnished Cambric Insulated

TRANSMISSION LINE CABLES

ACSR
Aluminum
Alumoweld
Copper
Copper Covered Steel
I-Beam Core

SIGNAL CABLES

Fire Alarm
Nurses' Call Systems
Police
Railway
Traffic

SUNDRY WIRES AND CABLES

Asbestos Covered
Equipment Wire
Fixture
Locomotive Headlight
Railway Car Wiring
Seismograph
Shot Firing
Stove
Thermocouple Extension Cable
Thermostat Control
Water Heater Cable

TELEPHONE CABLES

Armour and Protection
  Aerial Tape
  Buried Tape
  Gopher Tape
  Light Wire
  Single Wire
  Double Wire
  Jute
Exchange-Paired Cable
  Polyethylene Insulated
  Paper Insulated
Inside Wiring
  PVC Insulated
Interphone
  PVC Insulated
Sheaths
  Alpeth
  Lead
  Lepeth
  PAP
  PASP
  Polyethylene Jacket
  Stalpeth
  Stalplast
Stub
  Paper Insulated
  PVC Insulated
  Textile Insulated
Submarine
  Paper Insulated
  Polyethylene Insulated
Switchboard
  PVC Insulated
  Textile Insulated
Terminating
  Textile Insulated
  Dual PE-PVC Insulated
Toll-Paired Cables
  Polyethylene Insulated
Toll-Quadded Cables
  Paper Insulated
Toll Entrance
  Paper Insulated
  Polyethylene Insulated
  Multiple Coaxial

TELEPHONE CORDS AND CORDAGE

Desk Stand
Handset
Switchboard

TELEPHONE WIRES

Bridle Wire
Buried Service Wire
Cross-connecting Wire
Distributing Frame Wire
Drop Wire
Ground Wire
Inside Wire
Line Wire
Multiple Drop Wire
Office Wire
Rural Wire
Station Wire
Storm Wire
Switchboard
Tree Wire
Underground Wire
Urban Wire

WEATHER RESISTING WIRES AND CABLES

Aluminum
Copper
Copper Covered Steel
Norprene Covered
Polyethylene Covered
Polyvinyl Chloride Covered

telecommunications equipment

ALARM SYSTEMS

AMPLIFIERS
Baseband
Bridging
Carrier Frequency
Clamper
Microwave
Parametric
Voice

ATTENUATORS

BELLS & BUZZERS

BLOCKS
Connecting
Fuse
Protector
Terminal

BOXES
Battery
Cable Terminal

BRIDGES
Capacitance
4-Way 4-Wire

CABLE RACKS

CAPACITORS
Mica
Mylar
Paper

CARRIER EQUIPMENT
Cable
Open Wire
Radio Frequency
Trunk
Voice Frequency Telegraph

CASES
Apparatus
Loading

COILS
Heat
Induction
Loading
Repeating
Retardation
Toroidal

COIN COLLECTORS (PAYSTATIONS)
Prepay
Postpay
Semi-Postpay

CONNECTORS
Coaxial Cable
Waveguide

CONNECTOR CABLES

CORDS
Dial
Handset
Miscellaneous
Operators
Patching
Receiver
Switchboard
Telephone
Transmitter

CRYSTALS
Quartz

DIALS
Push Button
Rotary

DIODES
Germanium
Silicon
Zener

DISTRIBUTING FRAMES
Combined (C.D.F.)
Intermediate (I.D.F.)
Main (M.D.F.)

DISTRIBUTING RINGS

EQUALIZERS

FERRITES

FILTERS
Blocking (Carrier)
Bridging
Line
Low Pass, High Pass and Band Pass
Radio Interference
Separation (Microwave)
Telephone Set
Waveguide

FUSES
IndicatorAlarm Type
Non-Alarm Type
Tubular

GAUGES
Limit
Non-Magnetic Type
Spiral Spring Tension
Spring Checking
Thickness Gauge Nest
(Check Armature Air Cap)

GENERATORS
Hand (Magneto Telephone)
Microwave

HAND SET

HEAD TELEPHONE SETS

INDUCTORS

INTERPHONE SYSTEMS
Apartment
Business
Farm
Home
Nurse (Hospital)

JACKS
Both individual and shop mounted to meet all requirements

JACK MOUNTINGS

JACKS AND SIGNALS COMBINED

KEYS
Locking and Non-Locking Type
Push Button
Subscribers' Station
Universal Type

KEY TELEPHONE SYSTEMS

LAMPS
Key Telephones
Switchboard

LAMP CAPS

LAMP SOCKETS AND LAMP SOCKET MOUNTINGS

NETWORKS

PLUGS
Dummy
Miscellaneous
Operator's
Portable Telephone Plug
Signal
Switchboard

POWER PLANTS
Various Ranges for Telephone, Carrier, Microwave, Scatter and Key Telephone Systems

PRIVATE AUTOMATIC BRANCH EXCHANGES (P.A.B.X.)

PRIVATE AUTOMATIC EXCHANGES (P.A.X.)

PRIVATE BRANCH EXCHANGES (P.B.X.)

PROTECTORS
Line
Station

PROTECTOR MOUNTINGS

RECEIVERS

RELAYS
General Purposes (All Types)
Mercury Contact
Miniature
Polarized
Signal
Thermal
Wire Spring

RELAY RACKS

REPEATERS
Plug-In (Miniature)
Single Line
Telegraph
Telephone
Voice Frequency

RESISTANCES
Carbon Deposit
Wire Wound

RINGERS
Bell Chime
Telephone

SEMI-CONDUCTORS
Diodes
Transistors

SIGNALLING SYSTEMS

SWITCHES
Crossbar
Rotary
Step-by-Step
Telephone

TELEPHONE BOOTHS

TELECOMMUNICATIONS SYSTEMS
Carrier for Long and Short Haul
Crossbar Telephone Exchanges
Data Transmission
Dial Telephone Exchanges
Emergency Reporting
Microwave Radio Relay for Long and Short Haul
Radio Telephone
Scatter
Teletype

TELEPHONE EXCHANGES (AUTOMATIC)
Branch Automatic (Attended)
Private Automatic (Non-Attended)
Small and Large Crossbar Central Offices
Small and Large Dial Central Offices

TELEPHONE EXCHANGES (SWITCHBOARDS)
Common Battery
Console (Cordless)
Cord, Multiple
Cord, Non-Multiple (Magneto, Common Battery)
Cord, Universal

TELEPHONE LOUDSPEAKERS

TELEPHONE SETS
*Call Director
*Dial
For Noisy Locations
Hard of Hearing
*Local Battery Talking
*Magneto
*Manual Common Battery
Mine
Police
Portable
*Princess
Taxi

*Obtainable in Various Colours

TELEPHONE TABLES AND SHELVES

TELEPHONE TRANSMITTERS (CARBON)

TELETYPE EQUIPMENT

TERMINALS
Building Cable
Cable
Combined Telephone and Power Pedestal
Telephone Pedestal
Wire

TEST SETS

THERMISTORS

TOOLS
Miscellaneous for Telephone Maintenance

TRANSFORMERS
Auto
Input
Output

TRANSISTORS
Double Diffused Silicon Planar

TUBES, ELECTRON

VARISTORS

electronic equipment

FIRE ALARM SYSTEMS

Northern Electric Company specializes in municipal fire box systems. Many years of experience gained in this field enables the municipalities to rely on Northern Electric sales personnel for service. We also provide training courses in Fire Alarm Systems for customers' maintenance groups.

Control Units

Municipal Fire Alarm Central Office Control Units
Municipal Police Signal Control Units
Industrial and Institutional Fire Alarm Control Units
Industrial and Institutional Fire and Security Control Units

Fire Alarm Boxes

Municipal Fire Alarm Boxes
Industrial and Institutional Fire Alarm Boxes
Municipal Police Boxes
Industrial and Institutional Fire and Security Boxes

Recording and Alarm Apparatus

Punch and Print Recording Units for Fire Alarm and Police Signal Systems
Single Stroke Gongs
Vibrating Gongs
Compressed Air Diaphone Plants

SOUND SYSTEMS EQUIPMENT

We supply a complete range of speech input equipment. Acoustic layouts for auditoriums, broadcasting studios and recording studios form a major part of the services offered.
Microphones
Amplifiers
Intercommunication Telephones
Loud Speaking Intercoms
Speech Input Consoles
Equipment Racks
Impedance Transformers
Volume Indicators
Monitoring Equipment
Program Transmission Panels
Pre-Amplifiers
Program Sound Bays

TELEVISION AND BROADCAST EQUIPMENT

Northern Electric offers many years of experience in the broadcast industry, and through a detailed program of research and development continues to offer equipment of a quality demanded by this industry—package radio and television stations to meet the requirements of any community and any budget.
Speech Input Consoles
Microphones
Electron Tubes
Rectifiers
Broadcast Monitoring Equipment
Turntable Assemblies
Sound Systems
Remote Mobile Equipment
Package Control Rooms
Master Control Centres
Video Monitors

TRAFFIC SIGNAL SYSTEMS

Traffic equipment, ranging from isolated intersections on a highway to programmed traffic movements throughout a metropolitan grid system, is available from Northern Electric. Our field staff is composed of factory trained personnel. We also provide training courses in Traffic Control systems for customers' maintenance groups.

Controllers

Non-actuated Controllers
Semi-actuated Controllers
Full-actuated Controllers
Computer type Master Controllers
Pedestrian Controllers

Detectors

Magnetic Type Vehicle Detectors
Radar Type Vehicle Detectors
Pressure Type Vehicle Detectors
Pedestrian Push Buttons

Signals

8" and 12" Signal Heads
Signal Fittings for pole and pedestal mounting

If any further information is required about this Company or about any of the products referred to in this booklet, please address your enquiry to a branch office or to the Public Relations Department, Northern Electric Company, Limited, P. O. Box 6123, Montreal, Que.

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