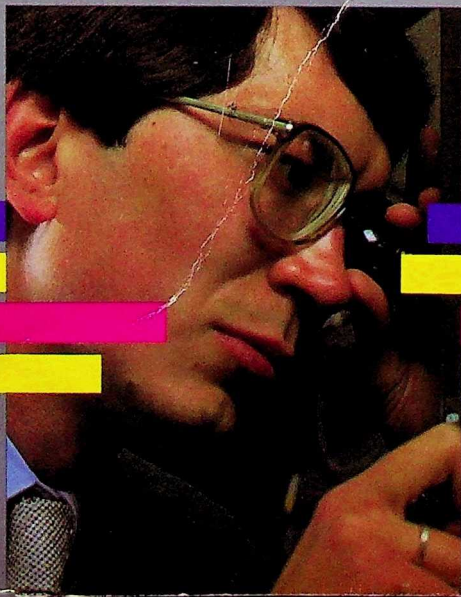
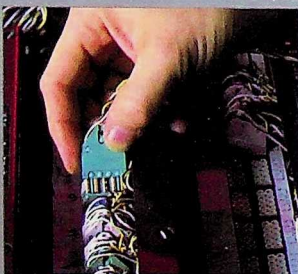
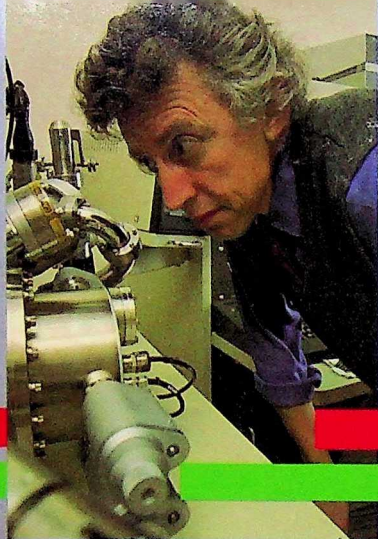
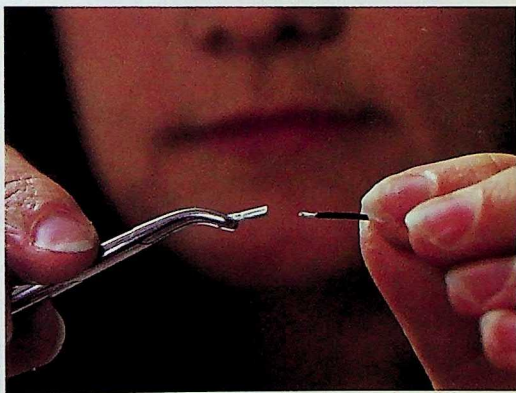


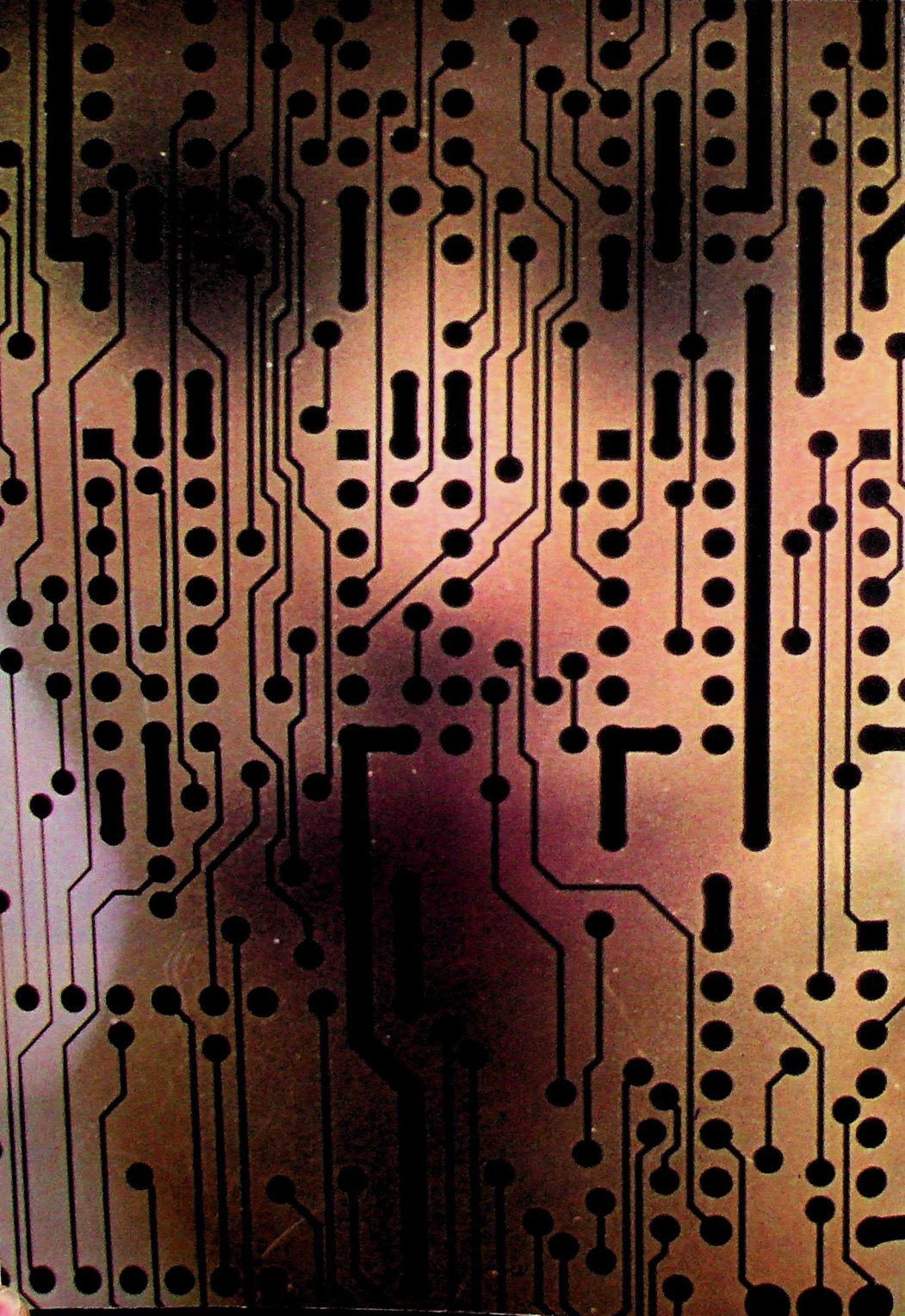
BNR 

A Guide to BNR Ottawa



A Guide to BNR Ottawa





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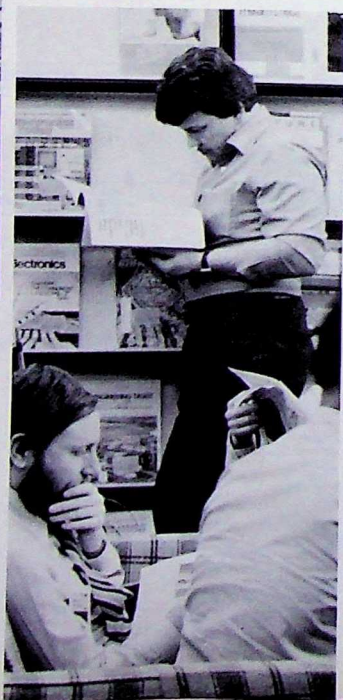
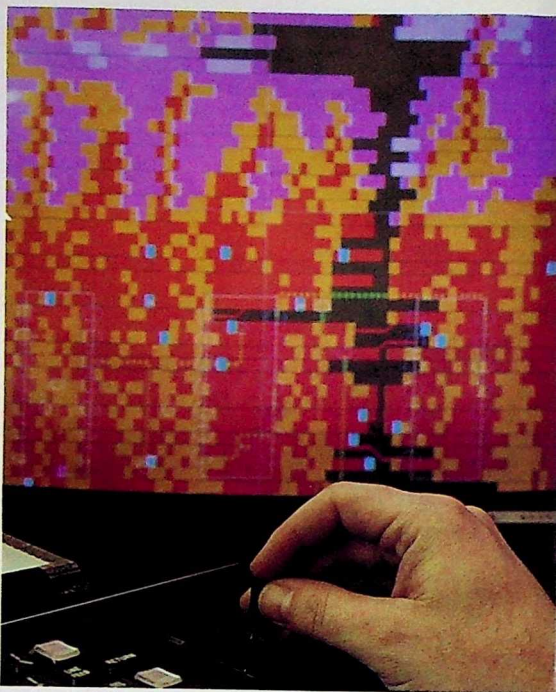
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20.0 BNR/NT Club

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INTRODUCTION

1.1 INTRODUCTION

The information you'll find in this handbook has been assembled in a convenient and easy format to help you to better understand BNR. It explains how BNR is organized, how it fits into a large corporate structure, and how we do business. More importantly, the handbook will give you a feel for the importance we place on our employees, and how you fit into the BNR community.

Our official business practices are documented in a series of BNR policies and procedures; these form the basis for most of the information contained in this handbook. For additional information, refer to the appropriate BNR policy or procedure, or contact your manager. You'll find an index of policies and procedures in Corporate Procedure (CP) 1102.02. You'll also find a directory of services in the BNR telephone book.

1.2 CORPORATE STRUCTURE

The following chart shows the relationships between the various affiliated companies. The chart is not intended to denote legal or parent-subsidiary relationships. It simply reflects the administrative organization of BNR.

1.3 NORTHERN TELECOM LIMITED

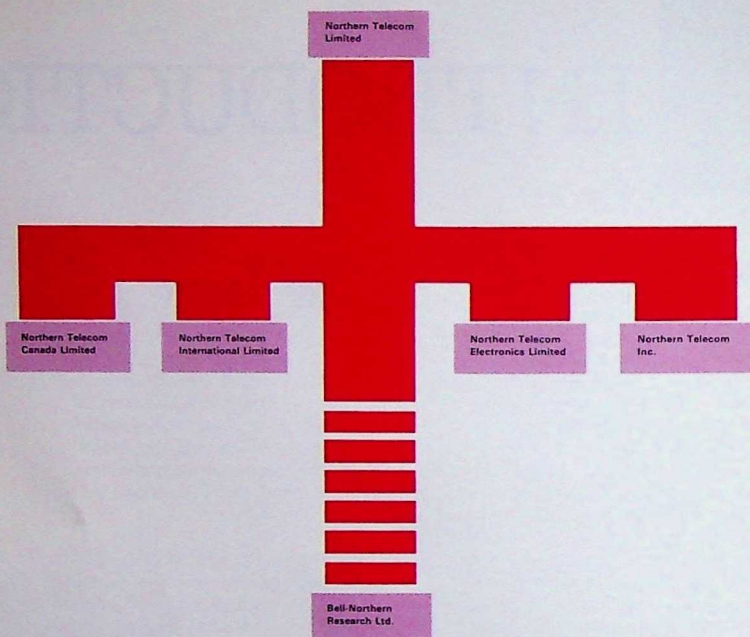
Northern Telecom is BNR's major shareholder and parent company. A ceaseless search for innovative products and technologies has resulted in the production of designs that have made Northern Telecom the major supplier of telecommunications equipment in Canada, and the second largest in North America.

Northern Telecom is a multi-billion dollar company and employs more than 43,000 employees. It operates manufacturing plants located in Canada, the United States, the Republic of Ireland, Turkey, Brazil, the United Kingdom, and Malaysia.

Principal products include business communication equipment, electronic office systems, subscriber apparatus, cable, outside plant, test equipment, central office switching, as well as power and transmission equipment.

You may already be familiar with some of the many BNR products and systems which have been introduced into the marketplace, for example, packet switching systems like the SL*-10, the new generation of switching and transmission systems called DMS*, the SL-1, RD-4A, Vantage*, Displayphone* and Harmony* phone.

*Trademarks of Northern Telecom Limited



1.4 BELL CANADA

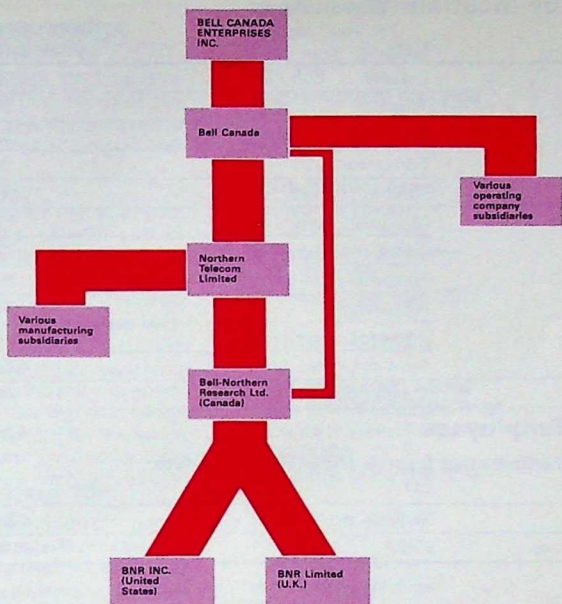
Bell Canada is one of the largest telecommunications companies in Canada. It employs more than 53,000 people and is the principal supplier of telecommunication services in the provinces of Ontario, Quebec, and parts of the Northwest Territories. Bell Canada is a parent company to BNR, and its 10 million customers benefit from the products, systems, and services designed by BNR and manufactured by Northern Telecom.

1.5 HISTORY OF BNR

As North America's largest privately owned research and development company, BNR has achieved world renown for its innovative designs and applications of technology.

Its history is an evolution based on technological opportunity and market awareness.

The Northern Electric Research and Development Laboratories were created in 1958 to meet the needs of its parent company Northern Electric (now Northern Telecom), and those of the Canadian telecommunications industry in general. Out of this emerged BNR, created as a separate company in 1971 to support the international sales effort of Northern Telecom.



Through the development of its own technology and products, BNR has helped make Northern Telecom the largest equipment supplier in Canada, second largest in the U.S., and sixth largest in the world.

When BNR was established, less than 14 percent of Northern Telecom's revenue was from proprietary designs. Today, the figure exceeds 90 percent.

Today, BNR is a market-driven company, committed to world leadership in the application of technology, and to developing high growth products and services for communications systems.

1.6 THE COMING DECADE

The digitization of voice has turned the telecommunication network into a forum within which total communication can occur.

This capability leads to challenging possibilities: the transmission of all kinds of information over the network; the development of communications products that can process different forms of information simultaneously; the simultaneous processing and presentation on one terminal of information from different sources; the development and introduction of very complex conferencing arrangements that combine voice, video, and data; the gathering and processing of data for use first in the business environment, then in the home; and the use of a telecommunication network as an advertising medium whose terminals can transmit, select, and retain specific information required by the user.

More foresight, boldness, and analytical ability than ever before will be required in order to orchestrate technology to meet the increasingly complex and diverse needs of a rapidly expanding and better-informed market.

At BNR managing innovation for transition is a way of life!

Employees by location (1984 budget)

Country	City	Employees (year end)
Canada	Ottawa	2592
	Toronto	140
	Montréal	155
	Edmonton	98
	Total in Canada	2985
United States	Mountain View	435
	Ann Arbor	226
	Research Triangle Park (RTP)	123
	Richardson	240
	Atlanta	14
	Total in United States	1038
U.K.	Maidenhead	42
Total BNR Employees		4065

The following comparative figures show BNR's growth

	1971	1984 (budget)
Employees	1477	4065
Revenues/Expenses	\$38M	\$370M

1.7 THE ROLE OF OUR LABS

The role and objectives of our labs in the U.S., Canada, and the U.K., are a direct response to the future challenges facing BNR.

Our competitive strength and success come not only from the ability of our labs to manage innovation distinctively, but also from three other key factors — our market proximity, the diversity of our specialized objectives and talents, and the integration of these objectives and talents into a common mission.

Our locations make it possible for us to anticipate market needs, and as such, they are strategic to BNR. The diversity of focus and strengths in our

labs broadens our overall potential scope, and at the same time, refines our specialized capabilities.

Although each lab has its own established objectives, combined they represent the strategic direction of BNR. BNR expects to achieve world leadership — and a network of labs is a key element in our strategy to achieve it. BNR is one company, developing and building on the knowledge and expertise of its individuals, project teams, and labs.

1.8 DESIGN ECONOMICS

In the coming decade, BNR must be able to compete on cost. We must give our own product lines the competitive advantage to endure future cost competition.

Our design economics will be a major fact in the success of BNR and its parent companies. BNR's strength has always been in the application of technology. We have achieved our greatest success in areas where we have established product differentiation such as the DMS Family of digital switching products. This depends on our ability to understand where the technology is going and to exploit it for the future needs of customers. The result is rapid sales growth, bigger margins, and cost effectiveness over time. We must also design effectively and efficiently. Designs must be manufacturable. We must learn how to design low volume codes better because they've given us market penetration, increase our use of silicon in gate array and standard cell array, reduce the number of components in our designs, and be able to predict our manufacturing yield. Designs we do again must be better to ensure market leverage. These thrusts make good financial sense to our business.

1.9 MAILING ADDRESSES

Canada

BNR (Ottawa)

P.O. Box 3511 Station C
Ottawa, Ontario
K1Y 4H7
Telephone (613) 727-2000

BNR (Toronto)

522 University Avenue
14th Floor
Toronto, Ontario
M5G 1W7
Telephone (416) 598-0196

BNR (Montréal)

3, Place du commerce
Verdun, Québec
H3E 1H6
Telephone (514) 765-8888

BNR (Edmonton)

50 Karl Clark Rd.
Edmonton, Alberta
T6H 4J9
Telephone (403) 438-2666

U.K.

BNR (Maidenhead)

St. Mary's House,
17 St. Mary's Walk,
Maidenhead, Berkshire
U.K. SL6 1QX
Telephone (44) 628-72921

United States

BNR (Mountain View)

685A East Middlefield Road
Mountain View, California
94043 USA
Telephone (415) 969-9170

BNR (Ann Arbor)

P.O. Box "D"
100 Phoenix Drive
Ann Arbor, Michigan
48104 USA
Telephone (313) 973-4000

BNR (Atlanta)

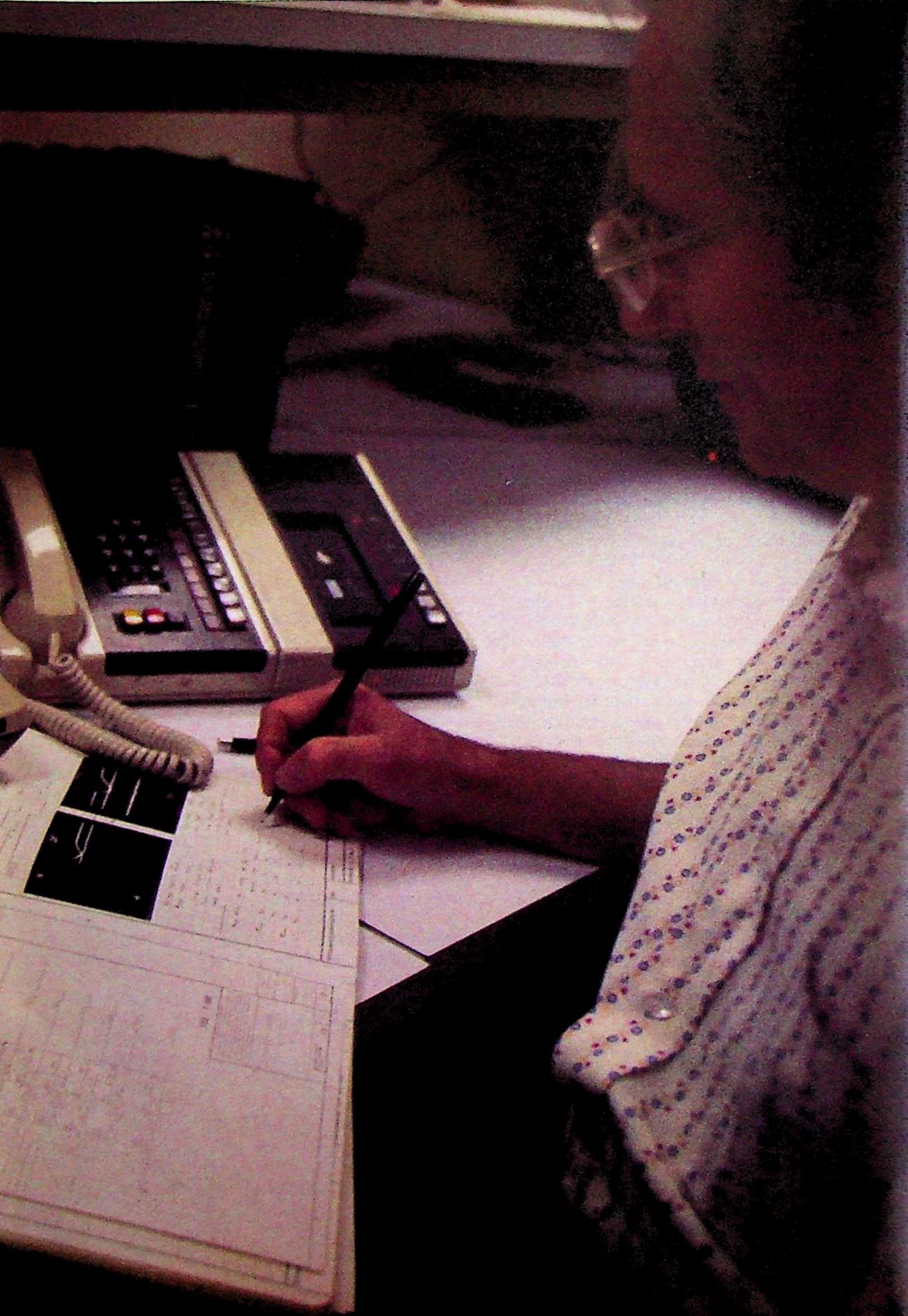
4170 Ashford
Dunwoody Rd. N.E.
Suite 450
Atlanta, Georgia
30319 USA
Telephone (404) 255-3112

BNR (RTP)

500 Perimeter Park Drive
Morrisville, North Carolina
27560 USA
Telephone (919) 549-5000

BNR (Richardson)

1201 East Arapaho Drive
Richardson, Texas
15081 USA
Telephone (214) 234-7500



ORGANIZATION

Research and development at BNR is carried out in three major groups, which are further subdivided into divisions and/or specialized functional groups. The research and development organizations are supported by three groups — Human Resources and Administration, Finance, and Corporate Development. The divisional structures are flexible so that as technology changes, organizational structures change. Specialized groups provide the diverse skills required for successful product development. While organized under specific divisions for reasons of resource management, their skills and services are available company-wide, as described in Section 16.

Currently, BNR is organized as follows:

- Network Products
- Office Products
- Component Development
- Human Resources and Administration
- Corporate Development
- Finance

The structure and mission of each is described on the following pages.

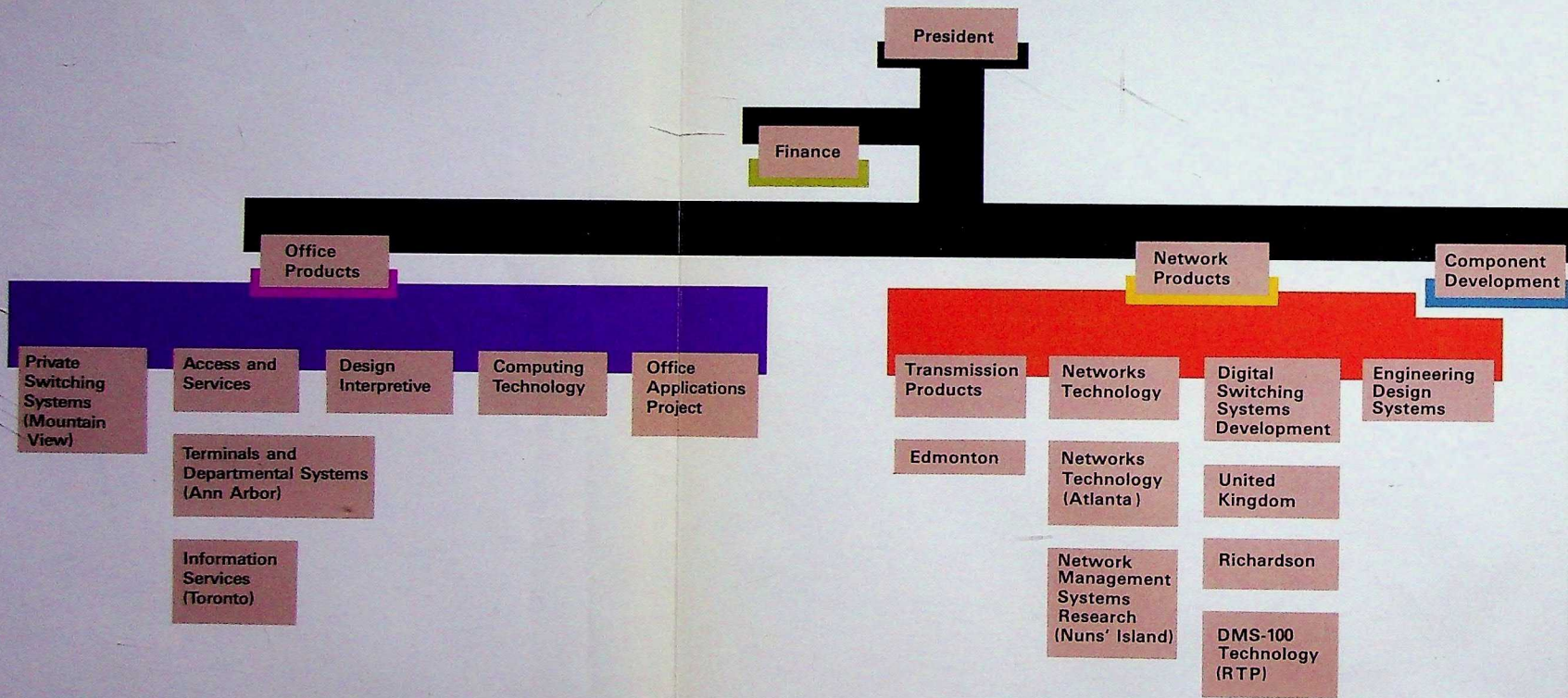
2.1 NETWORK PRODUCTS GROUP

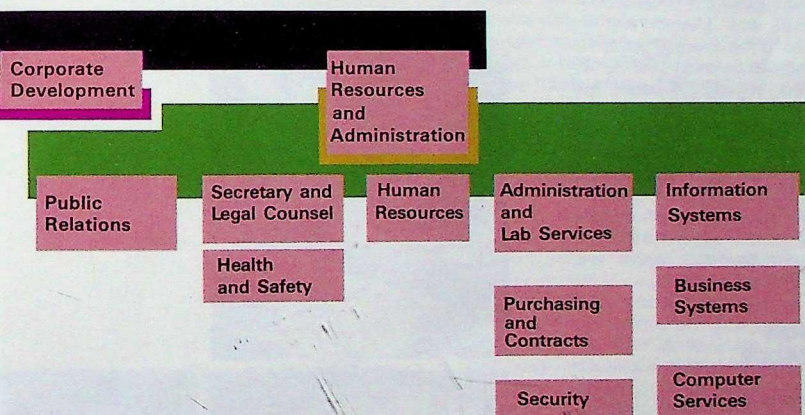
The group is primarily concerned with the development of new transmission and switching products based on system requirements, which have been researched, planned, and specified by the Networks Technology Division.

The following divisions and organizations form the Network Products Group:

- Transmission
- Digital Switching
- Networks Technology
- Engineering Design Systems

Organizational Structure BNR





2.1.1 TRANSMISSION

The Transmission Products Division, located in Ottawa and Edmonton, is responsible for the development of a series of products which transmit intelligence and interconnect all the various elements of the network. The division conducts research in the field of laser technology and designs a wide range of products, such as: digital microwave radio (DRS8, RD4); fiber optic systems (FD-2/3/135) mono- and multi-mode fibers; digital pair cable transmission (LD-1/IC); multiplexers (DM-12/13); and connection/protection systems for all transmission technologies.

2.1.2 DIGITAL SWITCHING

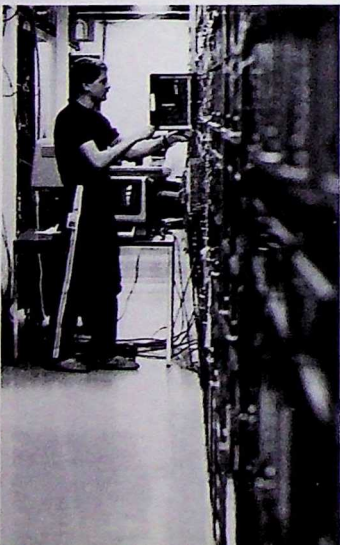
The division, located in Ottawa, RTP, Richardson, and Maidenhead, is responsible for the development of the Digital Multiplex System (DMS) family of switches, serving the public and large private networks, and handling both voice and data. The development is based on the latest software/silicon/fiber technology advances and is concerned with a range of technical challenges such as VLSI design, switching system architecture, fiber optics, computer-aided design, and multi-width band switching.

2.1.3 NETWORKS TECHNOLOGY

The Networks Technology Division, located in Ottawa, RTP, Montréal, Edmonton, Mountain View, Richardson, Atlanta, and Maidenhead, identifies, researches, and explores future opportunities in communications services and products. The division then relates future opportunities in communication services, products, and systems requirements to the needs of both the end-user market and operating companies. Through systematic data gathering and analysis, the division identifies and synthesizes future telecommunication opportunities in network architecture, hardware systems, and communication services.

2.1.4 ENGINEERING DESIGN SYSTEMS (EDS)

The Engineering Design Systems group works on the development of software tools which can be used to capture and standardize new and existing designs, and to prepare manufacturing and testing information and/or processes. These software packages increase and/or enhance design accuracy, integrity, and related management control, while they decrease design cycle time and subsequent revisions. One of the group's prime products is the CBDS (Circuit Board Design System) software package.



2.2 OFFICE PRODUCTS GROUP

Northern Telecom has announced its intention to develop the "OPEN World". OPEN World is a marriage of computers, communications, and technology which uses the office products and technology developed by the Office Products Group. The line of products and systems includes computer and telephone display terminals, integrated voice/data terminals, workstations, small key systems, PBXs, videographic products, teleconferencing, and various other office systems and data networks.

The following divisions and organizations form the Office Products Group:

- **Private Switching Systems**
- **Access and Services**
- **Computing Technology**
- **Design Interpretive***
- **Office Applications Project**

2.2.1 PRIVATE SWITCHING SYSTEMS

The Private Switching Systems Division in Mountain View develops office communications systems which handle combined voice and data. The sophisticated SL-1 business communication system is a major ongoing project. Increasingly, such systems are being integrated into private networks and are being used in conjunction with information processing applications. Located in Silicon Valley, the Mountain View laboratory also allows BNR to monitor developments in that area of the world.

*Trademark of Bell-Northern Research Ltd.



2.2.2 ACCESS AND SERVICES

This division has groups in Ann Arbor, Toronto, and Ottawa, and is responsible for the development of a series of office products and systems.

The Ann Arbor groups are prime on terminals and very small systems. Projects include a small, integrated voice and data office controller, a new proprietary terminal for NT, and ongoing support to NT Advanced Office Systems Division on existing distributed data processing and on-line equipment. Mechanical packaging is also done in Ann Arbor.

The Toronto groups are prime on information services development. Projects include software for SL-1, the C&E contract (office communication system for the Customs & Excise Department of the Canadian government), and office communications research for Bell Canada.

The Ottawa group develops common network voice terminals and injects technology into our new products. Projects include SL digital terminals; digital telephony; image processing; and mechanical packaging of office products.

2.2.3 COMPUTING TECHNOLOGY

The Computing Technology group develops hardware and software system designs that are used by other BNR design groups as a base for a variety of product developments. These designs are known as the XMS system and include operating systems software (the X-system), programming language design (BNR Pascal), and data base management software. The Computing Technology Group is concerned with the ongoing support and distribution of the XMS designs, as well as their evolution to include capabilities such as high resolution color graphics, optical fiber-based local area networks, and advanced software techniques. (Also see section 16.2.1.)

2.2.4 DESIGN INTERPRETIVE

Design Interpretive focuses on systems and equipment interface, ergonomics, user needs assessment, speech and signal processing, experiential behavior, graphics, and industrial design. Sometimes referred to as humanists among technologists, these staff members, who work in Ottawa, concentrate on the introduction and consideration of human factors in product design.

2.2.5 OFFICE APPLICATIONS PROJECT

The Office Applications Project, located in Ottawa, is concerned with the application of newly-developed office products and systems. Field trials are carried out in various internal and external business environments.

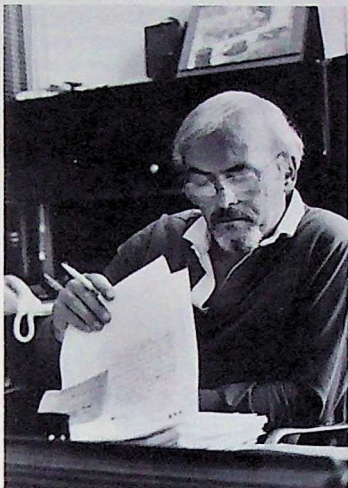
2.3 COMPONENT DEVELOPMENT

The Component Development Group is located in Ottawa and West Palm Beach, and is responsible for the application of microelectronic technology to all BNR designs.



Staff members concerned with custom LSI design and application provide new and advanced components for products designed at BNR and manufactured at NT.

The Silicon Design Technology group supports company-wide application of



the Silicon User Design System (SUDS) whereby chips are designed directly by user groups.

The development and support of design aids for both the full-custom Silicon Design System (SDS) and SUDS is carried out by the IC CAD/CAM departments.

The Power Group develops custom power systems for various products designed at BNR.

This division enjoys close ties with Northern Telecom Electronics which manufactures our proprietary micro-electronic designs.

2.4 HUMAN RESOURCES AND ADMINISTRATION

The Human Resources and Administration Division supports the R&D effort by providing a framework of professional and administrative services. Divisional functions include all aspects of human resources management, information systems, legal counsel, health, safety and environment, public relations, technical education, technical information, office and building services, and facilities engineering.



2.5 CORPORATE DEVELOPMENT

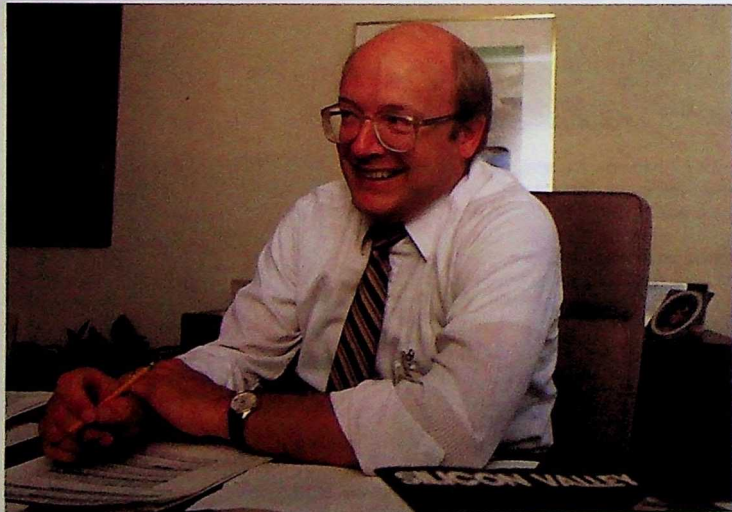
Corporate Development positions BNR to apply technology to address Northern Telecom's future business opportunities. To maintain an accurate view of business direction, Corporate Development co-ordinates with the responsible line groups the preparation of a rolling five-year strategic plan.

Because future products may not necessarily fall into current divisional responsibilities, BNR sponsors through Corporate Development the Capability Program to identify and develop technologies and application ideas. The Capability Program is funded through a tax on BNR revenues, and is executed both by dedicated groups and by line groups. The individual programs are managed by Corporate Development through a matrix structure. An extensive university liaison is maintained to assist with research and to develop future talent.

In addition, Corporate Development is responsible for quality and the direction of supporting automated design and transfer.

2.6 FINANCE

The Finance Group is responsible for establishing financial policy, monitoring adherence, designing/selecting financial systems to meet the needs of the business, and providing accounting and treasury services including taxation, payrolls, and accounts payable. In addition the Finance Group analyzes operating results, provides financial guidance to management in their review of investment opportunities, co-ordinates the setting of budgets and revisions thereto (forecasts), and plays the key interface role on financial matters with NTL and other parent/subsidiary companies.



2.7 ORGANIZATIONAL UNITS (FINANCIAL AND ADMINISTRATIVE STRUCTURES)

A departmental hierarchy has been developed for the efficient management of BNR resources. This hierarchy is depicted at right and described further in the following pages.



ORGANIZATIONAL RELATIONSHIPS OF BNR DEPARTMENTS

2.7.1 DESCRIPTION OF BNR ORGANIZATIONAL UNITS

COST CENTERS (C.C.)

Each department or basic functional organizational unit is considered to be a cost center in BNR. A cost center or department number (e.g. 1C21) is assigned to each organizational unit, with the first digit representing the division to which the department reports. In Financial Systems, costs are accumulated at this level.

RESPONSIBILITY CENTERS (R.C.)

A responsibility center is a consolidation of cost centers or departments. Responsibility for financial planning, budgeting, and forecasting is assigned to this organizational unit.

REPORTING UNITS (R.U.)

A reporting unit is a consolidation of responsibility centers, created primarily for financial reporting to senior management in the company.

DIVISIONS (DIV.)

A large group of departments (C.C.s, R.C.s and R.U.s) form a division, usually grouped around a state-of-the-art technology or a particular lab configuration.

PRODUCT GROUPS (P.G.)

These are collections of divisions, devoted to the development of major groupings of marketable products.

COMPANY

This represents all BNR operations in all locations.

2.7.2 LINE VERSUS SUPPORT R.C.s

In addition to the hierarchical structures we've just described, BNR departments are delineated as "line" or "support". Line departments focus primarily on R&D activities funded by clients. Support departments provide a wide variety of services ancillary to the R&D process, and render these services on a "pay as

used" basis. Where cost assignment to projects is not practical, cost is allocated as appropriate to all R.C.'s, absorbed in loaded labor rates and billed to clients based on project activity.



PHILOSOPHY

A black and white photograph of a man with glasses looking at a computer monitor in an office setting. The man is in the foreground, slightly out of focus, looking towards the camera. In the background, a computer monitor is visible on a desk, and the office environment is softly lit.

BNR has established a worldwide reputation as a leader in telecommunications research and development. Through the years, we have remained dedicated to our goal of technological excellence by adhering to three basic values which we feel inherently reflect our way of doing business. These ideals are leadership in the application of technology, innovation for market advantage, and excellence in design. In addition, BNR's management philosophy outlines our commitments to our customers, our people, and the community at large.

You'll find more information on this subject in Our Mission and Management Philosophy. Ask your manager or human resources specialist for a copy.



MANAGEMENT OF HUMAN RESOURCES

4.1 ORIENTATION

Whether you're new to BNR or have been recently transferred from another location, you'll benefit from our orientation program.

This program, conducted regularly at all BNR locations, will give you the opportunity to learn how we function as an organization. Orientation gives you an overview of the organization, details on BNR's comprehensive benefit package, and an introduction to other company programs such as security procedures.

You'll meet the people best able to answer your questions on BNR, now and in the weeks to come.

4.2 CODE OF BUSINESS ETHICS

4.2.1 CORPORATE RESPONSIBILITY

BNR strives to attract and retain high caliber people and to provide a creative working environment in keeping with our world class reputation.

BNR is committed to fair policies regarding compensation, promotion, and career development, taking into account your capabilities and contribution. BNR's salary levels are comparable to those of the research community and other related industries. Every attempt is made to award promotion strictly on the basis of merit and without favoritism or bias.

BNR has a health and safety policy which is intended to protect and promote your health and safety on its

premises. Managers and employees have responsibilities in the implementation of this policy (see CP 1340).

In addition, you can expect a genuine concern for you and your family. This concern is expressed in the BNR Benefit Plans, which are intended to provide a base for your personal and family security.

In return BNR expects that you will bring to your job your best skill and effort, as well as your creative ideas.

4.2.2 EMPLOYEE RESPONSIBILITIES

4.2.2.1 MOONLIGHTING

As a rule, BNR will not object should you opt to supplement your income outside business hours; however, any such activity must neither interfere with your normal responsibilities and the performance of your regular duties, nor may it involve or use specific knowledge, services, property, and personnel proprietary to BNR or its parent companies. Should you be engaged in external income earning activities, inform your manager and obtain his or her consent.

4.2.2.2 CONFLICT OF INTEREST

You must declare and file a report with your manager if you have any financial interests or personal involvement with a supplier, competitor, or client of BNR or NT. The vice-president responsible will then decide whether a conflict of interest exists and determine BNR's position in the case (see C.P. 1552.01).

4.2.2.3 HEALTH AND SAFETY

Managers and employees are both responsible for a healthy and safe workplace. You each have roles to play (refer to the section on Health, Safety and Environment). While you have a responsibility to report hazardous situations and follow safe procedures, you also have the right to refuse work that endangers you or your colleagues. Health and safety legislation differs in each province or state so your specific rights and responsibilities will vary depending on the location of the BNR facility which employs you. BNR endeavors to apply its health and safety policy consistently throughout the labs, subject to the requirements of local laws.

Contact your human resource manager, Information Resource Center, or Health, Safety and Environment Department for more information on the legislation which affects you.

4.2.2.4 INFORMATION

Classified or proprietary corporate information is of great value to BNR. Be aware of this and safeguard BNR's scientific and commercial advantages over our competitors.

Any BNR employee who uses corporate information for personal gain, or for the benefit of others who are not entitled to receive this information, is open to disciplinary action and may be dismissed.

4.2.2.5 FUNDS AND RECORDS

Various corporate procedures outline how to handle corporate funds. Follow these clear guidelines when you obtain authorization. You should account for expenditures, and maintain relevant records. Contravention of these rules (that is to say, falsification of records) may result in disciplinary action, including dismissal.

4.2.2.6 CORPORATE ASSETS AND SUPPLIES

You may, on occasion, borrow BNR equipment for your personal use. Make sure you have obtained authorization before you remove equipment from BNR premises, and remember that corporate assets and supplies, most particularly BNR computing services, are not to be used for personal gain. Package passes are required to identify items hand carried off the premises (see Section 19.19).

4.2.2.7 BNR SERVICES

BNR provides in-house services designed to help you carry out the company's business. However, some services (library, mail, and telephone, for example) may be put to personal use. Personal long distance calls on BNR lines should be placed only when absolutely necessary and on condition that you reimburse the company. Make sure there are enough stamps on personal letters before you drop them in to the BNR mail system. And be aware of current rules when you borrow material from the library.



4.2.2.8 PROTECTION OF BNR PROPERTY

BNR is adequately protected under a blanket bond which insures the company against theft of money or property by its staff. However, you are still personally liable should you commit a crime against BNR's personal property.

4.2.2.9 IDENTIFICATION BADGES

The protection of information and knowledge is vital to the competitive strength of BNR and its parent companies. For security reasons, you are given an identification badge when you join BNR. Wear it at all times while at work and safeguard it against loss, misuse, or theft (see Section 14).

4.2.2.10 BORDER CROSSING

When travelling on business for BNR, or if you are relocating, it is your responsibility to respect immigration and customs regulations. Please ensure that the proper documentation is prepared for yourself and, if required, for the shipment of personal or company items such as PCs or cameras. If you need assistance in determining the documentation you may require for border crossings, please contact the Relocation Department in Ottawa; your local human resources manager in other locations; or the customs manager in the Purchasing Department in Ottawa.

4.3 TIME OFF, PERSONAL BUSINESS

Normally, you should attend to personal matters outside working hours. However, this is not always possible, and a short absence for reasons other than illness may be unavoidable. Advise your manager, who will decide whether the leave requested will be

paid, unpaid, or debited against vacation entitlements. In certain cases, you will be asked to make up the time taken.

Time off is discretionary, and is distinguished from holidays or statutory leave, discussed in Section II. Time off may be granted for the following reasons:

COMPASSIONATE LEAVE

Compassionate leave is limited to three (3) days with pay in the event of death in the immediate family. In addition, leave may be extended to five (5) days should you be responsible for funeral arrangements or should extensive travel be involved. Such additional leave is granted at your manager's discretion.

JURY DUTY/COURT ATTENDANCE

If called for jury duty or subpoenaed as a witness, BNR will pay regular salary as long as is necessary.

ELECTION DAYS

When working hours conflict with the minimum time allocated to vote (as specified in the various election acts) you may take leave with pay in order to fulfill your civic responsibilities.

PERSONAL LEAVE

You may take time off with pay to avail yourself of external professional services not normally available outside regular working hours. Your manager may ask that you make up the time lost.

4.4 PERSONAL FILE

Your personal file, which the Human Resources Department keeps up-to-date, contains information such as benefits, letter of offer, performance evaluations, salary changes, etc. You may see this file on request.

4.5 CHANGES IN PERSONAL STATUS

Advise your manager and the Human Resources Department of any change in address, telephone number, marital status, number of dependents, etc., since some of these changes may affect your benefit entitlements, and the handling of your claims. This information can be critical in case of emergency.

4.6 CONCERN RESOLUTION

Discuss work related issues with your manager on a regular basis in order to resolve your particular concerns as they arise.

You may also contact your human resources manager directly. If you're still not satisfied, document your concern and initiate discussions with senior management through your immediate supervisor (see CP 2530.01).



4.7 PARKING FACILITIES

Where possible, BNR provides free parking for employees. Access roads and restricted areas must be kept free at all times, however, and you must adhere to all posted regulations regarding speed, fire lanes, parking privileges, etc. You are also encouraged to register your car license with the security service in order that you may be notified should an emergency arise. Registration forms are available at any security desk.

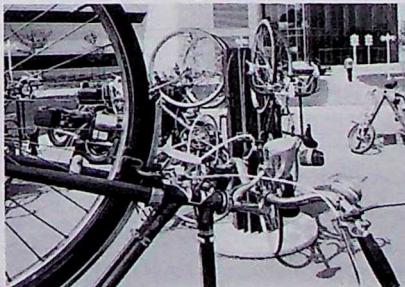
4.8 LOST AND FOUND

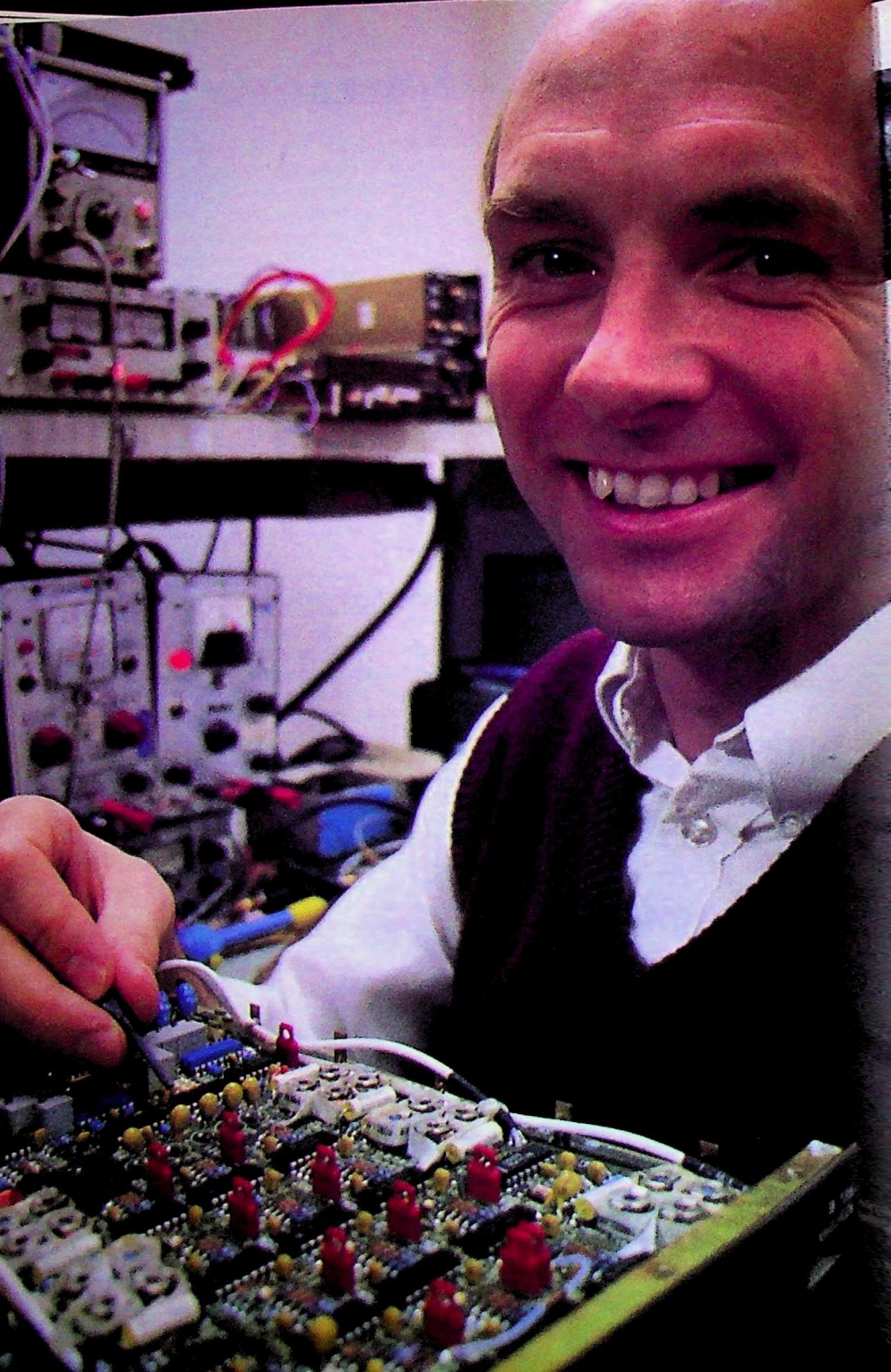
If you lose or find an article, contact one of the security desks, where a master record is kept of lost and found articles.

4.9 WORKING HOURS

In the R&D field, ideas do not occur solely while you are at work. Although the regular working hours are from 8 to 4, Monday to Friday, with half an hour off for lunch (37 1/2 hour work-week), creativity is not an 8 to 4 activity. Many of our employees make specific arrangements with their managers for variable work schedules which better accommodate their access to BNR services and facilities. However, you and your colleagues rarely work in total isolation, so interface during regular working hours is also essential to coordinate your work with others.

During working hours, your activities should be directed towards BNR's goals. You are expected to contribute creative ideas and to maintain a stimulating working environment.







EMPLOYMENT

BNR must attract, retain, and develop the best qualified people available in order to achieve its technical and economic objectives. To that end, we are committed to promotion from within and candidates are normally considered in the following order: internal, intercompany, and external.

5.1 CAREER OPPORTUNITY POSTING

Whenever possible, we prefer to fill vacancies from within. A list of openings is posted regularly on notice boards; information on intercompany openings is also posted. If you are interested in applying, you should contact your staffing specialist in Human Resources. Do discuss a potential move with your manager before any formal interview takes place, though.

5.2 INTERCOMPANY TRANSFERS

Internal or intercompany transfer requests may be initiated by you or your manager. Once a transfer is agreeable to all concerned, you, your manager, and Human Resources will work together to make it happen.

5.3 EMPLOYEE REFERRAL

As part of their employment, BNR employees are asked to keep a lookout for suitable candidates for the company. Regular full-time employees, with some exceptions, are eligible to participate in the Employee Referral Award Program. Eligible employees receive a cash award for referring to BNR an individual who, as a result of

the referral, becomes a regular full-time employee. However, certain procedural and policy requirements must be met. For instance, referred candidates must qualify for technical professional (MSS) or technical managerial positions within the company. Full details are available from your employment specialist in Human Resources (see CP 2109.01 in Canada or CP 2109.02 in the U.S.).

5.4 EMPLOYMENT OF RELATIVES

BNR does not normally employ relatives in positions with a direct reporting line. This policy acknowledges the sensitivity in handling company proprietary and confidential information, and strives to minimize problems of supervision, security, and morale. When employees become relatives while on the BNR payroll, each situation is handled on an individual basis, according to reporting relationships and the position to which each is assigned (see CP 1552.03).

5.5 BRIDGING OF SERVICE

If you have worked for BNR and/or its parent companies in the past, you are eligible to receive credit for such service as follows:

- If the intervening period is less than one year, previous service will be recognized after a period of re-employment equivalent to the break in service.
- If the intervening period is one year or more, previous service will be bridged after 12 months of employment.

You must apply to your Human Resources Department for bridging of service, to ensure the proper verification of past service.

5.6 TERMINATION OF EMPLOYMENT

You are required to give at least two weeks' notice, in writing, when resigning. An exit interview will be conducted by your local human resources representative. Employees leaving BNR must sign a Certificate of Compliance in accordance with the policies related to the Invention and Trade Secret Agreement. It is the responsibility of your immediate manager to collect from you your computer password; any books, papers, and reports belonging to BNR; desk and file keys; and I.D. badge. As well, your manager must sign your termination clearance. You will also be asked to settle any outstanding accounts with the Finance Department. Your final paycheck will reflect what is owed to you for time worked, overtime, and make-up time for the period prior to termination.

5.7 EMPLOYEE RELOCATION ASSISTANCE

When employees are transferred from one city to another at BNR's request, relocation expenses are paid for by BNR. In addition, BNR may offer qualified employees various housing subsidy programs designed to ease the burden of marketing their home.

Wherever possible, this assistance is offered to employees as an after-tax benefit (see CP 2309.01).

5.8 EMPLOYEE PROFILE

An Employee Profile is a concise summary of education, experience, and training. This information is a segment of the human resource inventory, and is used for human resource planning and other managerial decisions. Information from the Employee Profile can be used for the initial identification of candidates for staff requirements, promotional opportunities, or in re-assigning employees within the corporate structure. You are responsible for updating your Employee Profile on a continual basis. You'll receive an Employee Profile form from the Human Resources Department once a year for updating.







UNIVERSITY RELATIONS

BNR cultivates university relations through a series of programs which are intended to make education and research more complementary to the needs of the telecommunications industry, while increasing the strength and broadening the capabilities of the educational institutions.

The following areas outline the scope of BNR's university relations program.

6.1 JOINT RESEARCH PROGRAMS

These include specific exploratory work of interest to both BNR and various universities. In certain cases, BNR and a university enter into an agreement to do research at BNR locations and make the relevant work part of an advanced degree-granting program. For example, there are currently agreements between BNR and the University of Quebec (INRS), and between BNR and the University of Alberta.

6.2 VISITING PROFESSORS

University faculty on sabbatical leave work at BNR on research projects for short periods of time (usually for one year).

6.3 BNR STAFF TEACHING AT UNIVERSITIES

Outstanding BNR staff are encouraged to undertake teaching positions at universities for up to one full academic year, at BNR's expense.

6.4 POST-GRADUATE AWARD PROGRAM

Each year, a number of qualified BNR staff who apply for acceptance to a post-graduate program at various universities may receive assistance through the post-graduate award program. Details are available from your Human Resources manager.

6.5 SUMMER/CO-OP STUDENT PROGRAM

BNR hires selected students to work on various R&D projects during the summer or for work terms outlined in the curriculum of the co-op institution where they are studying.

6.6 EQUIPMENT DONATIONS

BNR donates surplus scientific equipment to various teaching institutions as part of an ongoing program to assist educational institutions. The donated equipment reduces demands on institutional budgets and helps provide the tools to support the training of professionals with a view to the future needs of the telecommunications industry.



CAREER PLANNING

Through career planning, you can become aware of your career opportunities, choices, and the consequences of these choices; and identify career-related goals. Career planning is a joint effort which involves you and BNR. BNR's responsibility is to provide the systems and programs you'll need to grow; the means for you to demonstrate your competence; and visible opportunities for career progression. But it is your responsibility to take

and guidance in the areas of job progression and career development. Through career counselling, you can also obtain help in identifying realistic goals and the steps you need to take in order to achieve your goals. The role of your manager is to provide direction, advice, or guidance based on a broad knowledge of the organization.

However, you must remember that your career is ultimately your own responsibility. It is important that you define goals, determine whether these goals are attainable, take time to evaluate the skills and knowledge required to achieve these goals, and set priorities.



advantage of this, to improve your present performance, and to acquire additional skills, knowledge, and experience for future career advancement.

7.1 CAREER COUNSELLING

Career counselling involves discussions between yourself and your manager or the local human resources representative, during which you can address a variety of career-related issues. You will receive practical advice

7.2 PERFORMANCE REVIEWS

Performance reviews enable you and your manager to assess, on a formal basis, your job performance, interests, capabilities, and position at BNR. They are also an opportunity to outline proposed future responsibilities and set goals which will form the basis for your next performance review.

An Early Performance Appraisal (EPA) is set with all regular full-time staff who are newly hired, have just been transferred from another unit or division, or have been newly promoted (see CP 2640.02). Further information is available from Human Resources or your manager.



TRAINING AND EDUCATION



Learning to use the appropriate BNR tools and processes is an important part of your new job in any project. Your manager will help you plan a set of courses and documentation to fill these learning needs as quickly as possible.

Along with mastering the skills and knowledge needed for your job, you will want to maintain currency in your professional field. Additionally, you will be expected to broaden your understanding of the telecommunications business, to include aspects of manufacturing, marketing, and user support that may relate to your work. Your career discussions with your manager should always include your specific plan of formal learning activities, to expand your knowledge base during the next time period.

The BNR Education Group helps managers analyze training needs, and develop appropriate sequences of training and documentation for people in their departments. Specialists in the Education Department at Carling and in the Learning Resource Centers also consult on the development of BNR courses and seminars, organize and evaluate programs given by tricorporate and external professionals, and manage training delivered by teleconference or electronic blackboard from other sites.

Some of BNR's internal training courses and seminars are developed and presented by our scientific staff, and produced on videotape in BNR's own television studio.

Other video courses are rented or purchased as needed. These are

available for viewing through the LRCs. In some cases, arrangements can be made to borrow cassettes for home viewing. For this purpose, BNR has standardized on VHS format.

To help you find out about and access BNR education programs of all kinds, a catalog is distributed twice yearly to all managers. Programs are organized under the following headings:

- Telecommunication
- Computer Training
- Design Processes and Tools
- BNR Product Development Training
- Manufacturing/Marketing
- Health and Safety
- Management Skills and Development

You may get more detailed information, and pass on new learning requirements, by talking to the education specialist in your region. We support the concept of life-long learning!

8.1 EXTERNAL EDUCATION

8.1.1 CORE PROGRAMS

Northern Telecom's Core Programs are available to BNR employees, and are similar in format and content to ours. Information is available from the training coordinator, Training and Education.

8.1.2 BELL CANADA TRAINING PROGRAMS

Bell Canada training programs, some of which are unique to Bell, are also available. Course information can be obtained from the training coordinator, Training and Education.

8.1.3 SEMINARS/CONFERENCES

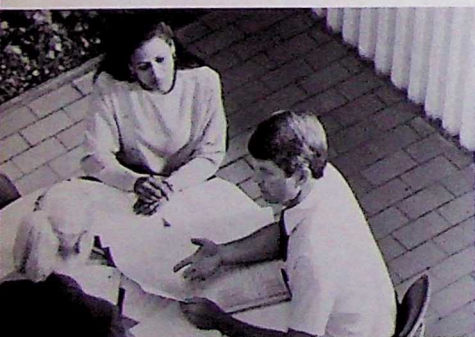
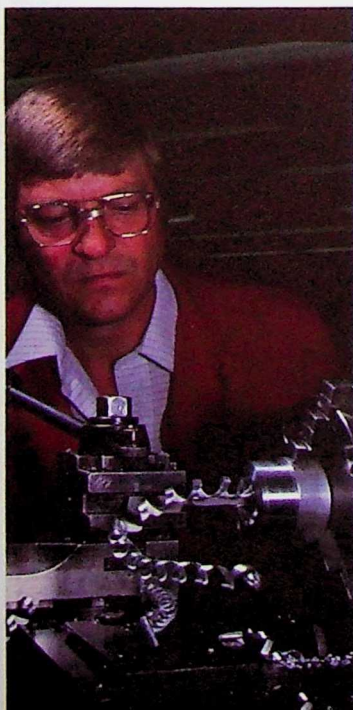
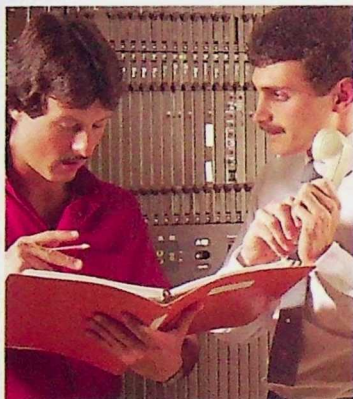
As part of your specific development plan, you may be asked to attend certain seminars and/or conferences.

Upon your return, you are expected to submit a brief report to your manager, highlighting new insights gained, the appropriateness of the material studied, and the overall quality of the seminar or conference.

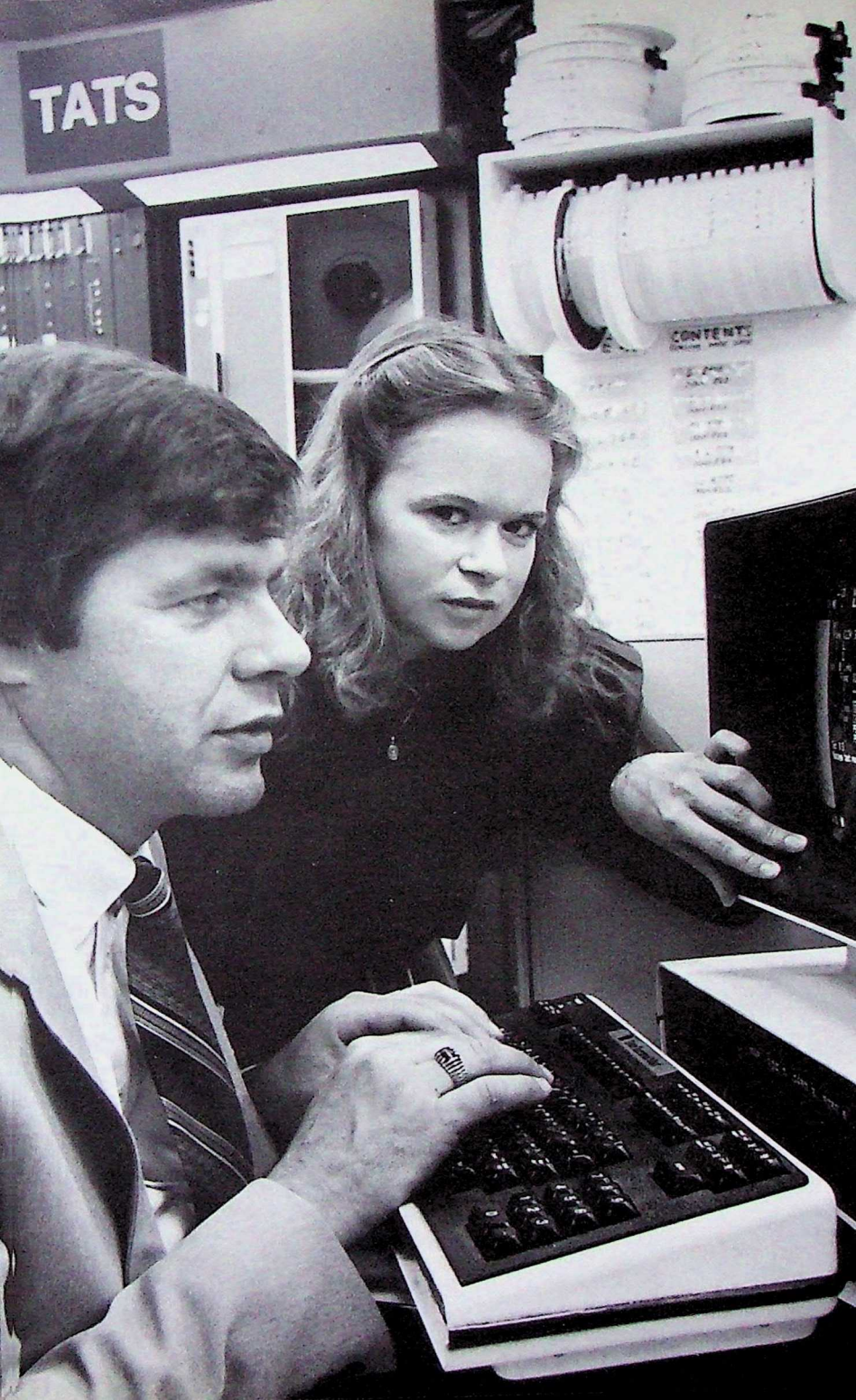
Occasionally, you may be asked to present a paper at a conference. Before accepting the invitation, make sure you review the request with your manager and the manager of Editorial Services, and receive the necessary approvals (see Conferences and Publications, Section 15.2.5).

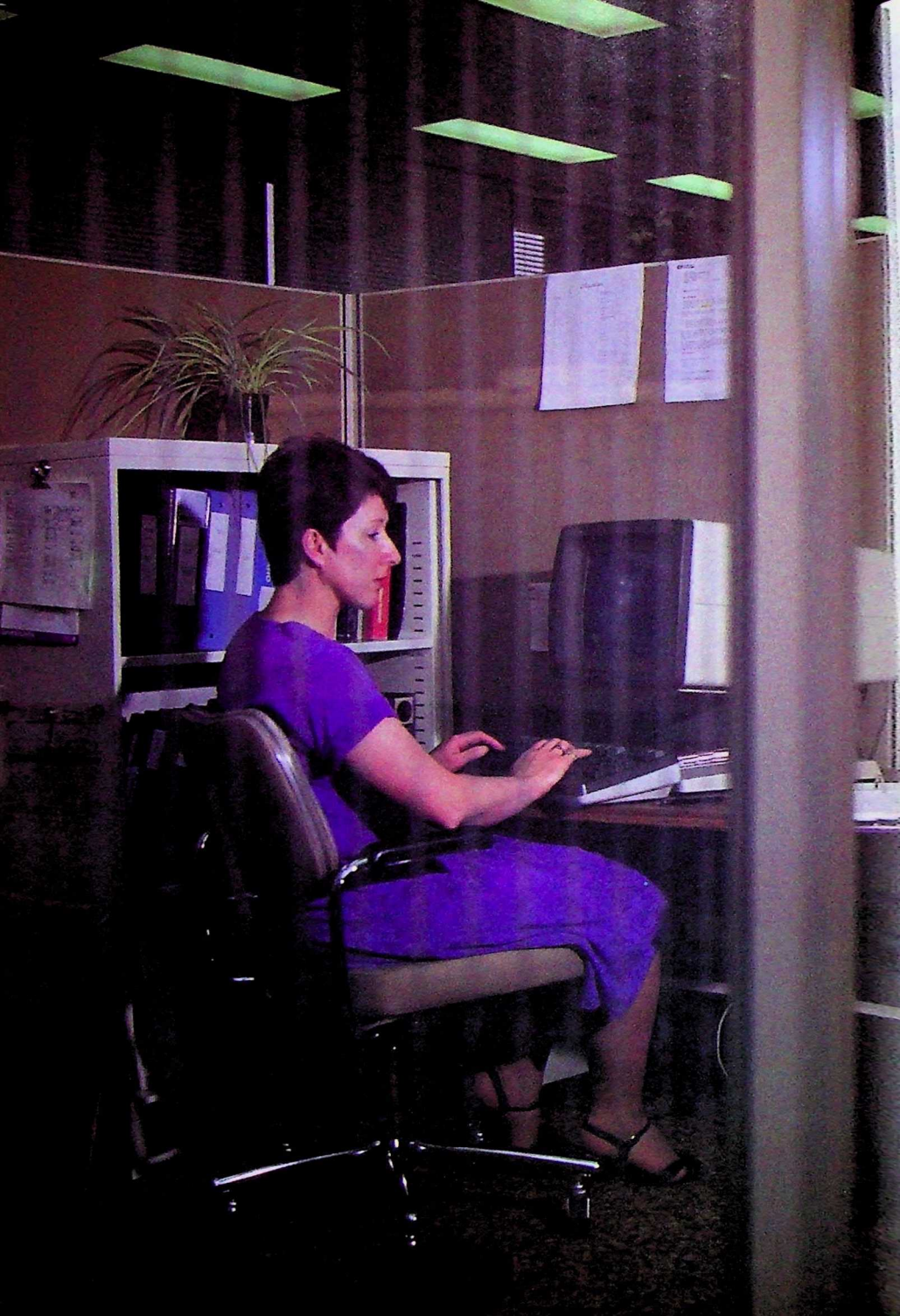
8.2 EDUCATION UPDATING/ TUITION REFUND

Technology changes rapidly. It is therefore essential that each of us maintain our professional standards and update our knowledge in our specific fields of interest. The tuition refund program covers tuition fees and books for approved courses taken in a recognized learning institution (see CP 2625.01).



TATS





SALARY ADMINISTRATION

It is BNR policy to pay employees competitive rates compared to similar positions in high technology companies.

The salary program stresses:

Internal equity: value of each job relative to other jobs within the organization.

External competition: BNR must be able to attract and retain highly qualified employees and therefore sets rates that are quite competitive.

Personal motivation to achieve goals: salary treatment serves to motivate employees to achieve high levels of contribution by recognizing and rewarding individual contribution.

Flexibility to change: salary program and classification are responsive to changes within the organization and within the competitive market, based on job content for both new and existing jobs.

considered for merit treatment on an annual basis.

Classification — Classifications are based on job content and are reviewed as changes occur. Your classification reflects your job's content and how it relates to other jobs in the company.

Overtime — Support staff employees are eligible for overtime pay for work of 1/2 hour or more performed outside of regular working hours. Any overtime must first be authorized by your manager. The rate will be time and a half for the first four hours of overtime, and double time for overtime hours in excess of four hours on a regular week day. The rate will be time and a half for the first 7.5 hours worked during the weekend and double time for hours in excess of 7.5 hours. If management specifies that overtime is to be worked on a Sunday or on a statutory holiday, double time will apply.

Premium Pay — If you are required to work offshift in a regular program, a differential will be paid for the hours worked outside of BNR's normal work hours. If your duties require you to remain on standby, a two hour premium per shift will be paid.

Should you get called in, an additional minimum premium of three hours will be paid at the appropriate overtime rate.

9.1 SALARY POLICY

9.1.1 SUPPORT STAFF

(ADMINISTRATIVE AND TECHNICAL)

Progression and Ranges — Employees in a new job are paid in the development zones and have the opportunity to progress to the job rate or mid-point. Progression increases are not automatic but are based on performance and growth.

Annual Review — Employees whose salaries are at mid-point or above are

9.1.2 TECHNICAL AND SCIENTIFIC STAFF AND PG2 TECHNICAL MANAGERS

Six Month Review — Concurrent with a review of performance after six months on the job (Early Performance Appraisal) the appropriateness of the salary level will be reviewed.

Annual Merit Review — Salaries in BNR are adjusted annually. Your personal salary will be based on your level of contribution compared to your peers.

Maturity Curves — MTSS, MSSs and Peer Group 2 technical managers are paid relative to maturity curves. These curves reflect BNR's assessment of a competitive salary in the external market. An individual's salary within the curves is based on his/her technical maturity and contribution relative to his/her peers.

Overtime — Technical and scientific employees and PG2 managers are eligible for overtime pay for mandatory work outside of regular working hours. Overtime worked either in the office or at home must be planned and authorized in advance by the responsible manager. The rate will be straight time for authorized overtime worked up to 7.5 hours in any bi-weekly period and time and one half for overtime worked in excess of 7.5 hours in any bi-weekly period. If management specifies that overtime is to be worked on a Sunday or a statutory holiday, time and a half will apply.



9.1.3 PROFESSIONAL AND MANAGEMENT STAFF (GRADE 3 - 13)

Six Month Review — Concurrent with a review of performance after six months (Early Performance Appraisal) the appropriateness of the salary level will be reviewed.

Annual Merit Review — Salaries in BNR are adjusted annually. Your personal salary will be based on your level of knowledge and performance on the job.

Salary Ranges — Administrative Assistants, Specialists, and Admin. Managers are paid relative to salary ranges for their job. Salary ranges are based on internal equity and external competition. Each individual's salary related to the range is based on the individual's knowledge and performance in that job.

Classification — Jobs are classified and graded according to their content and the relativity to other jobs in the company, and to the external job market. Jobs are evaluated using the BNR job evaluation plan which is administered by the Salary Administration Department in cooperation with line managers.

Overtime — Professional and management employees are eligible for overtime pay for mandatory work outside of regular working hours. Overtime worked either in the office or at home must be planned and authorized in advance by the responsible manager. The rate will be straight time for authorized overtime worked up to 7.5 hours in any bi-weekly period and time and one half for overtime worked in excess of 7.5 hours in any bi-weekly period. If management specifies that overtime is to be worked on a Sunday or on a statutory holiday, time and a half will apply.

Salary Ranges — Senior managers are paid relative to salary ranges for their job. Salary ranges are based on internal equity and external competition. Each individual's salary related to the range is based on the individual's knowledge and performance in that job.

Classification — Jobs are classified and graded according to their content and the relativity to other jobs in the company and the external job market. Jobs are evaluated using the BNR job evaluation plan which is administered by the Salary Administration Department in cooperation with line managers.



9.1.4 SENIOR MANAGERS (GRADE 14 AND ABOVE)

Six Month Review — Concurrent with a review of performance after six months (Early Performance Appraisal) the appropriateness of the salary level will be reviewed.

Annual Merit Review — Salaries in BNR are adjusted annually. Your personal salary will be determined based on your level of contribution compared to your peers.



BENEFITS

You and your immediate family are protected by a shared-cost benefit program to which you are entitled as a regular full-time employee. BNR pays the full cost of most benefits; you pay only a small amount for certain optional plans. The company also contributes substantial amounts on your behalf toward the government programs that provide general benefit coverage.

This program is reviewed regularly to keep it up to date. From time to time, you will receive bulletins outlining changes in the program, and once a year, a comprehensive statement of your personal coverage under all benefit plans. Your manager or the Human Resources Department can answer any questions you may have about your benefit coverage.

Here is a brief description of BNR's benefit program, outlining what benefits are provided, when you are eligible to participate, and who pays the cost. You will find full details in the booklet called **Your Benefits**, and in the appropriate sections of the Corporate Procedures.

10.1 HEALTH CARE

10.1.1. PROVINCIAL HEALTH INSURANCE

Provincial Health Insurance covers most basic health care expenses, including doctors' fees, surgical procedures, ward hospital accommodation, and emergency outpatient care. Your participation depends on prior enrolment and on your province of residence. BNR pays the full cost, where applicable.

10.1.2 SUPPLEMENTARY HOSPITAL BENEFITS

Supplementary Hospital Benefits pay the difference between ward and semi-private hospital accommodation. You are eligible from your first day of work, and BNR pays the full cost.

10.1.3 EXTENDED HEALTH CARE BENEFITS

Extended Health Care Benefits pay 100% of most medical expenses not covered under provincial health insurance, after the annual deductible, plus 50% of certain other health care expenses, with no deductible. You are eligible from your first day of work, and BNR pays the full cost.

10.1.4 DENTAL CARE BENEFITS

Dental Care Benefits cover 100% of basic dental expenses and 80% of periodontic and endodontic expenses, after the annual deductible, plus 50% of major restorative and orthodontic expenses, with no deductible.

You are eligible from your first day of work, and BNR pays the full cost.

10.2 DISABILITY

10.2.1 SICKNESS AND ACCIDENT BENEFITS

Sickness and Accident Benefits pay 70% or 100% of your salary for up to 52 weeks, based on your net credited service. You are eligible from your first day of work, and BNR pays the full cost.

10.2.2. LONG TERM DISABILITY BENEFITS

Long Term Disability Benefits ensure 70% of your basic salary if total disability extends beyond 52 weeks. You are eligible from your first day of work, and BNR pays the full cost.

10.2.3 CANADA/QUEBEC PENSION PLAN DISABILITY BENEFITS

Canada/Quebec Pension Plan Disability Benefits provide a monthly income in case of severe and/or prolonged disability. The amount is proportional to your salary and to the time you have spent in the workforce. You and BNR share the cost of the premiums.

10.2.4 WORKMEN'S COMPENSATION ACCIDENT AND DISABILITY BENEFITS

Workmen's Compensation Accident and Disability Benefits provide a monthly income in the event of a work-related disability. The amount is proportional to your earnings; BNR pays the full cost of the premiums.

10.2.5 UNEMPLOYMENT INSURANCE DISABILITY BENEFITS

Unemployment Insurance Disability Benefits give you a weekly income in case of sickness during the first three months of employment, or during maternity leave, provided that you qualify through U.I.C. contributions. You and BNR share the cost of the premiums.

10.3 SURVIVOR INCOME

10.3.1 GROUP LIFE INSURANCE — PART 1

Group Life Insurance — Part 1 provides coverage of your basic annual salary rounded to the nearest thousand dollars. You are eligible, upon enrolment, any time after the date on which you were hired. BNR pays the full cost.

10.3.2 GROUP LIFE INSURANCE — PART 2

Group Life Insurance — Part 2 coverage offers an additional 100% to 300% of your coverage in Part 1. You are eligible, upon enrolment, any time after the date on which you were hired; you pay the full cost of this option.

10.3.3 TRAVEL ACCIDENT INSURANCE

Travel Accident Insurance pays a minimum benefit of \$75,000 if you die in an accident while you are travelling on company business. You are eligible from your first day of work, and BNR pays the full cost.

10.3.4 SURVIVOR INCOME BENEFIT

Survivor Income Benefit provides your surviving spouse and dependent children with a continuing monthly income. You are eligible, upon enrolment, any time after the date on which you were hired. You and BNR share the cost.

10.3.5 CANADA/QUEBEC PENSION PLAN SURVIVOR INCOME

Canada/Quebec Pension Plan Survivor Income provides continuing monthly income to your surviving spouse and dependent children, plus a lump sum. You and BNR share the cost of the premiums.

10.3.6 WORKMEN'S COMPENSATION SURVIVOR INCOME

Workmen's Compensation Survivor Income gives your surviving spouse and dependent children a continuing monthly income plus a lump sum, if your death is work-related. BNR pays the full cost of the premium.

10.4 RETIREMENT

10.4.1 YOUR PENSION PLAN

Your Pension Plan coverage provides you with a lifetime monthly income, based on the pension formula, your years of continuous service, and the average earnings of your best consecutive three years. You are eligible after 10 years of continuous net credited service. BNR pays the full cost.

10.4.2 RETIREMENT TRANSITION BENEFIT

Your Retirement Transition Benefit provides additional monthly retirement income for up to 44 months. BNR pays the full cost.

10.4.3 EARLY RETIREMENT SUPPLEMENT

The Early Retirement Supplement gives you additional monthly retirement income payable from the date of your early retirement until you reach age 65. BNR pays the full cost.

10.4.4 VOLUNTARY SUPPLEMENTAL PENSION PLAN (VSPP)

A Voluntary Supplemental Pension Plan (VSPP) is available to augment your monthly retirement income. You are eligible, upon enrolment, after six months of service. This plan qualifies under the Income Tax Act with your contributions deductible for income tax purposes. BNR pays all administration costs.

10.4.5 CANADA/QUEBEC PENSION PLAN

The Canada/Quebec Pension Plan pays a monthly retirement income starting at age 65. You and BNR share the cost of the premiums.

10.4.6 OLD AGE SECURITY

Old Age Security provides monthly retirement income starting at age 65. All Canadian residents are eligible, provided they meet the necessary requirements. Old Age Security is funded from general tax revenues.

10.5 SAVINGS PLAN

All regular full-time employees who have completed at least six months of continuous service are eligible to join either the Employee Savings Plan (Bell Canada shares) or the Northern Telecom Investment Plan (Northern Telecom shares or guaranteed income certificates).

BNR contributes to both plans, which offer various income sheltering options. Further details are available from the Benefits Department (see CP 2312.01).

10.6 PAYROLL DEDUCTIONS AND BANK DEPOSITS

While certain deductions from your pay are obligatory under the law, you may authorize other deductions to suit your chosen and designated requirements. The classes of payroll deductions and designations available to you are outlined here.

10.6.1 STATUTORY DEDUCTIONS

The law requires that the following be deducted from your pay:

- federal income tax
- provincial income tax
- Canada/Quebec pension plans
- Unemployment Insurance
- garnishees (if any)

10.6.2 VOLUNTARY DEDUCTIONS

If you choose to, you can authorize that most or any of the following be deducted:

- credit union
- Canada Savings Bond
- individual life insurance (Sun Life, Mutual)
- United Way
- Telephone Pioneers
- Group Life Insurance Premiums - Part 2
- Survivor Benefit Insurance Premium
- Employee Savings Plan (Bell Canada)
- Northern Telecom Investment Plan
- Voluntary Supplemental Pension Plan (past and current service)
- deposits to designated banks (under \$1000. per pay)
- direct deposits of total net pay to any financial institution





LEAVE

"Time off" means short periods of discretionary paid or unpaid absences, mainly for personal reasons. "Leave", on the other hand, is part of your benefit package. You earn leave through your employment with BNR. The following are all classified as leave:

- 11.1 Holidays
- 11.2 Vacation
- 11.3 Maternity/Adoption
- 11.4 Sick Leave
- 11.5 Leave of Absence

11.1 HOLIDAYS

BNR provides 12 paid holidays each year, as follows:

- New Year's Day
- Good Friday
- Victoria Day
- St. Jean Baptiste Day (Quebec employees only)
- Canada Day
- Civic Holiday (Canadian employees working outside Quebec)
- Labor Day
- Thanksgiving Day
- Christmas Day
- Boxing Day
- Half a day on the last work day before Christmas and New Year's Day
- Two days of floating holiday, usually applied towards Christmas make-up time.

If one of the above days falls on a Saturday or Sunday, the work day that immediately precedes or follows is granted as holiday instead.

11.2 VACATION

Every employee, when entitled, must take a minimum of two weeks' vacation each year. The amount of leave you are entitled to each year is determined by your net credited service as of June 30, according to the following schedule:

LENGTH OF SERVICE	ANNUAL VACATION
• Less than one year	1 1/4 days for each full calendar month of service
• One year but less than 10 years	3 weeks
• 10 years but less than 19 years	4 weeks
• 19 years but less than 30 years	5 weeks
• 30 years or more	6 weeks

When your service date falls within the last six months of a calendar year, and you qualify for the fourth, fifth or sixth week of vacation, you are considered to have earned the extra week by June 30 of that year.

You must take your annual vacation between January 1 of a given year and April 30 of the following year. With the prior written approval of your vice-president, and further authorization of the Employees Benefit Committee, you may extend the leave period from April

30 to December 31. Under no circumstances may a given year's annual vacation be taken later than December 31 of the following year.

11.3 SICK LEAVE

Should you become sick or disabled, you are entitled to sick leave with pay, a benefit that protects your salary while you are unable to work owing to illness or accident.

This benefit comes into effect after the seventh consecutive day of absence because of the sickness or accident. The first seven days are classified as incidental absence and are fully covered by your department. On the eighth day, the plan will pay either 100% or 70% of your basic salary for up to 52 weeks, depending on your service, as outlined in the booklet **Your Benefits**.

If your disability continues beyond 52 weeks, the Long Term Disability Plan takes over, and pays 70% of your salary until you return to work or reach age 65, whichever comes first.

To claim these benefits you must follow these procedures:

- Notify your immediate manager during your first half-day of absence, and continue to advise as to your state of health and where you can be reached.
- If yours is a work-related accident or illness, your manager is responsible for notifying the Benefits Department within 24 hours and completing a BNR-70 form. The Workmen's Compensation Board, and in some cases other government departments, must also be notified.
- Obtain medical care from a qualified doctor. For disabilities lasting longer than five working

days, or for any occupational accident, make sure that your physician forwards a medical report promptly to the BNR Medical Department.

- If it appears that your disability will extend beyond 52 weeks, your Benefit Department will provide you with appropriate forms to be completed by you and your doctor well before your Short Term Benefits expire. This way, you can be sure that there is no break in your income protection.

11.4 LEAVE OF ABSENCE WITHOUT PAY

For various reasons, you may want or need a temporary absence from BNR, with the intention of returning after you have accomplished your goals. For certain purposes, a leave of absence without pay may be granted. This type of leave preserves your continuity of service in relationship to service dependent benefits, such as company pension and sickness disability payments, should you return to BNR after your leave expires.

BNR considers that a leave of absence is a privilege, and each request will be reviewed on its individual merit.

Requests are submitted through your manager, who must recommend your application before it is considered further.

Leaves of less than four weeks may be approved by your divisional vice-president. Beyond four weeks, the Employees Benefit Committee authorizes requests up to a maximum of 12 months.

The granting of a leave of absence does not imply a guarantee of re-employment, except in the case of the 17-week maternity/adoption leave, where guaranteed re-employment is a legal requirement.

The following types of leave of absence may be requested:

- 11.4.1 Personal Leave
- 11.4.2 Educational Leave
- 11.4.3 Maternity/Adoption Leave

11.4.1 PERSONAL LEAVE

If you need an extended period off work to resolve personal problems, to take a longer vacation, to restore health through rest, or to work for another company at BNR's request, you may apply for personal leave. If the requested period exceeds one month, the case must be presented, in broad outline, to the Employees Benefit Committee.

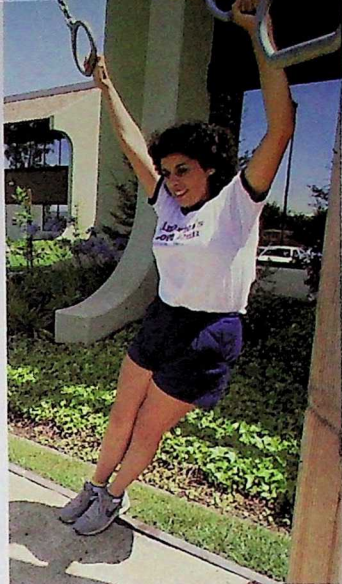
11.4.2 EDUCATIONAL LEAVE

If you wish to continue your education, and if your proposed studies will benefit your work at BNR, you may request educational leave. We expect you to return to BNR after you have finished your studies.

Educational leave is granted for up to 12 months. Should you need an extension beyond the initial 12 months, you may have it authorized by submitting a new application to the Employees Benefit Committee before the original leave expires.

11.4.3 MATERNITY/ADOPTION LEAVE

All requests for a maternity/adoption leave of absence must be submitted to the Employees Benefit Committee for consideration. Any female employee, including a part-time worker who has been continuously employed for at least 12 months and 11 weeks before the expected date of delivery or adoption, may request this leave.

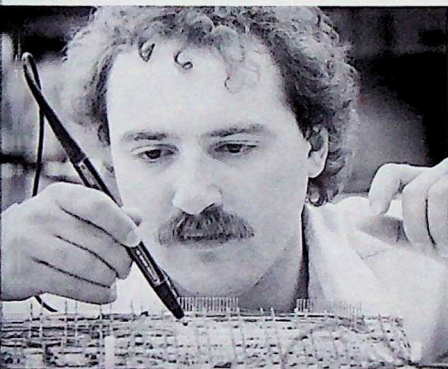




EMPLOYEE RECOGNITION

As an employee, you will find there are many opportunities to receive recognition for your contribution to BNR.

12.1 PROJECT RECOGNITION



The talents, efforts, and commitment of BNR's people to the successful completion of projects is the foundation for BNR's reputation for excellence. Line managers are encouraged to recognize individuals and teams for their contribution to BNR, and to celebrate the success of team achievements.

12.2 PATENTS

Patents are recognized annually at the Patent Awards dinner held in Ottawa. At the banquet, each patent recipient is presented with a framed patent certificate.



12.3 TELESIS AUTHORS

Telesis authors are also recognized at an annual event, which can vary from a banquet with a widely-acclaimed guest speaker to a dinner dance.

12.4 SERVICE RECOGNITION

Service recognition starts on your first day with BNR, when you receive a sterling silver pin bearing the company name and logo. On every five-year anniversary, you will receive a 14K gold service pin as a symbol of your BNR contribution.



HEALTH, SAFETY AND ENVIRONMENT

13.1 COMPANY AND EMPLOYEE RESPONSIBILITIES

Managers and employees must all contribute towards a healthy and safe workplace. While it is a joint responsibility, each party contributes in a different way.

BNR will take every reasonable precaution for your protection. As a manager, you must provide adequate information and instruction on workplace hazards so that all employees know how to minimize or eliminate them. If protective devices are required, a manager must ensure that they are provided, maintained, and used correctly. Managers must also involve employees in identifying and resolving health and safety issues in the workplace, either through health and safety committees, or through other types of participation.

Employees also have a necessary role to play. You must report workplace hazards to your manager, and use or wear the protective devices required. You must follow your manager's directions to minimize or eliminate hazards, and not operate any equipment or device in a way that endangers yourself or your colleagues. Litter such as untaped wires are a real hazard in the workplace, and can easily cause a fall. Please assure that litter is safely secured or out of harm's way. You are encouraged to voice your opinions, share your ideas, and participate in improving the health and safety of your workplace.

13.2 HEALTH, SAFETY AND ENVIRONMENT DEPARTMENT

This department provides information and technical services to all locations. It will assist in identifying hazards and recommending solutions. Its function is to design and implement industrial hygiene, occupational safety, and environmental protection programs.

13.3 HAZARD RECOGNITION AND CONTROL

There are four approaches to hazard control. The first is elimination of the hazard by, perhaps, redesigning the process. A second is the substitution of a less hazardous material, for instance using a different chemical. Then there are engineering controls, such as exhaust fans to draw away hazardous fumes. Finally, there is the use of personal protective equipment, like safety glasses.

To implement hazard control, discuss the situation with your manager, and then ask for assistance from the Health, Safety and Environment Department. If engineering controls are the appropriate solution, see the building manager or the Facilities Engineering Department.

To obtain personal protection equipment, you can order it or requisition it from the stockroom, or the safety glasses coordinator. To obtain safety footwear, see CP 1342.01.

13.3.1 HAZARDOUS MATERIALS

Knowledge of the dangerous properties of chemicals and proper handling procedures is fundamental to your safety. Familiarize yourself with chemicals in your work area by reading the Material Safety Data Sheets. For assistance, consult your manager or the BNR Health, Safety and Environment Department.

13.4 EMERGENCIES

While prevention is obviously the key, emergencies do arise. Familiarize yourself with the emergency procedures for your workplace. Know your nearest exit, and post the emergency numbers near your phone. Find out who the first aiders are in your area. Check with your manager for any special procedures. To report an emergency, telephone the emergency number or emergency coordinator. You'll find the numbers in the back of the company telephone book. Don't fight a fire unless you have been trained; your responsibility is to alert your colleagues, report the fire, and leave the area. Medical emergencies will be handled by first aiders or by the Medical Department, until further help arrives.

13.5 REPORTING OF INJURIES AND ACCIDENTS

All injuries that happen while you are at your usual workplace (including the grounds and parking lot), while visiting another location, or while traveling from one site to another, must be reported within 24 hours. Complete a BNR-70 form and send it to the Benefits Department in Ottawa, or your local Human Resources Department if you are in another lab. Remember to report all injuries, however minor — they could become serious later. Seek medical advice for all serious injuries. If you are a manager, you are responsible to

investigate, analyze, and take corrective action to prevent another accident.

13.6 HEALTH AND SAFETY COMMITTEES

Health and Safety Committees have been established at most BNR locations. Ask your colleagues whether your department is represented on one. If the answer is yes, find your representative and ask how you can help. If not, there may be a lab council or other group where health and safety issues are addressed.

13.7 MEDICAL SERVICES

The BNR Medical Department provides a broad range of medical services to employees, such as the treatment of minor illnesses and emergencies, the care of injuries sustained either on- or off-duty, allergy injections and immunizations, and examinations following a disability absence to ensure that you are well enough to return to work.

The department also offers a voluntary preventive health program to promote and maintain a high level of health and well-being. The program features an Initial Health Review and a Periodic Health Examination. To complement this program, you can get individual and group counselling services in such areas as stress management, physical fitness, nutrition, alcohol and drug abuse, and smoking cessation.

Your medical records are confidential to the BNR Medical Department. If you wish to have the results of examinations forwarded to your family physician, simply give the Medical Department a written authorization.

You may use the services of the Medical Department either by appointment, or by visiting the department during regular working hours. In Toronto or Montréal, contact the local Bell Canada Medical group, who provide similar services for BNR employees.

In Edmonton, contact the Human Resources representative.







SECURITY

The Information Security Handbook is your basic reference on security matters.

14.1 ACCESS TO BUILDINGS

If you are a regular full-time employee (RFT) an ID badge will be issued to you when you start work and will be renewed at regular intervals. This badge, which displays your photograph on a purple background, name, employee number, and expiry date, allows you to use the facilities freely at all times except areas designated "limited access". You will, however, be asked to sign in and out during off-peak hours, on weekends and holidays, regardless of identification. Your ID badge also enables you to sign in and escort visitors to BNR.

Always wear your badge while at work. Make sure it can be readily seen — attach to outerwear above the waistline, if possible.

Should you lose or forget your regular badge, present proper identification to security desk personnel, who will then provide you with a daily pass, which has a green background. This pass, also issued to Bell and Northern Telecom employees who only visit BNR facilities on occasion, entitles you to those privileges listed above; however, you will be asked to sign in and out at all times, and to relinquish your daily pass at the security desk when you leave the building.

Bell and Northern Telecom employees who normally work in offices on BNR premises wear a badge with a yellow background which bears the same information and carries the same privileges as those issued to BNR employees.

Three types of badges with a red background identify temporary employees, contractors, and visitors with limited access and privileges.

14.2 HANDLING COMPANY INFORMATION

At BNR, information is classified according to its usefulness to our competitors. In handling each class of information, be aware of the procedures and regulations specific to it.

Information falls into one of four classes: BNR PRIVATE, BNR RESTRICTED, BNR PROPRIETARY and PUBLIC DOMAIN.

BNR PRIVATE

BNR PRIVATE refers to proprietary information that is vital to BNR, Bell Canada, and/or Northern Telecom in doing business.

Information is classified PRIVATE when its disclosure could prevent us from achieving major objectives, result in substantial financial loss, be of significant benefit to competitors, or be detrimental to the reputation of BNR or its parent companies. For example, a document that contains the marketing plans for a new electronic office product from Northern Telecom would be classified BNR PRIVATE.

Classification at this level is assigned by a company officer, who also approves the distribution list, the control to be placed on reproduction, and the use of such documents off-premises.

When not in use, documents classified BNR PRIVATE must be stored in a record safe or in a steel filing cabinet equipped with locking bar and padlock.

The use of electronic mail to transmit BNR PRIVATE information is not allowed.

BNR RESTRICTED

BNR RESTRICTED information is proprietary information important to BNR or its parent companies in doing business. Information is RESTRICTED when its disclosure could result in the loss of valuable trade secrets or know-how, or when it might in some other way be detrimental to BNR or its parent companies' competitive advantage in the marketplace. Any formula, pattern, device, or compilation of information that is used in our business, and that gives us an advantage over competitors, may be considered RESTRICTED.

Classification at this level is assigned by a manager, who also approves the distribution list and any controls on reproduction or use of such documents off-premises.

When not in use, documents classified BNR RESTRICTED must be locked up in a desk drawer or filing cabinet. The use of electronic mail to transmit BNR RESTRICTED information is not allowed.

BNR PROPRIETARY

The classification BNR PROPRIETARY applies to material containing data that have inherent value, but is not classified as either PRIVATE or RESTRICTED. This information may be used internally or by BNR customers and suppliers. Training materials, statistical data, drawings, specifications, routine computer programs, and memos are typically PROPRIETARY information. The largest volume of sensitive company information bears this classification, which is assigned by the responsible manager. You must take regular security precautions when storing or transmitting these documents.

PUBLIC DOMAIN

Documents and material containing information that has been approved for release or publication by the Public Relations Department bears this classification. Remember that only information classified PUBLIC DOMAIN can be considered unclassified. Use regular office procedures in handling such documents.

14.3 INVENTION AND TRADE SECRET AGREEMENT

BNR regards inventions and industrial designs, technical information, and know-how conceived and developed by its employees in the performance of their work for BNR, as company property, and shall protect and exploit them appropriately, consistent with the corporate objectives and strategies of its parent companies.

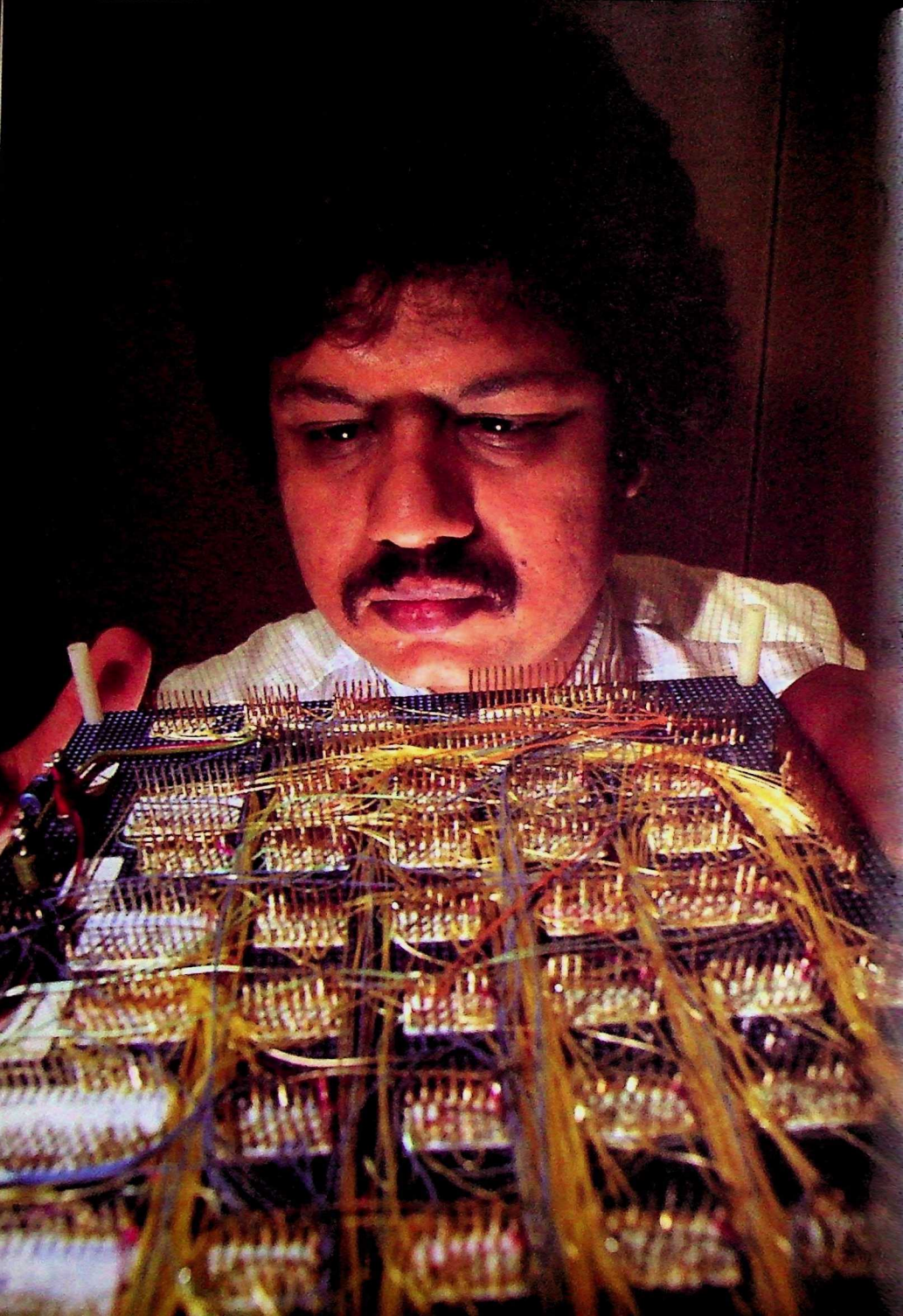
When you join BNR, you are asked to recognize this policy formally by signing an "Invention and Trade Secret Agreement". This agreement assigns

patent rights to BNR, limits the disclosure of information, and identifies BNR as the owner of all models, instructions, drawings, notes, memoranda, and other written communication originated or acquired by you while employed by BNR. You must also sign a "Certificate of Compliance" when you resign.

14.4 COMPUTER SECURITY

In order to use the BNR computer, you'll need a computer user identification number and a password. Complete a User-ID Request form (identify yourself, your storage requirements, and the account numbers against which your computing charges will be allocated). After proper authorization, you will be issued with your ID and supplied with an initial password. BNR requires that you change your password every 45 days, without repeating any of your past five sequential passwords in doing so.





COMMUNICATIONS

Because of the size and extent of BNR, and the range of our audiences, communications is a key factor in our success.

Generally speaking, BNR communicates with two prime audiences: internal and external.

In addition, we provide electronic/computer communications facilities and tools to support our people's needs to communicate. The following details some of the programs and media available at BNR.

15.1 INTERNAL COMMUNICATIONS

Internal Communications is a department within the Public Relations Group and an overall description for some of the programs, forums, and activities in place in the organization. Public Relations is identified as the source where applicable.

15.1.1 MEETINGS

Many of the meetings which take place in BNR are designed to facilitate the flow of information between employees and management. The following are some which take place on a regular basis.

- **THE STATE OF THE BUSINESS ADDRESS TO MANAGERS** takes place once a year. Usually delivered by the president of BNR, its intent is to establish the direction of BNR, based on the business objectives of Northern Telecom, Bell Canada, and BNR. The

address is followed by a series of information sessions between managers and BNR staff.

- **PRESIDENT'S MEETINGS** are chaired by the president of BNR. They are quarterly corporate information sessions attended by senior divisional managers. The agenda generally includes financial results, as well as trends vis-à-vis budgets and forecasts. These meetings are linked to the other labs from Ottawa via teleconferencing.
- **DEPARTMENTAL MEETINGS** are called as required; managers and departmental personnel discuss technical or company related issues.
- **DIVISIONAL MEETINGS** are called as required to discuss technical information or budget reviews, and milestone analysis. Divisional vice-presidents and senior staff and/or other division members normally attend.

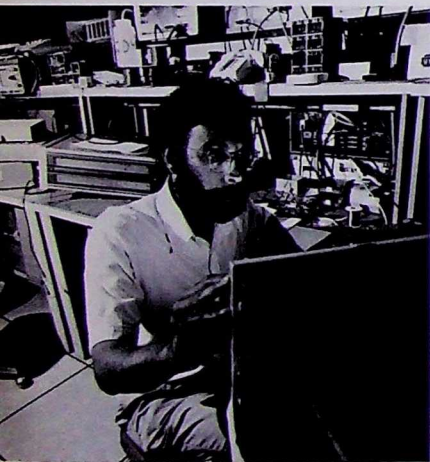
15.1.2 LAB COUNCILS

Councils play a consultative role at BNR and provide a valuable forum for communication, wherein common issues and opportunities are more easily identified and addressed. The

size, composition, and function of a council is determined on a divisional or lab basis. Job-related, career-related, and working environment topics form the primary focus of lab councils.

A Central Coordinating Committee (C.C.C.) exists to foster an exchange of information between the BNR executive and multiple lab councils at one site. When common issues need to be addressed by lab councils at other locations and BNR executive, the Employee Relations director coordinates the effort.

Lab councils need the commitment and support of the senior management in charge and participation by employees in order to provide a viable forum for communication. If you are interested in becoming involved in this process, contact your local human resources manager, who will provide you with the necessary information and contacts.



15.1.3 BULLETINS

Various types of bulletins deal with specific topics and are addressed to selected groups of readers. They are sent as the need arises.

15.1.4 NOTICE BOARDS

Employment opportunities, employee sponsored advertisements such as Items for Sale and Rides Wanted, notices of BNR/NT Club events, special event calendars, and similar information of general interest is posted on notice boards throughout the company. You may ask the mailroom to post your own advertisement or notice. Some locations also have news boards coordinated by Public Relations.

15.1.5 INSIGHT

BNR's monthly employee publication helps you keep in touch with what is happening in the company. It focuses on what BNR is doing as an organization, and also highlights the activities of BNR employees. You are welcome to submit stories and ideas to the editor, Public Relations.



15.1.6 WEEKLY NEWS SUMMARY

The Weekly News Summary is a digest of articles on the telecommunications and hi-tech industries which have appeared in major newspapers and trade publications. It also summarizes announcements, speeches, news releases, and bulletins that may be of interest to BNR employees. Copies of the newsletter are distributed to BNR managers each week. Order copies or reprints of the summarized articles by calling Public Relations.

15.1.7 COMPANY POLICIES AND PROCEDURES

BNR's official business practices are documented in a series of BNR policies and procedures. Separate sections deal with issues in the areas of Administration, Human Resources, Finance, Technology, and Security. If you need to reference information of this type, your manager or director has a complete set.

15.2 EXTERNAL COMMUNICATIONS

Public Relations meets the needs of BNR's outside audiences through the External Communications Department. These audiences include news media, opinion leaders, universities, and the community at large. Brochures, handouts, news releases, feature newspaper and magazine articles, and print advertising are all put to good use. The department also coordinates public relations activities which make use of displays, audio-visuals, conferences, tours and visits, as well as community relations.

15.2.1 PROMOTIONS

In addition to managing the tour and visit functions, this department organizes displays and exhibits, and assists with special internal events such as the BNR family picnic.

The Promotions Department also produces corporate audio-visuals and will assist BNR employees with their A/V needs. The department manages the corporate slide bank, and can lend you a varied and diverse selection of photographic material.

15.2.2 TOURS AND VISITS

Visits to BNR facilities now play a significant role in the marketing efforts of both Bell Canada and Northern Telecom. More than half of the groups visiting our facilities are either customers or potential customers. Courtesy tours are also conducted for groups which represent future business opportunities for either Bell or NT. Northern Telecom is the most frequent originator of sales visits.

Every BNR employee is responsible for helping to make a positive impression on our visitors. Your personal public relations efforts will help the visit program serve its purposes of enhancing the BNR profile and supporting the sales efforts of NT and BNR.

15.2.3 MEDIA RELATIONS

The news media, including newspapers, magazines, radio, and television, are the principal channels through which information is communicated to BNR external audiences.

Media Relations provides the media with newsworthy editorial and photographic material, and assists in researching story ideas both for the popular media and for trade publications. In addition, the department writes feature newspaper and magazine articles, conducts tours for journalists to familiarize them with our technology, and arranges interviews with BNR personnel.

This department also acts as a bridge between the media and all BNR employees. Should you be contacted directly by media people seeking information, refer them to Media Relations personnel before answering any questions or disclosing information.

15.2.4 TELESIS

Published by BNR, *Telesis** is a quarterly technical magazine produced by Editorial Services that conveys BNR's technical progress to an international audience in telecommunications, the scientific community, and other interested sectors of the business, industry, and government communities. *Telesis* can also be used as a valuable technical reference.

You receive the quarterly issues at home. Your views and ideas are always welcomed by the editor.

*Trademark of Bell-Northern Research

15.2.5 CONFERENCES AND PUBLICATIONS

Presenting a technical paper at a conference? The Conference and Publications Department will provide assistance in the areas of planning and approval mechanisms required to ensure that BNR is not releasing classified or vital information that could damage Northern Telecom's competitiveness in the telecommunications industry. They'll also show you how to transform a written report into an interesting, audience-pleasing speech.

15.3 ELECTRONIC/COMPUTER COMMUNICATIONS

You can reach and communicate with all Canadian and U.S. BNR labs and Northern Telecom locations through an electronic switched network (ESN) and through dedicated data links interconnecting various computer facilities.

15.3.1 ELECTRONIC SWITCHED NETWORK (ESN)

You can access the ESN from any BNR location. This network provides cost-effective voice communication between users, without going through the regular long distance service.

BNR pays the annual network costs in order to utilize the facility. So it's important to take advantage of this service.

To reach the ESN network and the appropriate location, use the access codes and the series of location codes which you'll find in the BNR telephone directory. When you call "off-network", use the area codes or the local calling area codes as required.

15.3.2 DATA LINKS

The various BNR and Northern computers are linked through dedicated, high quality data lines. This allows you to transmit information easily and quickly. Because various software packages come into play when information processing takes place between locations, there are several documents available through the online INFORM system which provide the more technically oriented user with specific information on available equipment, available software, types of data links, and locations of computers. Identical documentation is available on all mainframe computers, giving remote users the same privileges as local users.

15.3.3 TELECONFERENCING

There are corporate conference rooms located throughout BNR. These are furnished with a wide variety of audio-visual equipment and are available to any BNR employee. All corporate conference rooms are equipped to handle teleconferencing, with high quality audio links to all BNR locations.

There are two kinds of teleconferencing service available.

- **REGULAR SWITCHED NETWORK:** standard Conference 2000 telephones for two-point conferences to almost any telephone on earth; up to six people can use the Conference 2000 at any given time.
- **4-WIRE TELECONFERENCING SYSTEM:** high quality audio teleconferencing between all BNR locations and involving large groups of people.

15.3.4 FACSIMILE

Facsimile machines are located in all BNR mailrooms. The facsimile allows you to transmit an exact copy of a document anywhere within the company, or the tricorporate.

15.3.5 TWX AND TELEX

TWX and TELEX machines are located in most BNR mailrooms and are used to transmit text material only.

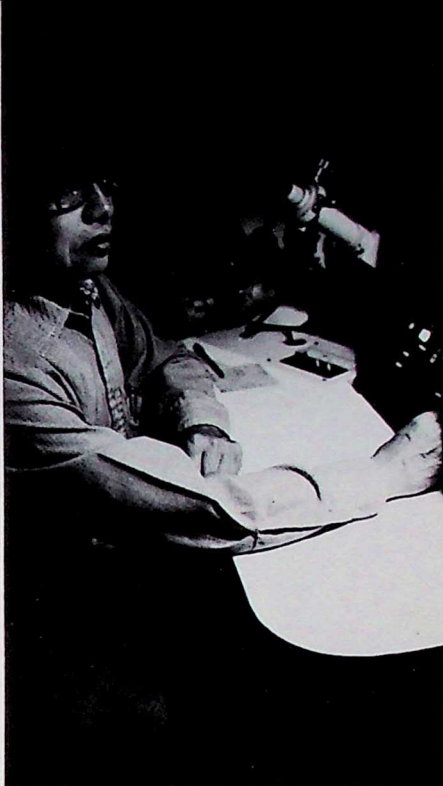
TWX machines are used to send text messages to all corporate locations as well as to any other Canadian or U.S. company with comparable equipment.

TELEX machines send text messages to any location with a teleprinter connected to the public telecommunication network (national and international).

To send a TWX or TELEX message, contact your local mailroom for assistance. You'll need to provide a copy of the message as well as destination address. Mailroom staff will then enter your message and send you a copy.

15.3.6 COMMUNICATING WORD PROCESSING

Some word processing units can communicate with each other and forward typed material through dedicated data links.



15.3.7 COCOS

COCOS (the Corporate Communications System) is a BNR-developed electronic mail system that operates using IBM mainframe computers. Using COCOS, you can prepare memos, messages, reports, or general documents, transmit the material to appropriate colleagues, and receive an answer quickly.

With COCOS, you can communicate with any BNR employee, and some Bell Canada and Northern Telecom employees, through a remote networking system.

You don't have to be a registered COCOS user to receive COCOS mail. However, if you wish to send mail, you must have a computer user ID which is known to COCOS. To become a registered user, call Computer Services.





DESIGN SUPPORT

Successful design combines creative ideas with superior execution. Rarely are all the skills required for complete design found within a single individual or group and therefore several specialized groups have been established at BNR to provide the necessary expertise. Staff members providing these services have considerable experience in their respective specialties and can make valuable contributions to all phases of a project, including the conceptual.

Often the best results are achieved by assembling, for the duration of the project, a single multidisciplinary team drawn from the groups listed here. In that way, project objectives are kept in focus and become the objectives of every member of the team. Clearly, this arrangement must be carefully managed and is usually practical only for larger projects.

The expertise of the major groups is described in the following section. To contact a group, refer to the Directory of Services in the BNR phone book. For groups not listed there, consult your manager. Several groups exist under specific project umbrellas, yet provide services to others in the company. In all cases, before requesting work from a group, check with your manager to ensure coverage of funding and scheduling issues.

16.1 *HARDWARE PRODUCT DESIGN*

16.1.1 *CBDS - CIRCUIT BOARD DESIGN SYSTEM*

CBDS is a software system running on BNR mainframes, which is used to capture circuit board electronic design information. Files generated are used to drive PCB layout, ordering, and manufacturing operations. Each development organization (division) is responsible for providing terminals and securing computer time for the CBDS service. Schematic input is usually done by designers or technologists using a program called LOKI; PCB layout, depending on complexity, is performed by technologists or layout staff assigned to the project. The *CBDS Hotline* provides training information and help. Address requests for CBDS terminals to your divisional CBDS coordinator, via your manager.

16.1.2 *COMPONENTS*

Component selection can seriously impact the downstream cost, yield, and performance of a design. The competitive advantage gained by using the latest component must always be weighed against yield, testability, and cost of stocking another code (which includes vendor qualification, ordering, incoming inspection, shelf space, and burn-in). Since the trade-offs are volume-sensitive, it is important to recognize that most of our designs

have low lifetime volumes, i.e. less than 1000 units. If the design justifies a new code, call *Components* for assistance in qualifying the part.

16.1.3 ELECTRO-MAGNETIC INTERFERENCE (EMI) STANDARDS

Stringent regulations in all markets governing radiated and conducted EMI require that effective control be designed into a product and not around it. In addition, our products must operate reliably in increasingly polluted EMI environments. A design approach that minimizes the generation of EMI usually produces better results than one which merely suppresses unwanted signals. For more information on design techniques, and to arrange testing in the free-field chamber at Corkstown (Ottawa), call the *Electromagnetic Engineering Department*.

16.1.4 MANUFACTURABILITY ASSESSMENT

To remain competitive, we must ensure that the designs we produce at BNR are immediately manufacturable by NT. The Product Support and Introduction Group (PS&I) provides this service, as well as many of the others listed in this section. The development groups are held responsible for overall product success. PS&I can help the designer by conducting design reviews at the various stages in the project to check for manufacturing layout, component lists, artwork, mechanical drawings, and other outputs. This function is similar to that of Product Integrity, except that it emphasizes the manufacturer rather than the customer.

16.1.5 MECHANICAL DESIGN

Although architecture and software determine the usefulness of a product, mechanical design plays a key role in creating a favorable first impression (and one that will last) and in determining the long-term operability. Two Mechanical Design groups, in Ann Arbor and Ottawa, are dedicated for Switching and Terminals respectively, and a third handles a broad range of transmission, outside plant, and computer products. These groups work in conjunction with Design Interpretive and the product developers to ensure that the human, as well as mechanical, requirements are met. Graftek CAD systems are used extensively for efficient design transfers to an increasingly automated manufacturing process. Because the mechanical design can offer many competitive advantages, as well as manufacturing risks, the mechanical groups should be involved in a product design from the conceptual stage. Establish contact through your manager.

16.1.6 MODEL SHOPS

Shops equipped for wood, plastic, metal, and printed circuit board fabrication provide a range of services, from simple one-off assemblies to complete working prototype models. Call to discuss specific projects and the degree of documentation required.

16.1.7 POWER

Power supply design is both complex and crucial to the success of any project. The Power Group maintains expertise in state-of-the-art techniques, and aims to cost-effectively satisfy the broad range of BNR product requirements from a minimum set of common building blocks. Because power supplies impact the cost and reliability as well as the mechanical and thermal designs of a subsystem, power requirements must be estimated early in the design process. Then contact the *Power Group* to produce a power module which forms an integral part of the overall design.

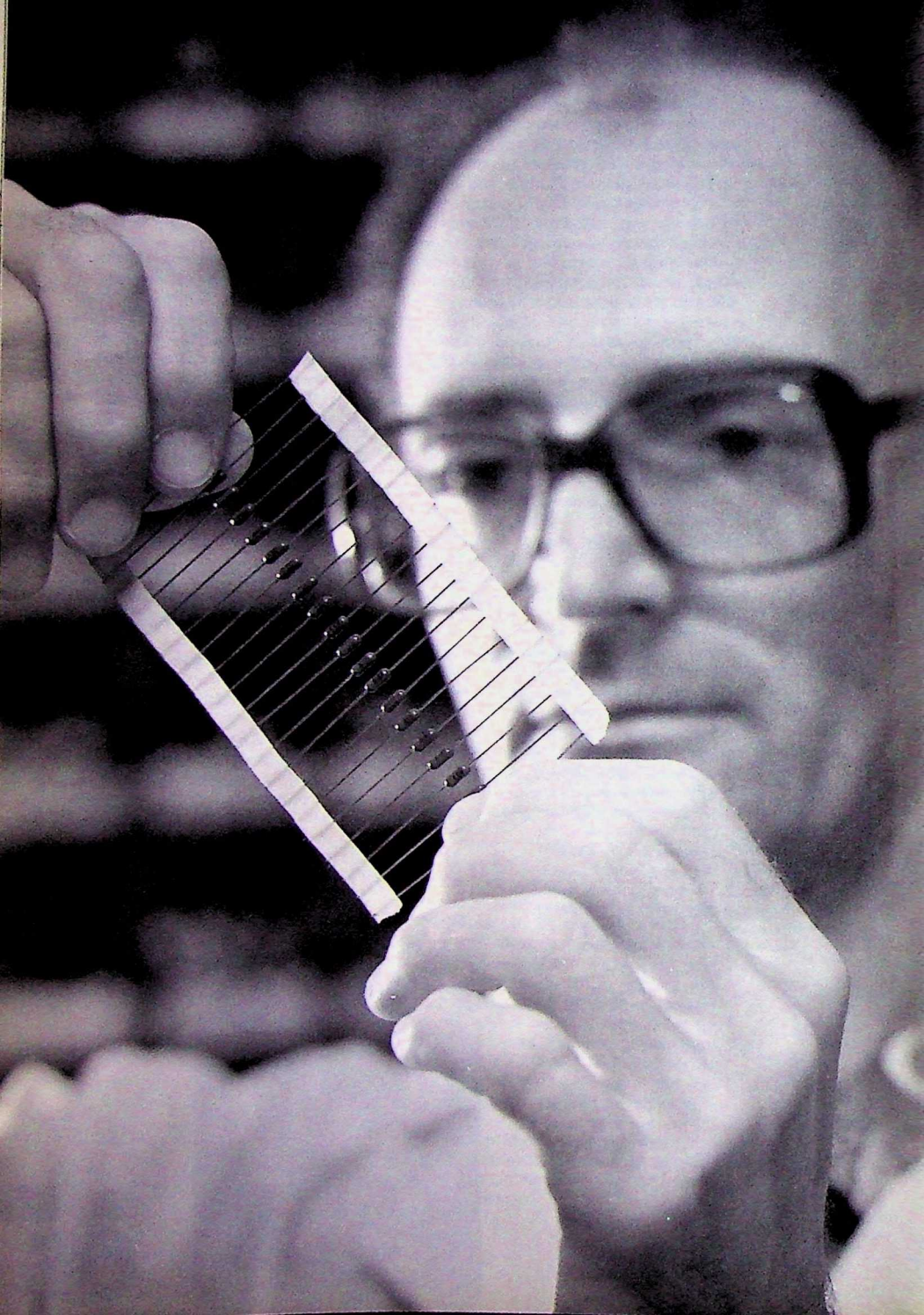
16.1.8 PRODUCT INTEGRITY

The Product Integrity Group acts as our owners' conscience in ensuring that the designs we deliver will indeed operate safely and reliably. They cooperate with NT Quality groups to track field performance and feed the results back into the design organization. Like NT Quality, Product Integrity operates somewhat autonomously in order to provide an audit which is visible to customers and, where required, to regulators. Costly downstream problems can be avoided by including *Product Integrity* personnel in the design process early enough to assess tolerance, timing, component selection, layout, safety, and other factors. Involvement should be both informal, during the design process, and formal, at design reviews.

16.1.9 SILICON-SUDS

We utilize full-custom or semi-custom silicon in our products to gain competitive advantage and life-cycle economies. The decision to use in-house silicon depends on many factors, only one of which is the higher up-front design costs and intervals. The advantages over a product life are volume- and market-dependent, and can be considerable. Many applications justify the use of in-house semi-custom gate arrays, designed by product developers themselves using the Silicon User Design System (SUDS). Call the *Component Development* group for assistance in making the trade-offs and for initiating silicon design.





16.2 SOFTWARE PRODUCT DESIGN

Increasingly, the key to success of products in all fields of telecommunications is the responsive development of application software. The leverage in the software production process lies in the design and commissioning phases, rather than in the manufacturing or replication phase. Formal design processes are therefore necessary to ensure correctness of design and product longevity through timely, controlled release updates.

The software process for each product line is managed within the respective development organization. The software development vehicles differ from product to product for historical reasons, and range from small-scale, commercially available microprocessor systems to fully-customized, high-volume systems for major product lines such as DMS.

These systems support one or more languages, provide compilation and library services, support generation of test cases, and include captive office facilities for testing.

The key to product quality, especially in larger systems, is control of the process to ensure that releases are of manageable size and that they are issued within intervals short enough to provide meaningful feedback to designers. Planners of proposed smaller systems should consult personnel experienced in the larger systems such as DMS-100, SL-1, or SL-10 for advice in deciding how software should be managed and released. Often, programs that begin as small assembler modules evolve quickly to multi-featured packages requiring careful management to ensure competitively acceptable results.

16.2.1 COMPUTING TECHNOLOGY: XMS SYSTEM

XMS uses state-of-the-art hardware and software technology with features designed to facilitate communications and ensure reliable operation. XMS systems operate either stand-alone or in distributed mode over copper or fiber local-area networks. Products developed on the XMS base can therefore offer end-user features with a competitive edge over those of vendors using standard commercial systems, without incurring the cost of the base system.

Distributed computing systems built from XMS workstations are used extensively within BNR as development vehicles for both large and small projects. The Software Development Environment (SDE) provided with the workstations supports compiler, library, editing, vintage, and access control functions.

The Computer Services Group provides workstations, SDE software, and support for development



applications. Contact the *Computing Technology* group for advice on using XMS technology in products, and for information on procurement of equipment for prototypes.



INFORMATION RESOURCE CENTER

17.1 DESCRIPTION

The Information Resource Center (IRC) at BNR is one of the largest and most progressive private information facilities in North America. We have a collection of over 30,000 volumes, 800 unique titles, and many educational resources. Through the IRC and its branches, we provide information services to all BNR employees.

The resources include reference books, technical, business and trade journals, marketing and regulatory reports, standards, BNR proprietary documents, and video-taped course material. In addition, the specialist staff of the IRC have access to online database systems containing information on a wide variety of subjects.



17.2 SERVICES

The IRC is equipped to answer your questions on topics of concern to you in your work. The specialist staff can give you technical information as well as information on markets, management, standards, and regulatory matters. If you work in a location other than Ottawa, you have access to online systems through a voice/data shared screen conferencing system developed by the IRC.

Video rooms are available at most locations; here you can view course material covering a wide variety of topics.

A current awareness service will alert you to the latest information contained in recent books, journals, and special reports. Electronic and printed bulletins are issued to keep you up-to-date on product announcements, marketplace competition, and legislation affecting our industry. The IRC will provide photocopies of selected material at your request.

Material is also available through inter-library loan. If an item you need is not already in one of our corporate collections, the IRC can obtain it from other information centers around the world.

Orientation sessions provide you with an outline of the services and resources available, and how they can be tailored to your needs.



COMPUTING AND COMMUNICATIONS SYSTEMS

The Information Systems (IS) Group provides computer, communication, and business systems and services to the BNR community. In general, the IS Group exists to plan and provide you with productive computer and communication tools, to train and educate you in their use, and to maintain and operate current computing and communication services. The group also introduces prototypes and products developed at BNR into a service environment, and provides feedback to the designers. Here are the facilities and services offered by the IS Group.

18.1 COMPUTING AND COMMUNICATION SYSTEMS

Computing and Communications Systems operates several mainframe computers at various sites.

The department is also responsible for the hardware, software, and language support for these systems, and for planning to ensure that adequate computer time is available to R&D groups. As well, the department evaluates new hardware designed at BNR in an active, service-like environment.

The Communications Group is responsible for the planning, installation, and maintenance of voice/data communication services, which utilize Northern Telecom's electronic switched network, to interconnect all NT and BNR locations in North America.

18.2 CUSTOMER SERVICES

The Customer Services organization communicates with over 4,000 computer users at BNR and provides a computer directory service which continually updates user IDs. It also coordinates a computer library, to maintain and update manuals; and computer documentation, to produce various hard and soft copy online newsletters about computing. User Services staff are available to help you with specialized computer problems, and a training and education department provides online, video, and classroom instructions.

The introduction of new services, technical investigation, consultation with end users, and software evaluation help to ensure satisfactory service integration. Data base services, dealing with data base applications and data base tool development, and service planning (such as business graphics applications) are also provided.

18.3 BUSINESS SYSTEMS

This department develops, supports, and operates the initial administrative, financial, and management systems of BNR. Financial systems development, data administration, and office systems are key areas of emphasis.



FREQUENT BUSINESS TRANSACTIONS

A number of departments provide specialized office and business skills and services. This section summarizes the services you are likely to access and the business transactions you are likely to encounter, rather than department activities. The list is not necessarily complete, but gives an introduction to basic services and transactions. These are in alphabetical order for easy reference.

19.1 ABSENCE

If you are unexpectedly absent owing to illness, bereavement, or the like, you must advise your immediate supervisor sometime during the first half-day of absence. Your manager will outline to you your benefit entitlements. If you are absent owing to illness, you must keep your manager advised as to your state of health and where you can be reached. Should you be ill for more than five working days, your manager will send you a "Sickness Disability Report" and a "Physician's Report" form which your doctor must complete. You should visit the Medical Department upon your return to work, to ensure you are fully recovered. See Section 11, Leave.

19.2 AUTHORIZATIONS

Every BNR business transaction that uses resources (for example labor, capital, or materials) requires proper authorization. This is simply good business practice. BNR's requirements are outlined in CP 3203.01 (Final Authorizations) which identifies the

various transactions as well as authorization requirements for each. Our authorization levels range from one (1) (President) to seven (7) (first level manager), and are listed in CP 3204.01 (Index of Signing Authorities).

Whenever you issue a document or request a service which requires an authorization, refer to the appropriate corporate procedure (CP) for guidance.

19.3 AUTOMOBILE USE

You may use your vehicle on company business and be reimbursed for expenses if you obtain authorization in advance by completing the "Authorization for the Use of Employee-owned Automobile on Company Business" form BNR-122. Details of the terms and conditions are described in CP 3225.01. Expenses are claimed on the "Employee Expense Voucher" (BNR-94).

19.4 BUILDING OPERATIONS AND MAINTENANCE

The physical plant and grounds, and all related services, are the responsibility of Building Operations and Maintenance. Professionals and skilled tradespeople on staff provide services that range from engineering to plumbing, electrical work, stationary engineering, heating, and air conditioning maintenance. Building Operations and Maintenance maintains the environment in which BNR carries out its business.

Ask Building Operations and Maintenance staff to move office or lab furniture and equipment, and install, adjust, or modify items related to buildings and facilities such as air conditioning or electrical outlets. You'll find their telephone number listed in the BNR phone book under the section entitled "Directory of Services". If the cost of the service is to be charged to your department, a "Work Order" form BNR-104 must be issued and properly authorized.

19.5 CAPITAL ASSET TRANSFER/DISPOSAL

The transfer and/or disposal of a capital asset is documented on a "Transfer and Disposal of Assets" form BNR-11 (see CP 3105.01).

19.6 CASH ADVANCE

If you must draw a cash advance (to travel, for instance), you must complete a "Requisition and Receipt for Cash" form BNR-70. The funds you spend are authorized on the "Employee Expense Voucher" form BNR-94. You may cash personal cheques once a week up to the established limit.

19.7 CLERICAL SUPPORT

The Clerical Support Department can provide you with temporary clerical and secretarial staff for short-term assignments. All staff are trained to follow BNR methods and procedures; some are trained to use BNR computer systems (including COCOS, our electronic mail system).

If you need temporary clerical help to carry out your department's business, address your request, by phone or in writing, to the Clerical Support Group, preferably with one week of notice. Costs will be charged back to your department.

19.8 COMPUTER USER ID REQUEST

Direct your User-ID request to the Customer Service Department of the ICS Group by completing the "User-ID Request" form.

19.9 CONFERENCE ROOMS

You may book any corporate conference room through the Conference Reservation Service (see also Section 15.3.3, Teleconferencing).

19.10 COPIER SERVICE

There is a photocopier at all locations for your convenience. The capabilities and features of the machines vary to suit a given area's user needs. Should equipment break down, call the mailroom; staff there will arrange for repair service.

Print up to 10 copies on a local copier. If you need more copies, take the job to the Reproduction Department (see Section 19.24).

19.11 CORPORATE PROCEDURES (CP)

All BNR policies and operating procedures are carefully outlined in the corporate procedures. You will find a complete set of CPs in your manager's or director's portfolio.

19.12 EDUCATION

You may sign up for management, skill improvement, or scientific courses by completing the "Educational Updating Request" form BNR-108; you may also request a refund of your tuition for courses which qualify under this program by completing the "Application for Tuition Refund" form BNR-31. In both cases, you will need your manager's prior approval, as outlined in CP 2631.01 and CP 2625.01, respectively. For more information, see Section 8.0, Training and Development.

19.13 EMERGENCIES

There are emergency coordinators at all BNR locations. They are listed at the back of your telephone directory, in the section entitled "Directory of Services."

19.14 EXPENSE VOUCHERS

Cash advances for future accountable expenditures may be drawn from the cashier by completing the "Requisition and Receipt for Cash" form BNR-70. Details of the expenditures must be outlined and authorized using the "Employees Expense Report" form BNR-94 (see CP 3224.01). The BNR-70 form may also be used to claim reimbursement for out-of-pocket expenses incurred on BNR business.

19.15 FINANCIAL INFORMATION SYSTEM (FIS)

BNR's Financial Information System is highly computerized, interconnecting all the relevant planning and budgeting modules with the data collection and reporting modules. The most visible product of this system is the monthly "FIS REPORT", where year-to-date actuals are matched against budget and forecast figures. These reports are sent to responsibility center managers and divisional controllers, for their information and analysis of variance and forecasting trends.

19.16 GRAPHICS AND ILLUSTRATING

The Graphics and Illustrating Group is responsible for the concepts, formats, planning, and production of most BNR publications (for example brochures, reports, manuals, documents, stationery, and forms). They also produce visual aids such as slides, vugraphs, displays, and posters.

Use a "Work Order" form BNR 104 to request graphic design and/or illustration work from this department.

19.17 MAIL

The mail service is provided to meet your local, intercompany and world-wide mail delivery needs. In general, the size of item you may send through the mail is limited by the size of standard BNR envelopes and by the mailperson's ability to handle it on a mail carrier. Items exceeding the standard BNR envelope size must be routed through shipping and receiving. There are special procedures for routing sensitive information — please consult your Information Security Handbook.

19.17.1 INTERDEPARTMENTAL MAIL

Internal mail will reach its destination within 24 hours of the time of sending. Interbuilding or intercity mail should arrive the following day. Intercity mail is shipped daily to most BNR locations by courier.

19.17.2 INTER-COMPANY MAIL (BELL AND NT)

Inter-company mail is shipped once a day by courier to most locations. Usually, this is an overnight service, although inter-country deliveries may take two days. In Ontario and Quebec, you may send your personal phone bill and health benefit claims through the inter-company mail free of charge.

19.17.3 EXTERNAL MAIL

All other mail is sent through the external mail system. There are two mail pick-ups and one delivery to and from the post office each day.

To accelerate the flow of mail from the U.S. to Canada, you may ask your business contacts in the U.S. to address their BNR correspondence to our U.S. post office box:

BNR
P.O. Box 402
Ogdensburg, New York 13669

We pick up mail from that box twice a week.

Please note that items other than those classified as "correspondence" or "company documents" require customs clearance and may not be sent through this channel.



19.18 OVERTIME

In most cases, you will be compensated for authorized overtime in excess of the regular 37 1/2 hour work week, as outlined in CP 2429.01. Overtime is authorized by your manager using the "Bi-weekly Overtime and Special Absence Report" form BNR-326. See also Section 9.1, Salary Policy.

19.19 PACKAGE PASSES

Package passes are a means of controlling the movement of merchandise and asset items that are hand carried

off the premises or between premises. The following corporate procedures and forms apply:

CP 5054.01 Personal Removal of Lab Property from the Premises — Package Passes (form BNR-97)

CP 5055.01 Interbuilding Shipments — Interbuilding Pass (form BNR-363)

CP 3104.01 Capital Assets and Materials on Loan — Authority for Shipment (form BNR-69).

19.20 PATENTS

Every permanent and temporary BNR employee, as a condition of employment, must sign an "Invention and Trade Secret Agreement" form BNR-148. You may submit patentable ideas or inventions on a "Disclosure of Invention" form BNR-36, as outlined in CP 1125.01 (Patents and Industrial Designs).

19.21 PAYCHECKS

Paychecks are distributed every two weeks. The stub outlines the pay period, gross pay, deductions, net pay, and company contributions. You may have your pay deposited directly into your account at any accredited financial institution. Contact the Benefits Department for the necessary forms.

19.22 PHOTOGRAPHY

The Photography Department will undertake many types of assignments, such as individual documentation and marketing photography.

You can obtain from this group duplicate slides, color and regular conference slides, black and white prints,

color prints, and color vugraphs. Any unique photography requests may be coordinated through this department.

Use a "Photo Work Order" form BNR-190 to request photographic services.

19.23 PURCHASING

To order goods and services, you must raise a "Purchase Requisition" form BNR-66, as outlined in CP 3202.01 and have said form duly authorized in accordance with CP 3203.01, Final Authorization. The Purchasing Department will then negotiate the purchase of requested goods and services with appropriate suppliers, and issue a "Purchase Order" form BNR-395 to the successful supplier.

19.24 REPRODUCTION/PRINTING

The Reproduction Department provides printing and copying services. Documents, stationery, books, forms, posters, and newsletters can be produced from camera-ready masters, whether these are produced by the Graphics and Illustrating Group or provided by you in the form of typewritten or computer-printed originals.

This group provides a complete bindery service, including collating, folding, stapling, drilling, padding, and cerlox binding.

You can enlist their services by completing a "Reproduction Order" form BNR-103.

19.25 SHIPPING AND RECEIVING

Any item you need to ship by commercial carrier is handled by the Shipping Department, who will pack and prepare documentation and labels using the "Authorization for Shipment" form BNR-69.

The Receiving Department handles all incoming shipments ordered from various suppliers; staff checks quantity, condition and kind, and forwards the appropriate receiving reports to the originator, Accounts Payable and Purchasing. They also deliver all items to their proper destination. Claims arising from discrepancies are also handled by this department.

19.26 STOCKROOMS

When you need frequently used items for office, business, facilities, or components, check first to see if your building has a stockroom, where you can obtain stationery and stock catalogs. These include all the items carried in stock and are updated monthly.

Material may be withdrawn from the various stockrooms by completing the appropriate form:

"Material Drawout Ticket"
(form BNR-133)

"Material Withdrawal Record"
(form BNR-139)

"Trade Stock Withdrawal Form"
(form BNR-141)

19.27 TELEPHONE/TERMINAL INSTALLATION

Contact the Communications Department to have telephone and computer terminals installed, moved, or repaired. This department will in turn contact the appropriate company or BNR department to schedule the requested service.

19.28 TIMESHEETS

You must complete a monthly "Timesheet" (form BNR-401 or BNR-402), on which you report the hours you spent on the various activities, as outlined in CP 3270.01.

19.29 TRANSPORTATION — INTERBUILDING

Regular interbuilding passenger service is available in Ottawa. Schedules are posted at various entrances, and are also available from the mailrooms.

19.30 TRAVEL

If you need to travel on business, use designated BNR travel agents at each location to prepare your travel arrangements, as outlined in CP 3224.01. Your travel is authorized on "Travel Order" form BNR-39, and you may draw cash advances on the "Requisition and Receipt for Cash" form BNR-70; account for your expenditures using the "Employee Expense Report" form BNR-94.

19.31 TYPESETTING

The Typesetting Department is responsible for high quality documentation output suitable for slides, vugraphs, brochures, and custom documentation.

19.32 VIDEO PRODUCTIONS

BNR has an in-house video production studio which produces training, public relations, marketing- and product-related video programs. The facility consists of a four camera studio, on- and off-line editing suites, and a tape library. Clients include all BNR divisions and Northern Telecom. The emphasis is on training, education, and developmental topics. For more information contact the Video Production Department.

19.33 VISITORS

Sign in visitors to BNR at the security desk.



The BNR/NT Club was formed as a social, cultural, and recreational organization where members could share interests beyond those of their regular employment.

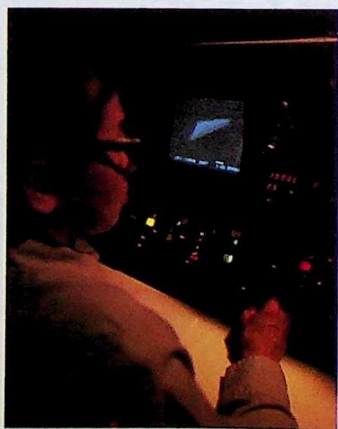
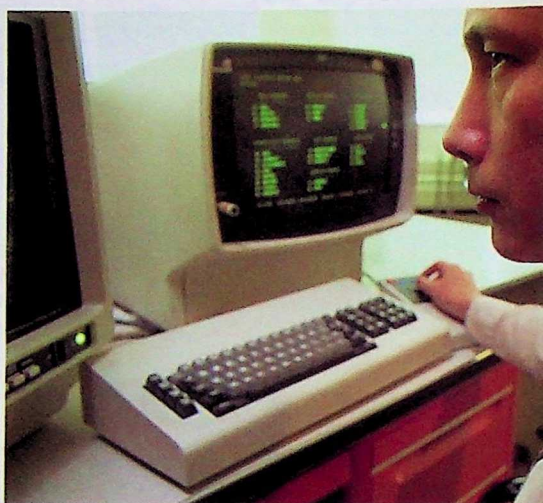
The BNR/NT Club executive is made up of one salaried coordinator and seven volunteers who hold the offices of President, Vice-President, Secretary, Treasurer, Activities Director,

BNR/NT CLUB

Social Director, and Service Fund Director. Each executive member (with the exception of the coordinator) is elected to office for a term of one year, usually May 1st to April 30.

The club sponsors 23 activity groups and has more than 4,000 members. Teams are sent to compete in the Northern Telecom Interdivisional Winter and Summer Games. Among the many social activities planned during the year, there is a Christmas Party for the children of employees.

For more detailed information on the Club, see the Club's booklet which is published yearly, and their quarterly newsletter, "Pulse".



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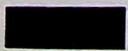
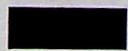
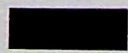
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For more information on BNR, or to add information to this Guide, contact the Assimilation Department, 8C10.





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