Communications Research Centre

HIGHLIGHTS

1996-1997

Chairman's Message

As Chairman of the Board, I am proud to present highlights of the Communications Research Centre's 1996-97 activities.

This was a transitional year for CRC, with Jacques Lyrette's departure as President in early 1996, followed by an intense eight-month search that culminated in the hiring of Gerry Turcotte as new President. We are extremely pleased to have Gerry join us under a five-year executive interchange program.

Gerry left the helm of the Ottawa Carleton Research Institute where he successfully developed a two-person office with an innovative R&D partnership concept into an organization with 230 members, 14 full-time employees and annual revenues of almost $4 million. His entrepreneurial drive, team building talents and vision of the future of communications are helping prepare CRC, as Industry Canada's communications R&D institute, to meet the demanding challenges of the coming century.

CRC has achieved notable success in its R&D and technology transfer programs. I point out three examples among many which show the depth and scale of CRC's innovation capacity. The multimedia broadband suitcase terminal developed by CRC engineers for civilian and military environments, is testimony to our expertise and leadership in advanced Ka-band satcom applications. Our fibre gratings licences and the sale of the CRC-COV radio prediction software are beginning to earn significant revenues.

I congratulate all CRC innovators who contribute to CRC's success and the employees who support them.

Bill Dunbar

President's Message

As the newly appointed president of this outstanding R&D institute of Industry Canada, I was eager to join Bill Dunbar and CRC's Board of Directors in laying out a strategic direction and a management framework for CRC at this most critical time for Canada's communications industries.

Budget restraints and the need to realign our organization to meet an exploding market in wireless communications are the current challenges CRC is confronting. After extensive consultation about the R&D outlook at CRC, we have committed to a new vision and mission which we believe will effectively guide CRC into the 21st century.

Our Vision is: National leadership in collaborative research and development in innovative communications, broadcasting and information technologies for a strong Canadian knowledge-based economy.

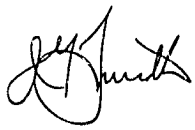
CRC's Mission is:

To be the federal government's centre of excellence for communications R&D, ensuring an independent source of advice for public policy purposes.

To help identify and close the innovation gaps in Canada's communications sector by:

- engaging in industry partnerships;
- building technical intelligence;
- supporting small and medium-sized high technology enterprises.

We are meeting these challenges together, helping to build a strong Canadian economy through R&D support to Canada's communications industries.



Gerry Turcotte

Throughout the 1996-97 fiscal year, CRC recorded significant achievements which further its mission to close the innovation gaps in Canada's communications industry, and which contribute to maintaining Canada's preeminence in telecommunications R&D. In this brief space, only a few examples are offered.

Collaboration, partnerships, alliances, cross-licensing agreements – these mechanisms, among others, represent CRC's emphasis on increasing the flow of industrially relevant R&D to Canada's communications sector, with the aim of creating more jobs and economic growth for Canadians.

Domestically, CRC has teamed up with private industry and other government organizations on projects with industrial promise. For example, advanced algorithms developed by CRC for its work on adaptive ("smart") antenna receiving techniques has been used by **SED Systems Inc.** to produce a **programmable HF adaptive antenna receiving system** in a collaborative project sponsored by the **Canadian Navy**. It is now being marketed for use in naval and air-to-ground communications systems.

Another way in which CRC's technical leadership benefits Canadian industry is in managing, on behalf of the Canadian Space Agency, the satellite communications portion of Canada's Long Term Space Plan (LTSP).

In managing this program, valued at over $22M in FY 96/97, CRC worked closely with industry in forecasting the evolution of satellite systems and technologies. CRC provides valued scientific guidance for various technology development contracts funded under the LTSP.

A major client for CRC continues to be Industry Canada's **Spectrum, Information Technologies and Telecommunications** Sector (SITT). In addition to providing technical support and contributions to a number of national and international standards committees, each year CRC performs specific in-house R&D tasks ranging from radiated emission measurements for cellular telephones to developing automated techniques for spectrum monitoring.

In optoelectronics, CRC, the **National Research Council** and **Nortel** are working jointly to develop an **eight-channel wavelength-division-multiplexing transmitter/receiver unit** for use in network systems experiments. These techniques are critical in developing the high capacity networks of the future.

In collaboration with **IMAX Corporation** and the **University of Quebec**, CRC is taking **stereoscopic television (3D-TV)** from a mere curiosity to market reality. This project is supported by a three-year strategic **NSERC** grant which also pays for a Post-Doctoral Fellow position at CRC.

From the workplace to home, preparing for the next generation of home entertainment technology, CRC joined with **NHK Laboratory** (Japan) and **Heinrich Hertz Institute** (Germany) to establish the suitability of the multiview profile of the **IS MPEG-2 standard for 3D-TV** through subjective evaluation tests.

Internationally, CRC engages with many countries in productive R&D ventures with industry, university and government labs to enhance the global positioning of Canada's communications industry. These communications R&D projects have implications that will affect people in the workplace as well as at home.

CRC's **BADLAB** (Broadband Applications and Demonstration Laboratory) is a prime example. Among its collaborative efforts is an arrangement with the **European Community** (represented by ten European organizations) to demonstrate the potential of **teleco-operative, computer-supported work** of national and international teams using distributed resources via high-speed networks. The design and modelling of aircraft parts was chosen as a representative high-technology environment for demonstration over broadband networks.

Collaborative Agreements

CRC signed a collaborative agreement with Korea's **Electronics and Telecommunications Research Institute** for R&D on **microwave circuit integration technologies and techniques for EHF communications systems**. This exchange will provide participation opportunities for Canadian companies in the semiconductor business.

CRC has collaborated on various innovative telemedicine demonstrations with the University of Ottawa Heart Institute and CIFRA Medical using satellite and broadband communications.

Contracting-in and Revenue Generation

Each year CRC engages in a number of contracts to provide research services to a wider variety of clients. For example, CRC completed research for the Canadian company **Square Peg**, undertaking communications signal design for mobile satellite multimedia services for the **European Space Agency**. Through simulation, CRC demonstrated the feasibility of multiplexed video and audio over a band-limited mobile satellite channel.

Also completed this past year, was a study of the relative merits of implementing Digital Radio Broadcasting by satellite at L-band versus S-band. This study was done at the request of the **Consumer Electronics Manufacturer Association**, a sector of the **Electronic Industries Association** of the USA, and formed the basis of their presentation to the US Federal Communications Commission. CRC also conducted this study so that implementation of DRB services in Canada and USA will harmonize at L-band.

The combined IP/contracting-in revenues for 1996-97 were $1.6M with IP agreements generating $702,000 and contracting-in agreements generating $973,000. There were 194 active patents on 75 inventions and 275 active agreements including 23 new licences this year. Of these 46 earned revenue from royalties or licences. Among the significant activities this past year was the $41,000 of IP revenues generated by the 12 licenses granted to Canadian firms and government departments for CRC-COV version 4 software. CRC-COV is a broadcast coverage, synthesis and prediction software useful in designing DRB transmitter networks.

CRC's original venture into cross-licensing as a means of increasing the utility and marketability of patents, has continued to generate significant revenue. Its portfolio of Bragg fibre gratings patents jointly held with United Technologies Corporation earned more than $500,000 over the last year. In addition to providing protection from patent infringement, cross-licensing can provide Canadian companies with access to off-shore technologies and new overseas markets.

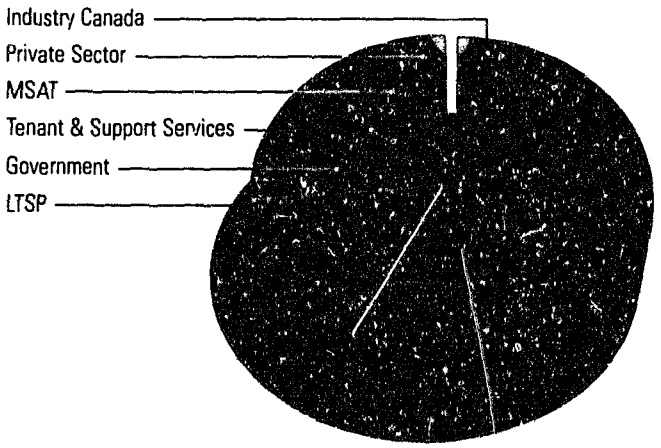
Our newest venture into cross-licensing will protect a joint portfolio of patents for fused biconical taper optical coupling technology. This agreement with **Toshiba** covers 19 patents held by CRC for seven inventions and seven Toshiba patents for two inventions.

Assistance to SMEs

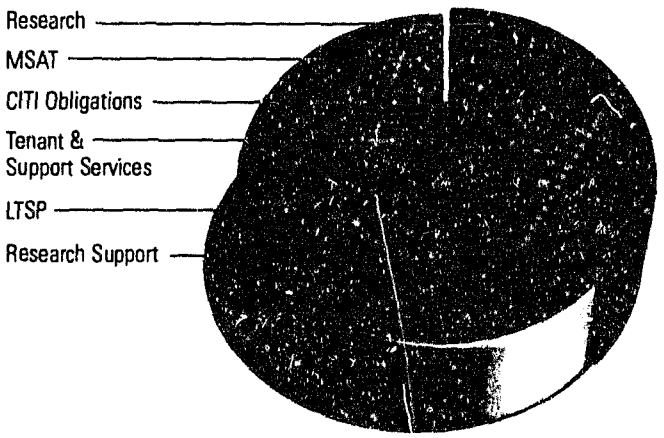
Through the **National Research Council's Industrial Research Assistance Program (IRAP)**, CRC has promoted and assisted such a significant number of projects in telecommunications – 70 in the last year alone – that a full-time IRAP industrial technical advisor has been assigned to CRC. This is the first time that an IRAP officer has been attached to a government lab outside NRC.

CRC's **Innovation Centre** continues to successfully support start-up companies. In 1996-97, Innovation Centre clients were: **Adaptive Antenna, Calljsto, Gandec, Greenlight, InfoMagnetics Technologies, and Square Peg**. Twice that number will be served in 1997 and planning for a major expansion has begun.

Financial report for the fiscal year 1996-97



Revenues	($000s)
Industry Canada	$35,351.6*
MSAT	3,600.0
LTSP	9,929.7
Government	6,100.0
Private Sector	2,639.8
Tenant & Support Services	3,858.4
Total:	**$61,479.5**



Expenses	($000s)
Research	$22,833.0
MSAT	3,600.0
LTSP	9,929.7
Research Support	17,725.0
Tenant & Support Services	3,858.4
CITI Obligations	3,533.4
Total:	**$61,479.5**

* Includes 3.5M for CITI budget and Departure Costs.

** LTSP: Long Term Space Plan

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Centre de recherches sur les communications

Industry Canada Industrie Canada

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