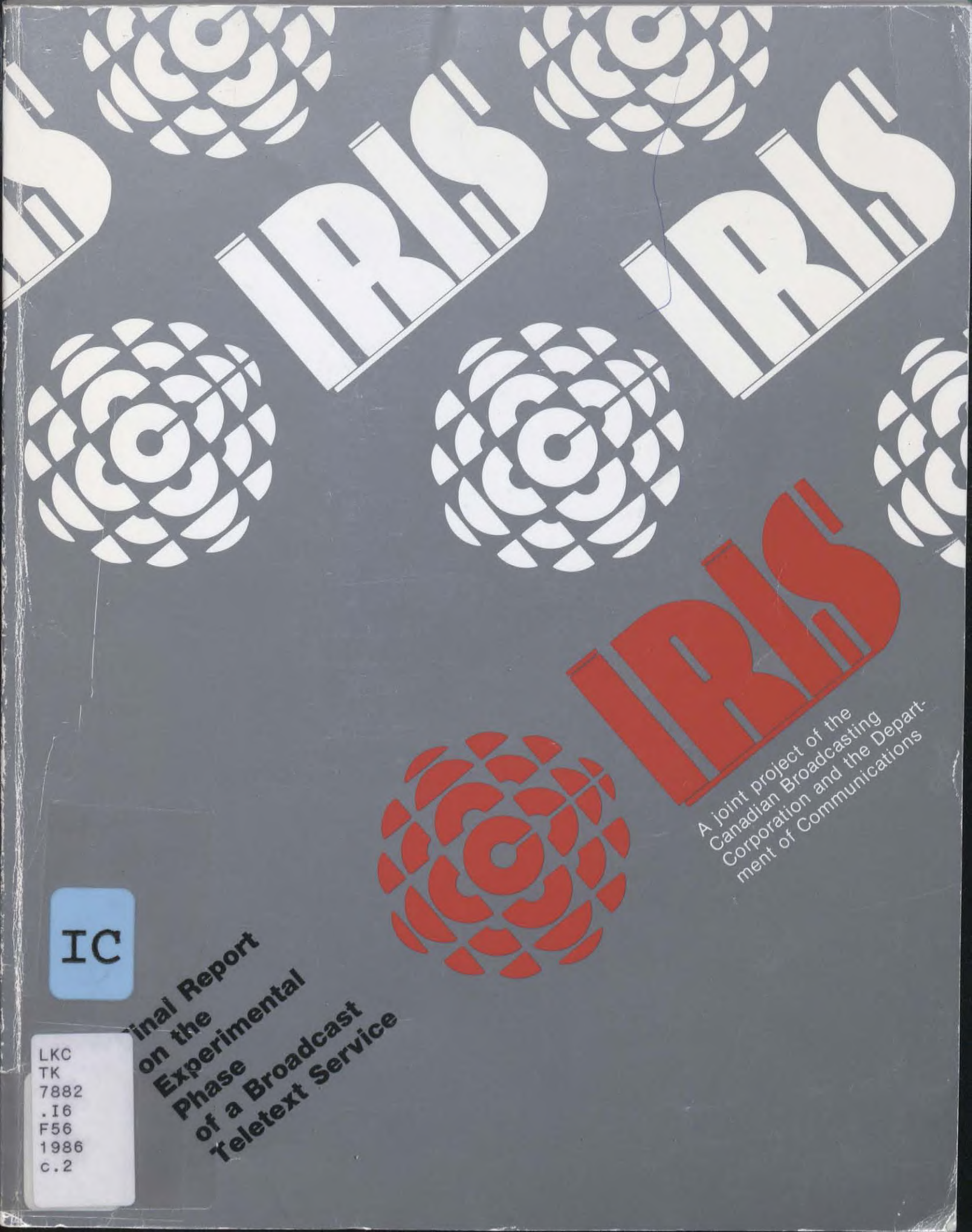


IC

Final Report on the Experimental Phase of a Broadcast Teletext Service

LKC
TK
7882
.I6
F56
1986
c.2

Canadian Broadcasting Corporation
Société Radio-Canada

Available from:
CBC Enterprises
P.O. Box 6440, Station "A"
Montreal, Quebec
Canada
H3C 3L4

Telephone (514) 285-4040
TELEX 055-61247

Publication disponible également en français.

Final Report on the Experimental Phase of a Broadcast Teletext Service

A Joint Project of the
Canadian Broadcasting Corporation
and the Department of Communications

Industry Canada
Library - Queen

JUIN 1 3 2013

Industrie Canada
Bibliothèque - Queen

EXECUTIVE SUMMARY

In November, 1981, the Minister of Communications and the President of the Canadian Broadcasting Corporation signed a Memorandum of Understanding whereby the latter would carry out a trial of a teletext service based on an implementation of the Telidon technology. This technology, which has been under development by the Department of Communications since 1978, represents an application of modern computer technology to develop a service which will bring into the home, information stored in computer data banks for display on conventional television receivers: a relatively simple additional circuit called a decoder must be added to the receiver to display the service. The information may reach the home either via the switched networks of the telephone operating companies or be carried along with the standard television signal: the former service is called videotex, the latter teletext.

The trial, called Project IRIS for Information Relayed Instantly from the Source, has been carried out and was completed in December, 1983. A total of $7.164 million was invested of which $1.0 million came from CBC's own budget.

The objectives of the trial were first to obtain a reaction from the public to the service and second to provide the stimulus for developing an industry which could supply the goods and services for other teletext systems both at home and abroad. Both objectives have been met.

The service offered to the public was generated in Montreal and Toronto and consisted of a magazine of approximately 150 pages under viewer control to gain access to such information as news, weather, sports, community events, finance, resource information, consumer items,

...

program schedules, movie and theatre reviews, restaurant guides and any other information deemed appropriate at any given time.

Decoders were distributed in about 100 households in Montreal for evaluating the French service and another 100 in Toronto for the English service; some decoders were placed in public places in Calgary and were fed by the English network. The results, after extensive audience research carried out in two distinct phases, indicate that more than half of those given the opportunity to try out teletext in their homes chose to do so; this speaks well for the initial attractiveness of the service. When approached to establish how many would be prepared to continue with the second phase, between two thirds and three quarters agreed to do so.

This investment, when considered in conjunction with that spent in developing videotex services, has allowed Canadian industry to develop a broad teletext capability with an appropriate infrastructure in such areas as hardware, software, information providers, delivery systems, management and systems planning for turn-key systems. In addition, standards for equipment design, transmission and reception have been put into place and have been accepted for North America and for Europe. Telidon technology has been recognized internationally along with its European competitors Ceefax and Antiope. While the three technologies have equivalent capability for the presentation of textual matter, Telidon offers a far superior graphics capability.

As for the future, there are good indications that a teletext service will be attractive to a large number of Canadians. The experience in the U.K. where 1.6 million teletext decoders are in service is an eloquent confirmation of the acceptance of the service. In Canada, the high cost of decoders has hampered service penetration but now that standards are in place, manufacturers of television sets

...

fitted with a teletext capability may embark upon quantity production with confidence. It is expected that the add-on cost of a decoder in quantity production will sell for as low as $60.

For the broadcaster, implementing a teletext capability is an attractive service which can be added to the existing plant at a very low incremental cost and which, when used in conjunction with the radio and television services, can generate new revenues from the advertising which it can carry.

Robert O'Reilly
Office of the Executive Vice-President
Canadian Broadcasting Corporation

CONTENTS

1. Introduction

2. Project IRIS - a teletext trial.
   - 2.1 Lead-in to a trial
   - 2.2 Implementation
   - 2.3 Internal CBC management of Project IRIS.
   - 2.4 System configuration
   - 2.5 Development of standards
   - 2.6 Equipment procurement and development
   - 2.7 Development of the service offering
   - 2.8 Captioning service
   - 2.9 Approach to advertising

3. Experimental Results
   - 3.1 Objectives reached by Project IRIS
   - 3.2 Audience research
   - 3.3 Industrial capability development

4. Assessment of the future of teletext services
   - 4.1 General comments
   - 4.2 Economics of broadcast teletext
   - 4.3 Role of affiliate stations
   - 4.4 Competition
   - 4.5 Developing service penetration

5. Conclusion

List of Illustrations
- 1 - Organization of CBC management team for Project IRIS
- 2 - Project IRIS Teletext System Architecture
- 3 - CBC Project IRIS field trials systems development and components acquisition cost
- 4 - List of advertisers in Project IRIS field trials (1983) (Toronto)

1. INTRODUCTION

This report provides a detail description of the teletext delivery system which was placed in operation and the service which was offered to the public in Montreal, Toronto and Calgary. Its main thrust is twofold: to evaluate the reaction of the public to this service transmitted in both French and English, and to describe the industrial capability which was developed in so doing. An assessment of the future of teletext services arising from this investment of public funds is also given.

Telidon is an advanced information communications technology which is best known for its capabilities enabling the public to view graphical and textual information stored in remote data banks by using a variety of delivery systems such as a standard telephone line or a standard TV broadcast signal and a decoder connected to a conventional television set. In the case of the TV broadcast, this service is called teletext.

At the heart of the Telidon technology is a unique computer coding scheme consisting of Picture Description Instructions (PDIs) which permit encoding pictorial information in a very compact form thereby reducing drastically the quantity of information to be transmitted. The ability to transmit and display superior graphical information places it well in the lead when compared to competing systems from France and the U.K.

Telidon was developed by the Communications Research Centre of the Department of Communications. It was announced in August 1978 and by the end of 1983 government and industry had invested well over $200 million in developing products and services based on the use of this technology; of this sum, 10% to 15% had been invested in teletext trials and the related technology.

The significant milestones arising out of this investment as they relate to teletext in Canada have been the implementation of a number of trials to test the technology and the potential acceptance by the public of such a service starting with

TV Ontario (1979) and leading to a large-scale trial with CBC (1981). Sales to the U.S. of broadcast teletext systems involving Telidon technology have been made to the Alternate Media Center of New York University (1981), TIME Inc. (1982), the University of Alaska (1983), CBS (1984), the U.S. National Captioning Institute (1984), NBC (1984) and WIVB - Buffalo N.Y. (1984).

The teletext service may be in the form of a magazine of approximately 150 pages of information transmitted via an unused portion of the television signal - the vertical blanking interval (VBI); this is the case for the CBC trial. The service may also be offered in the form of a full television channel dedicated to carrying pages of information rather than carrying a television programme resulting in the number of pages being increased to several thousand. In both cases, any page may be selected by the user whose TV set is fitted with a decoder and may be retained on the screen as long as desired. The costs of the service are absorbed by the broadcaster although advertising revenues may reduce them as the service gains acceptance.

2. PROJECT IRIS - A TELETEXT TRIAL

2.1 Lead-in to a trial

CBC recognized the importance of the Telidon technology as a means of providing a broadcast teletext service and in December 1980, it had completed a study on such a service. The study outlined a trial phase as a lead-in to an operational service which was to be carried out over a three-year period with a budget of $6.1M. It was

this study which formed the basis for a subsequent proposal to Cabinet.

On July 7, 1981, the Committee on Economic Development approved a proposal submitted by the Minister of Communications in Cabinet Memorandum 292-81 (MC) to implement the first stage of a national teletext service using Telidon technology through co-operative DOC/CBC activities. Funding for this proposal was subsequently approved by Treasury Board in November 1981.

This proposal, in outline, provided for the system design, completion of component development, manufacture and procurement, installation, operation and evaluation, over a 3-year period, of 2 full working systems: one in English in both Toronto and Calgary and one in French in Montreal. Some 700 Telidon terminals were to be used, in phases, to determine the response of approximately 1400 households to the service as well as to provide public access to the service at all CBC regional centres.

Project activities were to be directed to the attainment of two broad objectives: economic development of the Canadian industrial Telidon capability on the one hand and on the other, implementation of a trial broadcast teletext service serving as the forerunner for an operational service.

To manage the project, an Order in Council under the Broadcast Act, subsection 39(2) provided for the CBC to act as the agent of the Minister of Communications in the conduct of the trial. To implement this relationship, a Memorandum of Understanding (MOU) was signed by the Minister of Communications and the President of CBC on November 26, 1981.

The total project costs were estimated to be $6M; of this, provision of $1M was made from DOC's Augmented Telidon Program Funding approved on July 16, 1981.

The funding allocated to the project was a follows:

	FY 81/82	FY 82/83	FY 83/84	TOTAL
CBC($'000)	800	3400	800	5000
DOC($'000)	200	400	400	1000
TOTAL	1000	3800	1200	6000

To the above was added in FY 82/83, $700K from the Industry Investment Stimulation Program (IISP)-($350K from DOC and $350K from CBC). At the end of FY 83/84, a further amount of $464K was added ($300K from DOC and $164K from CBC) to fill the gap between exhaustion of original funding and start of new funding for the follow-on developmental teletext service starting on 1 April, 1984, thus making a total of $7.164M available to implement the project:

$6.164M for CBC and $1.0M for DOC. To the above must be added some indirect costs by CBC attributable to the participation of its corporate staff and other services from the Corporation such as computer services, engineering, research services, industrial relations, advertising et al; this investment is estimated at $1M.

2.2 Implementation

Implementation of the MOU was overseen by a Joint Committee co-chaired by CBC and DOC whose purpose was to ensure that the field trial was carried out in agreement with the objectives set out therein. The Joint Committee met an average of once a month from the outset.

The Joint Committee served a most useful purpose in that it provided overall direction to the project during its evolutionary stages and ensured at all times that the best possible compromises were selected between the traditional factors of cost, schedule and performance. The Joint Committee acted to re-orient the Project on two occasions. The first occasion arose on February 16, 1982 when the costs to implement the programme had risen to $7.9 million resulting in a shortage of $2.2 million, only $5.7 million being available to CBC. The Joint Committee approved a programme costing $6.7 million, which, although it still left a shortage of $1 million

was considered acceptable at the time in the light of anticipated savings as the technology developed. The reduction in scope was as follows:

- 500 decoders rather than 700 decoders for installation in 1100 households rather than 1400,
- reduction by 25% of the time during which decoders were left in households and
- reduction of personnel in the Montreal and Toronto teletext centres.

The second occasion arose when the Joint Committee acted to re-orient the programme on November 23, 1982 because the costs had again climbed this time beyond the $6.7 million estimated in February 1982; these now stood at $8.4 million. The Joint Committee approved a programme which would be allowed to run until the $5.7 million available to CBC ran out. This was estimated as being August 1983 rather than the original date of December 1983; the August date was subsequently stretched to October 1983. By so doing, the scope of the audience research activity was reduced considerably as was the installation plan for placing decoders in households; the total number of decoders, however, was left unchanged from that established in February, 1982.

Towards the end of calendar year 1983 when the funding was nearing exhaustion and following an agreement between CBC management and DOC, it was decided to reduce the national teletext service to a strict minimum thereby extending the trial to 31 March, 1984.

On these occasions, the Joint Committee was faced with two principal driving forces:

a) Norpak, as the supplier of the decoders, faced increasing costs in developing decoders. Changing standards and the consequent impact upon the decoder design, both of which were simultaneously in a state of flux, made it very difficult to predict manufacturing costs. Since the cost of decoders represented about 20% of the total cost, any increase had a considerable impact. The introduction of the 5.72M bit/sec. data rate for transmissions via the VBI and of the Presentation Level Protocol (PLP) by AT&T, (subsequently adopted by CBS and DOC in May, 1981 as a basis for a North American standard) had forced CBC to pursue its industrial development objective while still moving along with the development of new standards and supporting their North American adoption.

b) CBC had estimated its costs originally on information provided by DOC and arising out of the projected trial at WETA in Washington, DC. As it turned out, the system architecture of this trial, the level of development of the technology and the operational experience available at the time bore little

resemblance to Project IRIS in respect to the scale of endeavour. CBC was breaking new ground.

2.3 Internal CBC management of Project IRIS

Figure 1 describes the management structure implemented within CBC to carry out the mandate outlined in the MOU. In principle, it was based on the project office approach drawing upon various services within the Corporation to carry out its tasks and being the responsible agent for working with government and industry to do so. CBC was thus able to bring together a wide variety of skills and experience to focus on the planning and progress of the trial. The project office was managed by a Project Director who reported, within CBC, to the then Assistant Vice-President, Corporate Affairs and to DOC via the Joint CBC/DOC Board of Control. While responsible for day-to-day management, the Project Director also chaired the Corporate Teletext Management Committee (CTMC) which coordinated the inputs from within the Corporation as well as from DOC. The CTMC met regularly every month to review progress and to offer guidance. The project was broken down into several hundred work activities which were reviewed regularly with respect to an overall schedule. In addition, the Project Director tabled monthly financial reports giving analyses of costs incurred and forecasts of financial trends to completion. The CTMC played an important role throughout the life of the project, particularly so at the time when the trial had to be reduced in scope while still assuring a wise expenditure of public funds. Thus, the CTMC contributed considerably

to an effective evaluation of the teletext trial and to the determination of its potential role vis-a-vis the radio and television services of CBC.

It is noted that the CRTC was represented at meetings of the CTMC acting as an advisor to the project; an important outcome of this representation was the permission to use specific lines of the VBI to transport teletext signals.

2.4 System configuration

The system configuration to generate the service, to broadcast it and to bring it into the user's home is the subject of this section.

The approach taken by CBC to devise the system architecture was based on the following requirements:

- offering two teletext services, one in English, and one in French;
- transmitting a mixture of national, regional and local information content;
- distributing a service which was on-line or real time, bypassing the regional delay centres;
- offering the ability for the regional production centres to service their local communities;
- permitting the two national production centres to function equally as regional and local undertakings;

- ensuring that the architecture for Project IRIS could be applied later to a national system. With this in mind, every production centre had to have the flexibility to create its own broadcast cycle using the national content available from the incoming network signal, the regional content from the regional production centre and the content generated locally.

Figure 2 describes the architecture of the teletext transmitting system to implement the above requirements. Each of the three teletext centres can generate and update pages but more important is the role of the decision centre. A controller at each centre is responsible for total control of the content of the magazine; it is he or she who selects and orders the pages which constitute the cycle to be inserted into the VBI. In the event of a breakdown of the host computer, the controller can exercise manual over-ride and insert pages as the situation demands; this is a particularly important function since it ensures that the user is fed up-dated information - a vital requirement in the event of an emergency. In short, the decision centre has full responsibility for scheduling, auditing, controlling quality and monitoring the content of the magazine.

In order to minimize the cost of data communication between the host computer and the teletext centre, an encoder/inserter is required for each television program output to the network and to the local transmitter. The encoder has a storage

capacity of approximately 400 pages, and can assemble dynamically a broadcast cycle or magazine of approximately 150 pages from any possible combination of these 400 pages. By judicious use of equipment and system design, Toronto and Montreal required but one encoder each operating in the multi-feed mode; the hardware available at the outset of the project indicated a quantity several times this number, thereby representing a considerable cost saving. All command functions are dictated by the host computer in the form of scheduling commands it receives from the appropriate decision centre. The broadcast cycle can be continuously updated throughout the broadcast day - some 18 hours - and transmitted on lines 15, 16, 18 and 20 of the television signal VBI. The cycle to be broadcast via the VBI was designed for operation in the shared mode. Pages dedicated to national content could not be altered by stations along the route but the pages intended for regional/local consumption could. For example, the teletext controller in Calgary could not remove the former from the cycle but could replace the latter with regional/local content intended for Alberta audiences. The functions performed by the encoder/inserter are enumerated in Figure 2.

The data base located in the central host computer in Montreal contains all the pages necessary for the two teletext services, including those from all television production stations, from which it will manage all broadcast cycles to be assembled at each teletext centre. The functions performed by the host computer are enumerated in Figure 2.

systems performance must conform to the relevant DOC procedure (BP 23) and implicitly should be capable of carrying teletext signals in a satisfactory manner; slight degradations appear to perturb otherwise satisfactory teletext reception.

2.5 Development of standards

Right from the outset, the development of standards posed some difficulties for system designers, equipment suppliers, service operators and users. Telidon was a new technology and competing technologies from the European scene were, and still are, vying for the North American market.

As early as September 1980, CBC personnel have collaborated closely and on a continuing basis with a variety of organizations and government agencies dedicated to the promotion of videotex and teletext service, to the related standards and to the development of common practices for broadcasters.

One such organization, called VISPAC (The Videotex Information Service Providers Association of Canada), was formed, inter alia, to promote standards leading to the compatibility of videotex systems, to promote the protection of the intellectual property of its members, and to serve as a means of making known to government the interests of its members. In this context, the term "videotex" is used in its generic sense to include both teletext and videotex services; the latter term, when used in a particular sense,

The receiving system consists of a standard TV receiver to which is fitted an added capability called a "decoder" either in the form of an integral part of the receiver or as an external unit of a size comparable to the cable converters today. Project IRIS used the latter form. Decoders were supplied to a number of selected households and public places for Montreal and Toronto but only in public places for Calgary.

Project IRIS provided signals to all CBC transmitters thereby making the broadcast teletext service available to all households capable of receiving CBC network signals and equipped with suitable decoders. In operation, TV signals, normally fed to the user's TV set from a private antenna or from a cable distribution system are connected to the decoder and the output from the decoder is connected to terminals of the TV set normally fed by the antenna or cable. No modifications are made to the TV set. A small hand-held remote keypad is supplied with the decoder to allow the user to select TV channels remotely and to transfer the screen display from the TV programme to the teletext service.

For Project IRIS almost all decoders were fed via cable because of the higher reliability and quality of signals. A test of signal quality was carried out in every home prior to installing a decoder. In practice, most homes selected received an acceptable quality of signal but in some cases the quality was marginal. In the latter case, it was necessary to search for new homes resulting in higher operating costs for CBC. It is noted that cable television

relates to the application of Telidon technology to transmit information from a variety of computer data banks to TV receivers via the switched networks of the common carriers.

Another organization, the Canadian Videotex Consultative Committee (CVCC,) brought together representatives from all walks of life interested in the promotion of videotex and teletext. Reporting to the CVCC General Assembly, CBC personnel from Project IRIS management organized and chaired the activities of the CVCC/Teletext Sub-Committees which included representatives from all major broadcasters, equipment suppliers, software houses, the cable operators and from government. An important outcome of the work of the CVCC was its contribution to the development of two standards: the North American Presentation Level Protocol Syntax (NAPLPS), applicable to both teletext and videotex, and the North American Basic Teletext Specification (NABTS).

NAPLPS was adopted in December 1983 as a standard for North America by a joint committee of the American National Standards Institute (ANSI) and the Canadian Standards Association (CSA). NABTS was adopted in March 1984 as a standard for North America by a joint committee of the U.S. Electronic Industry Association (EIA) and the CVCC. Not only was CBC a regular participant in all the negotiations leading to the adoption of standards, but it played a vital role in sensitizing the "Telidon community" to the fact that standards for videotex services could not be applied directly to teletext services; the needs of broadcasters in terms of their practices and of

regulations governing their operations could not be met by videotex standards. An example of this is the need for broadcasters to transmit a teletext service which contains such information as identification, time, date, choice of language, channel number, page number and search indicators; collectively these have been labelled "Record Type 2". Provision had been made in a general sense to include such parameters in BS 14, a DOC broadcast specification issued in June 1981, but it remained for NABTS to specify these functions in detail. The success of Project IRIS weighed heavily upon the adoption of standards to ensure that the Telidon technology was not unduly hampered in its market penetration by the competing foreign technologies working hard to make inroads into the US market (Antiope and Prestel from France and the UK respectively). Manufacturers may proceed with confidence to incorporate a teletext capability into their TV receivers now that the standards have been put into place.

2.6 Equipment procurement and development

Figure 3 shows the breakdown of the funds spent by Project IRIS in industry to procure services for systems development and to acquire components be they hardware or software. The largest sum of money went to Norpak Limited for the supply of decoders, inserters, page creation terminals and related hardware.

2.7 Developpment of the service offering

The service offered to the user by Project IRIS was conceived as two daily information magazines, one in French and one in English. The content for these magazines was generated in three teletext centres: Montreal for the French, Toronto and Calgary for the English. The trial service really tested a new editorial concept in a new medium in Canada. The initial programming consisted of sections devoted to news, weather, sports, community events, finance, resource information, consumer items, program schedules, movie and theatre reviews, restaurant guides and any other information deemed appropriate at any given time. Updating of the programming from each teletext centre is carried out several times daily according to the perceived needs of viewers.

The magazine is organized into pages each of which comprises anywhere from one up to five leaflets or overlays. At the time of page creation, a framework is generated which remains the same for a number of television screen displays; the leaflets simply become apparent "displays". This is a new development by the CBC, making it possible to increase the apparent number of TV screen displays available to the user without increasing the access time; currently it averages at about 10 seconds. The overlay system can be effective, for example, in providing several displays of text in a continuing story, or as overlays on a weather map. Thus, as was the

case for Project IRIS, a magazine of 150 pages amounts to approximately 250 distinct television screen displays of text and graphics when the leaflets are counted in.

For the generation of content, CBC adhered to its basic journalistic principles developed for radio and television services. The CBC takes no editorial position in its programming; stories are reported factually and objectively. The journalistic policy of the CBC rests on certain premises which characterize the Corporation's philosophy whereby the broadcasting spectrum belongs to the people who are entitled to hear the principal points of view on all questions of importance. The full interchange of opinions is one of the principal safeguards of free institutions. Journalistic principles adopted by CBC as a broadcasting institution also apply to teletext which must provide accurate, truthful, fair and thoroughly researched information.

Supported by the research work of W. Treurniet of DOC and the experience acquired with the current form of captioning, CBC decided that a lettering size corresponding to a 16 x 32 character screen size was most suitable to a viewer reading teletext when sitting more than 5 feet from an average size television receiver. The research indicated that the occasional use of the 20 x 40 character screen page format was tolerable but tiresome.

The 16 x 32 character screen size, when combined with the leaflet function, offers the viewer approximately 250 television

screen displays in a typical broadcast cycle at a given time resulting in a transmission of information with more clarity than with a 20 x 40 character screen page format.

The quality of Telidon-based colors and graphics were tested with success during Project IRIS. It is possible to display simultaneously with this technology any 16 of 4096 colors.

Project IRIS used various background colors to identify sections of content in a broadcast cycle to make viewers familiar with a particular section while going from one section to another. This superior graphics capability was exploited during Project IRIS by the presentation of entertaining games, quizzes, stories for children, and also to support advertising.

2.8 Captioning service

Closed captioning services for the hearing impaired have been offered by the CBC for some time based on technology developed by the U.S. National Captioning Institute (NCI) and transmitted on line 21 of the VBI. During Project IRIS, the line 21 captions were transcoded to Telidon format for insertion in the teletext service. The Canadian Captioning Development Agency (CCDA), formed in June 1982, makes captioning available to CBC in the Telidon

format but it cannot yet be inserted in the teletext service because of the lack of interface equipment. It is expected that the Telidon format in teletext will gradually replace the NCI format on line 21 as the affected public gains access to teletext decoders.

Telidon technology, in addition to its capability for offering service in French and English also offers a variety of improvements which are not possible with the NCI format: coloured captions which may be located anywhere on the screen, the mixing of text and icons to denote such information as musical notes, noises, and finally but certainly not the least, service in the non-Roman characters of native languages and ethnic groups. The technology behind the teletext service, in effect, provides the capability of simultaneous multi-lingual captioning. In addition, the captioning capability forms the basis for developing program support services such as NEWSFLASH, direct commentaries of major events such as news, special events, elections and multi-lingual services in response to the needs of various special interest groups.

Teletext alone, as an important source of information, also becomes a "printed radio" for the 1.5 million Canadians whose hearing is impaired.

2.9 Approach to advertising

The objective of Project IRIS in respect of advertising was to study the application of existing policies and to introduce changes as required by the introduction of this new medium.

The project office imposed the following limits on commercial content:

1) In accordance with CBC policy, no advertising was included in those portions of the magazine dealing with news, religion and text for children;

2) Other sections in the main cycles could contain:
   - one full page of advertising per ten pages of content, averaged over all sections;
   - billboards of one or two lines on all other pages;

3) Certain sub-cycles could be designated and reserved totally for full-page advertising;

During the Toronto field trials, the position and duration of all advertising (full page and billboards) was left to the discretion of CBC and no guarantee of fixed position or length of time was given to an advertiser. All commercials used during the field trials were rotated among the clients so that all advertisers had access to pages that were expected to be more popular, such as sports scores and weather.

Major advertising agencies were invited to participate in Project IRIS. National as well as local advertising was used to test viewer reaction.

While private firms prepared pages for advertisers, CBC teletext personnel provided training to the outside page creators so they could deliver the material to Project IRIS specifications. Finally, each advertising page was reviewed by CBC teletext staff to

ensure that each commercial matched the overall style of each service.

During the field trials, six advertising agencies worked with Project IRIS personnel in Toronto to generate content for some 18 clients; Figure 4 is a list of these advertising agencies.

In Montreal, four agencies supplied content for three customers to deal with three distinct types of advertising: the service sector, consumer goods and social responsibility. The limited number of equipments and of trained personnel in Montreal to create the advertising resulted in a reduced level of activity when compared to Toronto.

The advertising agencies' participation helped to evaluate the commercial potential of teletext in an operational environment by aiming to:

(1) gauge the degree of consumer acceptance of this mode of advertising;

2) acquaint the business community with teletext technology, thereby contributing to its promotion;

3) obtain feedback from advertising agency specialists in communication and promotion.

3 EXPERIMENTAL RESULTS

3.1 Objectives reached by Project IRIS

The MOU imposed two types of objectives for Project IRIS: economic development objectives and CBC objectives. The tabulation given below summarizes the results achieved for both types.

Economic Development Objectives	Results
1- To assist in defining and establishing a strong Canadian-based electronic publishing industry for the application of Telidon technology to television broadcasting.	To implement Project IRIS, CBC developed three teletext centres employing 25 people. These centres applied the same professional standards developed within the CBC for its TV and radio broadcasting operations. The centres drew not only upon existing CBC information sources, correspondents, editors and wire services but also upon outside information sources, such as Environment Canada for weather information, and others to maintain and up-date the complete information base which is normally available for broadcast purposes. The teletext centres provided useful feedback on the design of the equipment and

	implementation of standards and contributed to the development of a style of writing and editing suited to the medium.
2- To expand Canadian industry to produce system designs and electronic products that relate to teletext; to this end, all goods and serevices purchased under this program will be from Canadian industry.	About 95% of all goods and services were procured from Canadian sources. This investment permitted Canadian companies to supply other teletext systems both at home and abroad.
3- To contribute to the confirmation of the teletext specifications, based on Telidon technology, as the standard for both North America and the rest of the world.	CBC chaired and continues to do so, the teletext sub-committee of the CVCC, which includes broadcasters, cable operators, manufacturers and producers of content and which has been responsible for working with the U.S. Electronics Industry Association to develop teletext standards for North America. This resulted in

	the North American Basic Teletext Specification (NABTS) published in March 1984 and which was largely based on Telidon technology.
4- To examine new potential uses of Telidon technology in the broadcast mode;	Basic television electronic production support such as captioning, NEWSFLASH, remote relay transmitter identification including local community information, have been shown to be practicable.
5- To obtain feedback concerning the optimum design of teletext systems in the CBC broadcast environment.	In spite of budgetary and time constraints imposed upon Project IRIS, the trial has generated data which allow CBC to plan an operational system for equipment and system designs, teletext page creation centres, broadcast centres and related test equipment.

CBC objectives	Progress to date in achieving objectives
1- To evaluate general public user response to the information content, presentation and access time in order to plan data bases properly with national, regional and local content for the CBC English, French and Northern services.	See Section 3.2 below for details in this connection.
2- To evaluate CBC's capacity to use teletext as a vehicle to distribute information across the country to general, selected or targeted publics.	Ibid.
3- To evaluate teletext as a tool to provide program support in	The use of captioning and NEWSFLASH was developed and

content and distribution (including captioning) to existing CBC TV services.	implemented during Project IRIS. Several experimental applications of the Telidon technology to the television medium were also carried out in Montreal: (a) SNAP-CRACKLE -POP music programme on the English Network and the TRABOULIDON children's programme on the French Network used animation sequences created in teletext format, (b) reports on the general elections, on weather and on the Pope's Visit.
4- To recommend to CBC management proper action to be considered for the next phases, such as service introduction and build-up of a full teletext service.	Data and experience available to date have provided a sound basis for proceeding with confidence toward the implementation of a follow-on developmental teletext service by CBC in conjunction with its privately-owned affiliated stations.

3.2 Audience research

Research designed to assess the likely impact of a broadcast teletext service on the Canadian public was closely integrated into Project IRIS field trials. Teletext decoders were installed in a representative, randomly selected sample of some 150 francophone households in Montreal and 175 anglophone households in Toronto. A number of methods of measuring use of and reactions to this new means of communication were devised.

Initially the households were to have been supplied with decoders for a three-month period following the launching of the IRIS teletext service in April, 1983, but upon discovering that quite a number of the trial households were suffering technical problems it was decided to extend the trial into the fall months. Households that had major technical problems that could not be remedied, households that had not co-operated fully in the research and those that did not wish to continue participating were dropped from the trials and were replaced by a roughly equal number of new randomly selected households.

Thus, the trial was divided into two phases. Each phase had about 100 participating households in Montreal and 100 in Toronto. Most of the information on use of teletext is drawn from the second phase of the trial, when technical conditions stabilized, although the opinions of all household heads (including the dropouts) who had contact with teletext are noted where they seemed relevant.

Findings concerning the ways in which people watch teletext were gleaned primarily from a diary in which individual

household members recorded their use of teletext on a page-by-page basis during the week of November 21-27, 1983. Some 90 households in Toronto and 95 in Montreal returned diaries thus providing information on the viewing behaviour of about 260 potential viewers in each city. The diary data are supplemented with information obtained in two interviews with each of the household heads. The first interview was conducted shortly after the decoders were installed in the home; the second was conducted after the decoders had been removed, at the end of the trial.

3.2.1 Acceptance of teletext

One of the initial tests of teletext's potential appeal was the proportion of households that would be willing to participate in the trial. During the recruitment process interviewers described teletext, showed prospective participants colour photographs of sample teletext pages and left literature outlining both the project and the obligations which the trial would entail. A few days later the households were contacted in order to learn the families' decisions.

Roughly half the households that were approached agreed to join the trial.

A comparison of the characteristics of those who accepted the offer to participate, with those who rejected it, was made in order to gain an indication of the types of people who are apt to be initially attracted to teletext and, by extension, in order to gauge the type of person who might become the early adopters of teletext if it were to become more widely available.

The 'acceptors' of teletext in this trial were found to have many characteristics in common with other early adopters of new products, namely being younger and better educated than the general population. These acceptors were also more likely than the non-acceptors to perceive themselves as being among the first or somewhere in the middle when it came to adopting new products. This perception of themselves was borne out in fact. The acceptors were significantly more likely to own products such as personal computers and video cassette recorders. The acceptors were also more likely to be light television viewers, a characteristic that is typical of the younger and better educated segments of the population.

Another test of teletext's appeal was the proportion of households who, when given the chance at the end of the initial research phase, accepted the offer to keep their teletext decoder and continue into the second phase of research. Of those that did have the chance, 64 per cent in Toronto and 77 per cent in Montreal chose to keep their decoders.

3.2.2 How teletext was used

Someone in approximately 80 percent of the households in Toronto and Montreal watched teletext at least once during the diary week. In Montreal, nearly three quarters of the potential users (i.e. individuals aged seven years and over living in households that returned a diary) watched teletext once during the week. In Toronto, only 55 per cent did so. The average Montreal potential user spent about 1 hour a week watching teletext. In Toronto the figure was

about 25 minutes a week. These figures can be compared with the amount of time the average Canadian spends watching television and listening to the radio, which averages around 24 hours a week for television and 18 hours for radio.

Teletext users in Montreal watched, on average, 3.5 times a week; in Toronto the average was 3.0 times a week.

As well as watching it more frequently, Montrealers tended to spend greater lengths of time watching teletext than Torontonians did. The typical teletext viewing session in Montreal lasted 19 minutes, while that in Toronto lasted 11 minutes.

During these sessions an average of 21 'pages' were accessed in Montreal; in Toronto the average was 14 'pages'. The term 'page' was used as the basic measurable unit in the IRIS magazine. These pages could consist of more than one television screen or 'leaflet' of text and graphics - in practice most pages consisted of between one and three leaflets.

These average figures, while useful, conceal a great deal of variation in teletext viewing behaviour. Many teletext users (roughly one fifth in Montreal and one third in Toronto) watched IRIS only once during the diary week, while a few in each city watched eight times or more.

Similarly, many sessions (roughly one fifth in Montreal and nearly one half in Toronto) lasted less than 10 minutes, while a few extended to 40 minutes or more. The same wide variation is

also noted for the number of pages accessed per session. In roughly 10 to 15 per cent of the sessions in both cities, four or fewer pages were accessed, while a few sessions included 50 or more pages.

Of the three main methods of accessing the IRIS magazine, viewers were more likely to use the two methods that required their active participation. Fewer than a third of the household heads reported using 'scrolling' regularly, that is passively allowing the pages of the magazine to roll by automatically in sequence. Using the keypad number buttons to call up specific pages was the most regularly chosen method, despite the fact that this method could involve a wait of 20 or more seconds for the requested page to appear on the screen. The second most regularly practiced method was to use the GO button to make the pages appear (in sequence) more quickly.

A great degree of interaction between television viewing and use of teletext was noted. Only about one fifth of all teletext viewing sessions in both cities occurred independently of watching television. The most common practice was to turn to teletext in the midst of watching television. This was the case in almost half of all teletext viewing sessions, while the rest of the sessions either occurred immediately before or immediately after watching television.

In spite of the fact that teletext and television viewing were closely linked, teletext viewers did not seem to make regular use of teletext during the commercial breaks. When questioned, only between 10 and 20 per cent of the heads indicated doing this regularly; another quarter claimed to do it occasionally. This, of course, can partially be explained by the fact that teletext access times make it hardly worthwhile turning to teletext during the average commercial break.

In Toronto, avoiding a part of a program that was considered dull was just as common a motivation for turning to teletext as avoiding commercials. In Montreal, turning to teletext to avoid programming that seemed dull was a much more common practice than in Toronto, and was engaged in by roughly three-quarters of the Montrealers, at least occasionally. That this practice was noted more frequently in Montreal than in Toronto can partly be explained by the more limited number of French language television channels that are available to the majority of Montreal francophones when compared with the number of English language stations that are available to Toronto anglophones.

Viewed in this context, teletext would seem to be used and viewed as an alternative, or as another choice among the various choices that are available from the television set. When interest in a television program lags for one reason or another, teletext then becomes one of a number of alternatives open to viewers that can satisfy their need for diversion.

3.2.3 Who used teletext the most

In both cities the heaviest users of teletext were more likely to be males and more likely to be older (aged 55 and over). In Toronto there was a very definite link between frequency of viewing teletext and socio-economic status, with the heaviest users being more likely to have lower incomes, lower status occupations and lower levels of educational attainment. In Montreal no such pattern was observed. Instead, heavier use seemed to be related to their being more ardent newspaper readers.

The most important determinant of frequency of teletext watching was the amount of television viewing, with the heavier users of teletext also being the heavier users of television. This is not surprising, given the very close interaction between teletext viewing sessions and television viewing that was noted previously, with most teletext sessions occuring immediately before, in the midst of, or immediately after television viewing.

The characteristics of the heavier teletext users are, however, in direct contrast with the characteristics of those who are likely to become the first adopters of teletext. As noted previously, the first adopters were more likely to be younger, better educated and lighter television users. It is, however, possible to speculate that it will be the younger, the more affluent and less television-dependent people who will become the first purchasers of teletext, but these people may not, in the longer run, turn out to be its heaviest users. It may be that teletext will have to wait for its later adopters before it will reach its full potential in terms of frequency of use.

3.2.4 Technical problems using teletext

Generally, the design features of the IRIS teletext system were highly rated by the trial participants. The great majority found the written instructions that accompanied the decoder helpful. They did not have difficulty figuring out how to use the keypad and they found the teletext print easy to read. The page numbering system drew the greatest amount of criticism; roughly 30 per cent of the household heads found it confusing.

The technical aspects of the IRIS teletext system did not fare as well as the design features. Large proportions of household heads in both cities indicated experiencing the four problems asked about at least occasionally. The decoder sticking on a page and "not being able to get teletext at all" were experienced at least

occasionally by roughly 70 per cent of the household heads, and about 50 per cent of the heads found these two problems very or quite annoying. The decoder not working when it first came on was experienced by about one half in each city.

Of the four technical problems, pages being too slow in coming was by far the most frequently mentioned problem and annoyed the largest proportion of participants. Some 80 per cent in Montreal and 99 per cent in Toronto felt they had had this problem at least occasionally. Furthermore, large numbers (67 per cent in Montreal and 78 per cent in Toronto) felt this problem was either very or quite annoying.

Objective tests performed on the decoders in use during the trial suggested that users had to wait longer for their pages to appear on the screen than might have been the case if the system were functioning normally. In nearly half the households, the average access time exceeded 15 seconds. Under normal conditions, for a magazine the size of the IRIS magazine, one might have expected a maximum access time of 20 seconds, with an average of around 10 seconds. The amount of criticism that was directed towards this aspect, however, suggests that even normal IRIS access times might have been considered too long.

One of the more surprising findings in this study was that technical problems did not seem to affect the frequency of using teletext. Heavier teletext users reported having as many, indeed more, problems than light users and non-users. Technical problems

were often sporadic in nature, and those who used the system more often had a greater likelihood of encountering these problems more often. It is especially interesting to note that these problems do not seem to have deterred the more avid users from watching teletext.

While it is undoubtedly true that many persisted in using teletext in spite of technical problems, it is untenable to suppose, even in the absence of any demonstrable effects, that technical problems did not affect usage. Indeed, technical performance has to have affected response to teletext. Persistence in use in spite of the technical problems encountered speaks well for the non-technical aspects of teletext, that is, for the day-to-day needs which teletext served.

3.2.5 Use of the IRIS content

Both the English and French IRIS magazines were composed of approximately 150 pages of text and graphics, presented in nine major sections. The first four sections presented what might be called hard news, namely News, Weather, Sports and Financial News.

The latter part of the magazine presented softer material such as entertainment information, consumer news, community events schedules and general interest items. Each page of the softer sections of the magazine was updated one to three times a week, while each page in the hard information sections was updated more often, as frequently as eighteen times per week.

In Montreal, Nouvelles reached the largest number of teletext users, with some 90 per cent accessing the section at least once during the diary week. Sports, Météo and Culture/Loisirs reached the next largest number with about 65 per cent accessing each of these sections during the week.

In Toronto, Weather was the most widely accessed section of the magazine with 80 per cent of the teletext users doing so at least once during the course of the week. News and Sports followed next, reaching some 60 to 70 per cent, while other sections reached a considerably lower proportion.

The average teletext user in Montreal watched 104 pages of teletext each consisting of one to three screens of text and graphics, during the diary week. The average user in Toronto watched 56 pages.

Most of this difference in use between the two cities is accounted for by differences in the viewing of the news section. On average, only 12 pages of News were watched by Toronto users compared to 58 pages in Montreal. Other sections had roughly equal pages accessed in the two cities. In the course of the week, the average user in each city watched 10 pages of Sports, 8 to 10 pages of Weather (Météo), 7 to 8 pages of Features (Chroniques) and 6 to 7 pages of On the Town (Culture/Loisirs). Other sections had fewer pages accessed.

Part of the reason for this differing pattern in use of the news in the two cities may be found in the composition of the two magazines. The Montreal magazine consisted of an average of 163

pages, 54 of which were devoted to news. The Toronto magazine averaged 147 pages but only 12 of these, on average, were devoted to News. During the course of a week, Toronto presented almost as many pages of news as Montreal, but Toronto made a practice of updating and retiring their news stories much more frequently than Montreal. It seems that the Montreal practice of presenting a longer, even if less current, news section paid off in terms of readership.

This, however, is not the total answer as to why there was greater use of teletext in Montreal. In the June diary measurement period, the same pattern of considerably heavier use of teletext in Montreal compared to Toronto was noted. During that period both magazines presented the same number of news pages, but Montrealers read many more pages of news than did Torontonians. The pattern of heavier teletext use in Montreal was consistent through both the June and November measurement periods despite changes in the compositions of the two magazines.

3.2.6 Opinion of the IRIS content

Generally, opinions about each of the magazines' sections were positive, with news and weather sections receiving the highest praise. With the exception of the On The Town section in the Toronto magazine, a majority rated each of the sections as either "very good" or "good". Majorities also felt that the sections contained the right amount of topics, that the content had the right amount of detail, and that the material was changed often enough.

The two parallel sections concerned with arts and entertainment information, Culture/Loisirs in Montreal and On the Town in Toronto drew a fair amount of criticism. Sizeable numbers in both cities criticised these sections for having too few topics and many in Montreal said they were not updated often enough. Further questioning about the kinds of topics wanted in a future teletext service indicated a great interest in arts and entertainment, suggesting that a need was not being fully satisfied by the IRIS magazines in their field trial format.

The overall rating of the IRIS graphics was highly enthusiastic. Even when offered a trade-off between faster access times and fewer graphics or slower access time and more graphics, between one fifth and one quarter felt they would like more graphics than were presented in the IRIS magazine. The greatest number voted for no change, although there was a sizeable voice in Toronto (roughly a third) who opted for fewer graphics and faster access times.

3.2.7 Use of advertising

Advertising in the form of full page advertisements and corresponding billboards was carried in the Toronto IRIS magazine during the November diary measurement period. Corresponding billboards were banners of print located at the bottom of regular teletext pages directing viewers to specific full page advertisements.

The billboards reached much larger proportions of teletext viewers than did full page advertisements, no doubt as a result of their being located on regular pages of teletext content. Individual billboards were seen at least once during the week by between one fifth and two thirds of teletext viewers.

Each full page advertisement was viewed at least once during the week by between 10 and 26 per cent of teletext viewers. Some advertisements presented items of general interest such as recipes or quizzes while others carried only logos and advertising messages. Full page advertisements that had items of general interest seemed to draw more viewers, as did advertisements that had more heavily read pages preceeding them.

3.2.8 Difference between Toronto and Montreal

Montrealers made heavier use of teletext and were more enthusiastic than Torontonians in their reactions. Of the many reasons explored, no one reason was considered responsible for this difference.

3.2.9 The overall impression of teletext

All households heads that had had experience with teletext (the dropouts from the trial as well as the continuing participants) were asked for their impressions of teletext.

As expected, the dropouts were less enthusiastic about teletext than the continuing participants. Quite unexpected, however, was the finding that, in spite of their opinions, the dropouts reported using teletext as often as the continuing participants. Because many of the dropouts had severe technical problems, the following concentrates on the assessment of teletext made by the continuing participants.

Some 60 per cent of the continuing participants in Toronto and some 80 per cent in Montreal rated the content of the teletext services to be either "very" or "quite" interesting. Their rating of its usefulness was less positive, but still roughly one half (43 per cent in Toronto and 56 per cent in Montreal) considered it to be either "very" or "quite" useful.

In order to assess attitudes towards teletext, household heads were asked questions about the amounts they would be willing to pay, additional to the cost of a colour television set, for the package of optional equipment they received during the field trial (a converter, remote control and teletext decoder). By a process of subtracting the amount they would be willing to pay for two options (converter and remote control) from the amount they would be willing to pay for the three options, the new worth they attached to a teletext decoder was arrived at.

Although the heads were informed that when they would be making their purchase, there would be other teletext services available, and that the decoder they would be buying would function reliably and be built into their set, their responses were probably heavily influenced by their actual experiences with teletext.

Different estimates were made of the proportions who would be willing to pay varying amounts for these options. These estimates show that if the price of a teletext decoder alone can be brought down to around the $75 to $125 mark, then very large numbers (between one-third and one-half in Toronto and between one-half and three-quarters in Montreal) will feel teletext is worth the price. If the price of a teletext decoder is higher, in the range of $175 to $225, then many fewer (between 10 to 14 per cent in Toronto and between 17 to 27 per cent in Montreal) would perceive it to be worth the extra expenditure.

These figures are very revealing of attitudes and give a good indication of teletext's perceived worth. They should not, however, be interpreted as accurate predictions of future consumer behaviour. Many other forces will be at play when an actual, as opposed to a hypothetical decision, is eventually made.

3.2.10 Summary comments on audience research

A summing of all the reactions observed during the IRIS field trial can provide a good indication of the potential impact of teletext. Joining the field trial and trying out teletext meant fulfilling a number of obligations in the way of diaries and interviews. It may also have meant overcoming some initial reluctance or suspicion. That more than half of those given the opportunity to try out teletext in their homes chose to do so, speaks well for the initial attractiveness of teletext. That between two thirds and three quarters of those given the opportunity to continue with the field trial into its second phase agreed to do so, speaks well for teletext's ability to sustain interest.

That the majority of the people who had the IRIS teletext service in their homes watched it, some occasionally and some regularly, indicates that the majority found a use for it. That they continued to use the service while it was in their homes in spite of the technical problems speaks well for its staying power. Thus, the trial amply demonstrates that a teletext service can fulfill some part of the public's day-to-day requirements for information and entertainment. It would seem, therefore, that if the price of teletext decoders can be brought down, teletext will be attractive to a large number of people. As such, teletext is seen as having the potential to become another medium providing people with another source of information and diversion.

3.3 Industrial capability development

The investment in teletext by governments and by industry since 1978 has taken place in many sectors: the broadcasting industry and its suppliers, equipment manufacturers, service distributors such as the carriers and the cable companies, software houses, consulting firms, database operators, information providers, et al. All of the above sectors are well represented in Canada with the possible exception of the system providers capable of delivering turn-key systems although there are some companies which are quickly developing such a capability.

There are now three Canadian manufacturers of the related hardware and some two dozen companies producing the related software and services. One manufacturer as well as three system and sub-system houses are presently engaged in supplying goods and services for teletext; the remainder, while engaged in videotex activites, have the potential to operate in the teletext field.

Export sales of Telidon equipment and services during 1982 and 1983 were in the order of $10 to $20 million.

Since the start of the Telidon programme, government funding coupled with that of industry has contributed to the creation of some 1200 jobs, the majority of which will be permanent in nature; of these about 10% to 15% are actually engaged in teletext work.

The skills and experience developed to date spring from the original investments in WETA - Washington and TV Ontario which have served as forerunners to Project IRIS. Because the latter is a large scale implementation of Telidon technology, it has been necessary to develop a systems engineering capability for teletext within CBC. In the course of so doing, CBC worked with industry to a maximum level possible commensurate with the schedule and available funds. While at that time this industry had not reached a level of competency permitting it to undertake such a large scale job, the elements are now in place to do so.

Concerning the hardware, this encompasses the following items:

- decoders and keypads used with standard TV sets to receive the broadcast teletext service;
- encoder/inserters used in teletext control centers to insert the service on the VBI;
- audience research units to record usage of the teletext service within the base; while the units were not used in Project IRIS because of rising costs of the project, there are indications that there is a market for such devices;
- teletext control and decision centres used by broadcasters;
- page creation equipment;
- host computers;
- transmission equipment such as data bridges and data regeneration units;
- test equipment for establishing performance of transmission and delivery including cable distribution systems.

All of the above hardware, save the host computers are being or can be designed and effectively produced in Canada.

As for the software, this can be considered from two standpoints: that which is related to operating the teletext delivery system and that which is devoted to the information content. Concerning the former, the services can be identified as those relating to the operation of the host computer and the encoder/inserters. The reader is referred to Figure 2 for details in this connection.

All of the above products have a marketable value because they serve as the basis for designers in obtaining new business.

Regarding the information content in Project IRIS, this has, for the greater part, been generated internal to CBC and is labour intensive. While this may not be considered as a marketable product for export, it is nevertheless a creator of jobs and is a key element in developing a teletext industry.

4 ASSESSMENT OF THE FUTURE OF TELETEXT SERVICES

4.1 General comments

The preliminary evidence given above as to the acceptance of a teletext service by the public via the VBI, has been found to be sufficiently encouraging to CBC and DOC to warrant continuation of the service. This evidence points to the fact that it satisfies certain needs of the public not only of itself but as an adjunct to existing television and radio services. The two parties involved in Project IRIS have therefore decided to fund a continuation of the service for a period of three years and so have signed a second Memorandum of Understanding on September 17th, 1984 implementing a follow-on developmental service to operate through to March, 1987. While the former MOU specified all the funding to be provided by the Minister of Communications, the recent MOU specifies a total of funding of $12 million to be divided equally between DOC and CBC. The terms of the second MOU are essentially the same as the first but with the added proviso that CBC will endeavour to draw upon the information provider community to a greater extent than it has in the past for the generation of content.

4.2 Economics of broadcast teletext

The studies conducted to date on the economics of electronic publishing deal with teletext and videotex in combination since there are similarities in their technologies and their output. As broadcasters, it is felt, however, that there is a need to recognize a marked difference between the two in terms of both the future sources of revenue and their respective potentials. Teletext is associated directly with regular TV and radio programming and is distributed freely. It has the potential to provide captions, flashes, dealer tags by overlaying related messages on the TV picture while still providing frequently updated pages of information. On the other hand, videotex is seen as a service providing a wide range of data for which the subscriber must pay a user fee. Initially at least, videotex services are seen as serving mainly the business market and resources will derive from billings to users and possibly to some of the information providers.

Determining the revenue potential of teletext is first a matter of predicting the rate of development of the mass market that is indicated by the television set penetration in Canadian homes. The second factor affecting the medium's future commercial viability is popularity, the pattern of use that will evolve and the success of broadcast advertising in a textual form.

The rate of public acceptance of a teletext service will

also depend largely on the price of the decoders conforming to the new standards.

Decoders first became available on the North American consumer market in 1984 having a price tag in the order of $900/set, although Panasonic decoders sold with a specific TV model now cost $300 (US).

As the market expands and hardware costs diminish, the price is expected to drop dramatically so that decoders are expected to cost about $50 (US) by 1988, or about the same price as the World Standard format decoder now costs in the UK. The add-on cost for teletext capability built into the TV sets will also become insignificant and it is expected that by the early 1990's virtually every color TV set sold in North America will incorporate teletext capability.

Studies published in 1983 have, however, been overly optimistic in projecting teletext decoder penetration in North America. The rule-making adopted in April 1983 by FCC whereby a cable operator is not required to carry broadcaster-originated teletext service as well as the adoption in December 1983 of the NABTS are two factors which will influence penetration projections published to date. New studies to be published in 1985 are expected to provide more accurate predictions.

However, assuming a gradual and significant decrease in the price of decoders, CBC estimates that rapid growth in teletext

penetration in Canada will depend largely on such factors as the development of teletext services by other broadcasters, the establishment of regional and local services in addition to the national service and finally the obligation of cable systems operators to carry the VBI signal intact.

If service is available under such conditions, the number of teletext households in Canada is expected to reach two million by the mid 1990's which represents about 20% of the households. The North American market penetration is expected to reach 30% of the 120 million households by the year 2000.

The dimension of the future market for teletext advertising can be measured against the rate of renewal of television sets now in use, and the rate of penetration of the new service can be compared to the historical growth of other electronic media over the past decade. However, when it comes to estimating the advertising revenue potential of electronic publishing, there are few North American data on which to base conclusions.

In the United Kingdom, Oracle, the ITV commercial teletext service, began operations in 1981. The operators have estimated that by the end of 1983 their revenues would reach some $3,600,000; representing slightly less than $3.00 per teletext set in use. According to the latest figures available, there were 1,600,000 teletext decoders in U.K. households as of March 31, 1984, for an audience reach of 5.6 million people. Oracle reports that the number of television sets receiving teletext is growing by about 50,000 every month.

In the United States, a report prepared by Communications Studies and Planning International Inc. provides an estimate of the advertising revenue potential on a per-household basis in a manner common to the broadcast media, i.e. the number exposed to the commercial message. The estimate is $7.03 per household, a figure which is likely sufficient to ensure the viability of teletext, given the relatively low operating cost of the system.

In Canada, it is estimated that once installed at the national, regional and local levels, teletext service will generate advertising revenues ranging from $3.00 per set in the early stages of set penetration to $6.00 per set by the year 2000 in 1983 dollars. The revenue potential of the CBC broadcast teletext service is estimated at $1.8 million per year by 1990 and $24 million by the year 2000, in 1983 dollars.

Another aspect of the economics of broadcast teletext is that of the operating costs for the broadcaster. In the U.K. where as pointed out above, there is a sufficient quantity of decoders to arrive at meaningful cost data, the figures are relatively low for operating a teletext service. The operating costs for the Prestel technology have been reported at $50 per hour; this compares with BBC's costs of $200,000 per hour for a high quality drama show and

$1,000 to $2,000 per hour for radio. Clearly, the potentially strong synergistic relationship which can develop between broadcast teletext on the one hand and radio, television, and print journalism on the other makes a good case for broadcasters to implement a teletext capability.

4.3 Role of affiliated stations

Privately-owned affiliated stations (6 French and 26 English) will have a significant role to play in the overall distribution of CBC network teletext services, if the national component of these services is to reach the nearly 100% of Canadian households which CBC and its affiliates presently cover.

Affiliates of both CBC networks provide unduplicated off-air coverage to approximately 20% of Canadians. In the case of the French service this represents slightly more than 1 million Francophones and in the case of the English service just over 3 million Anglophones.

Over the last year and a half, CBC affiliated stations have been kept informed of the IRIS Project developments through National and Regional Affiliate meetings and through a Joint CBC/Affiliate Committee. These meetings have indicated a significant interest in closely monitoring progress in the implementation of a national teletext service and the future origination of teletext services at the local level.

CBC affiliates play a primary role in the provision of local teletext services to their communities as they provide the only local off-air television service. Tailored as they would be to meet the needs of individual communities, it is considered that a local teletext service would be attractive in stimulating decoder sales, and in combination with the national services of CBC, would provide Canadians in affiliate-served communities with a competitive and balanced Canadian service.

Advertising potential for teletext at the local level is rated as high once decoder saturation levels begin to escalate and could translate into an important new source of revenue for these stations.

4.4 Competition

Competition to Canadian broadcast teletext services and the supporting industry comes from two sources: penetration of the French and British alphamosaic systems (Antiope and Prestel respectively) into the US market reducing the potential for export of the related Canadian goods and services on the one hand and on the other, US broadcasters implementing the Canadian alphageometric technology (Telidon).

Broadcast teletext services based on an alphamosaic system of coding have made considerable inroads in Europe. In the UK on March 31, 1984, 1,600,000 teletext decoders were in service for an audience reach of 5.6 million people; Oracle reports that the number of television sets capable of receiving teletext is growing by about 50,000 every month. Sweden, Australia and the Netherlands also have more than 100,000 each. Both the British and the French have been actively marketing their equipment in US for several years but with little success. Taft Broadcasting now offers teletext services in Cincinnati, Ohio and in Chicago, Ill., using UK technology; Zenith which is tied into the deal sells the teletext decoders. The French, working through their marketing consortium, Videographic Systems of America, are committed to a $20 million plan to sell videotex/teletext hardware and software in the US. In both cases, there have been

numerous small trials to "try out the waters" which have preceded these initiatives. Thus, this foreign penetration with the resources behind it will provide stiff competition to the Canadian industry.

Two major TV networks, in the US, CBS and NBC, have launched national teletext services. CBS's teletext service, called Extravision, began operation in April 1983 in NABTS/NAPLPS format after the FCC authorized the broadcasting of teletext on March 31, 1983. CBS transmits about 100 pages with affiliates inserting local or regional content as they choose.

NBC launched its NABTS-format teletext service in mid-summer 1983, with the service now available over its entire network. The service is similar to its earlier teletext field trial in Los Angeles which initially used alphamosaic technology but like CBS has since converted to alphageometric format, using the encoding system developed in Canada.

In late 1983, marketing of teletext decoders in the United States was under way in earnest with the two major networks offering full services to the viewers. Sony and Panasonic, for example, have reduced the price of decoders to $300.00 (US) if the customer buys a specific top-line model television set. This marketing strategy was launched in Charlotte, North Carolina when WBTV signed on as the first CBS affiliate to offer a local and national teletext service.

WIVB in Buffalo, New York has since followed suit. Recently, CBS also launched an advertising campaign in Southern California to promote retail outlets which sell teletext decoders, following its successful display of the service in strategic locations around greater Los Angeles during the Summer Olympic Games. Such a marketing effort is not possible in Canada until a full teletext service is offered to viewers from coast to coast.

4.5 Developing service penetration

Experience abroad to date, particularly in the UK, together with the results of the audience research conducted in Project IRIS, point to the fact that broadcast teletext services will likely find broad acceptance in Canada. At present three basic factors explain this acceptance: information is available whenever the user wants it; the user has a choice of page selection; and, the service can be rendered complementary to radio and television services as well as print journalism.

The service is not restricted to deadlines. The user must not necessarily wait for the weather forecast, for the newscast at the top of the clock, or for a sports score. The weather is updated as needed as are the news items, and the scores are put in when they become available. All are available whenever the user wishes to access this information. The paragraphs which follow describe some practical considerations in this context.

At a demonstration of Project IRIS to the CBC's Advisory Committee on Agriculture and Food, members commented that Radio Noon is probably the best agriculture-oriented program on radio in North America. But farmers have a problem: the program carries a half-hour list of current commodity prices and the figures are very hard to follow. The slightest distraction will cause the listener (the farmer) to miss a key price. After all, the farmer makes his living buying and selling commodities. It was therefore suggested that a teletext service display the prices in the Resources section of the teletext magazine, thereby permitting Radio Noon to take a different approach in its programming and explain to the farmer why the market is the way it is. In other words, leave the statistical explanation, text and graphs, figures and tables to the teletext service, and the analysis of the market conditions to Radio Noon.

It is also worth noting that the prices given out by regional Radio Noon programs are repeated in 16 or so different areas - virtually the same prices are given to the audience, but not from a single source...each region researches and seeks out its own prices...a duplication of 16 times every day. A teletext service can interface with agricultural departments to get the price changes once, twice or even three times a day for transmitting across the country at the same time, thus eliminating duplication by 16 areas five days a week.

Another point deserves mention in this context. Consumer-type information heard once or even missed by some of the audience may be carried on a teletext magazine and left in the cycle for one or more days. A tremendous amount of interesting and useful information is broadcast by CBC, both Radio and TV, which is often missed by an audience wishing it had not been so. A teletext service can remedy this. Two examples illustrate the point:

- Children watch television programs such as "Mr. Dressup"; the CBC had published a book of 50 projects from that programme; a teletext magazine could carry projects from the book.
- The TV programme, Market Place, occasionally carries consumer test data provided by the Canadian Consumer Magazine; this information could be readily included in a teletext magazine.

The above practical considerations relate to experience gained with the English network. Insofar as the French network is concerned, similar examples arise whereby development and significant penetration of a teletext service can enhance its effectiveness. For example:

- network audiences have manifested their satisfaction to biographies of world leaders included in the teletext magazine on the occasion of their death or their acceptance of new responsibilities e.g. death of

Mr. Andropov and nomination of Mr. Chernenko. This information is an important supplement to radio and television;

- special documents for occasions such as Remembrance Day or the anniversary of the D-Day landings have generated interest;
- special interest groups have already looked upon a national teletext service as a billboard to make known their activities. The 'Fédération des francophones hors Québec' has manifested a strong interest in this connection.

A teletext service can cross-promote radio and television programming in that it can direct the user to a special programme being aired by either; this is important when programme changes are made too late for the last edition of the local newspaper. It only takes a few moments to update a TV schedule highlights package, or a radio highlights block to be carried by the teletext service.

In the case of CBC, it drew upon existing skills and services within its organization to develop a new service which can be made to serve and enhance existing radio and television services and not necessarily compete against them. Thus for Project IRIS, the magazine draws upon the CBC news, and the Wire Service Editing system. It takes news items prepared by the News Service and

re-formats them to suit the TV screen and enter them into the system. This applies not only to news, but financial, resources, sports, features and the like. Thus, whenever a listener or a viewer misses a newscast on radio or TV and the newspaper has not yet arrived, a teletext service can offer a condensed package of information.

5. CONCLUSION

The advent of modern digital technology with its myriad applications for developing goods and services which can benefit society has been the basis for the development of Telidon technology. Governments, industry and television broadcasters have explored the application of this technology for the development of teletext - a new communication service delivered to the home along with the standard television signal on a piggy-back basis. The standard home television receiver, when fitted with a suitable decoder, transforms the teletext service into images for viewing in the conventional manner. This decoder is currently about the size of a conventional channel selector but within a year or so, it is expected that it will be integrated into the design of the television receiver.

The evolution of events noted above was recognized by the CBC and by the federal government shortly after the development of the Telidon concepts in 1978. In 1981, the CBC and DOC signed a Memorandum of Understanding to test this technology in the broadcasting environment. This report has described the implementation of the test, the studies of the public's reaction to the trial service and the industrial capability which was put into place by so doing.

Concerning acceptance by the public, the audience research carried out in Montreal and Toronto indicates that a service offering news, weather, community events, sports, financial news and the like in both official languages holds promise. This research which was carried out in two phases indicates that more than half of those given the opportunity to try out teletext in their homes accepted the offer which speaks well for the initial attractiveness of the service. Between two thirds and three quarters of those given the opportunity to continue with the second phase accepted the offer.

Concerning the industrial development, the investment of public funds ($7.164M) has resulted in the development of a Canadian capability which can deliver the related hardware and software as well as do the related systems engineering; it is now capable of meeting the needs of the broadcast industry both at home and abroad.

Through continued efforts by the broadcasters, governments, information providers, and industry, standards have been put into place to govern the generation, transmission and reception of teletext signals. These standards, which apply to the whole of North America, now permit receiver manufacturers to freeze the design of their television receivers for sale to the public. It is expected that quantity production will reduce the price of a decoding capability from the current $300 US for experimental models to about $50 US.

As for the future, while the Canadian public has not yet been able to buy teletext decoders, there is sufficient evidence of eventual wide acceptance by the public to warrant prolonging Project IRIS fully recognizing that it will eventually grow into its own. To this end, DOC and CBC have entered into a follow-on developmental phase which will terminate in March 1987 at a cost of $12 million split evenly between the two parties. An MOU has been signed to launch this activity. The evidence from the UK and from the US supports such a decision; in other words, it is only a matter of time for the Canadian scene. Presently, viewers in Toronto have a choice of 4 teletext services: CBC (French and English), TV Ontario, CBS; NBC is presently transmitting in the VBI. Montreal viewers have 3: CBS and CBC (French and English).

During Project IRIS, much has been learned about teletext services in regard to the benefits it can bring to the Canadian public and the potential for the service eventually to sustain itself with revenue derived from commercials. However, to reach that state, there must exist a national teletext service in both official languages and there must be a large number of decoders in private homes.

C B C
CORPORATE TELETEXT PROJECT TEAM
(Responsible to Corporate Planning)

CORPORATE TELETEXT PROJECT MANAGEMENT COMMITTEE (CTMC)

CBC CONSULTANTS & ADVISORS AS REQUIRED

- Legal advisor
- Industrial Relations
- Sales Policy and Planning
- External Relations
- Finance
- Communication
- CRTC

CORPORATE DIRECTOR OF PROJECT

PROJECT COORDINATOR

D.O.C. | CORP. RESEARCH | ESD REP. | FSD REP. | CORP. MIS REP. | EHQ REP.

DOC INTERFACE

Liaison

Access to Telidon technology

Access to DOC technical expertise as required in all aspects of field trial development and operation

Access to DOC resources identified to the project

Administration of transfer of systems products that will result from CBC field trials to the industry

RESEARCH SPECIFICATIONS

Participation in determining type of information wanted and needed

Evaluation of user reaction to service

Homes to be sampled

SYSTEM TESTS

Evaluation of audience reactions to service

- Selection of sample
- Development of questionnaires
- System for monitoring usage
- System for data analysis

PROGRAM CONTENT SPECIFICATIONS

Type of information required

Users to be served (target)

Potential Public Info. Providers

Volume of info. vs time response

Page design and creation

Menu and information structure

SYSTEM TESTS

Coordination of info. Provider training

Participation in evaluation of user reaction to service

COMPUTER PROGRAM SUPPORT

Data Processing Specifications and Parameters

Technical Liaison with DOC

Evaluation of impacts if teletext system technology is used for internal CBC operation

Assistance in technical design of field test

SYSTEM TESTS

Provision of computer access and peripherals for data bank generation and storage

Provision of communication from data bank to transmission facilities

Provision of software system support

Monitoring performance of data processing

PROGRAM DELIVERY

Transmission/reception technology specifications and parameters

Technical liaison with DOC

Evaluation of impacts if teletext system technology is used for internal CBC operation

Assistance in technical design of field test

SYSTEM TESTS

Provision and installation of transmission facilities

Evaluation of system technical performance

TELETEXT FIELD TRIALS OPERATION

MONTREAL TELETEXT CENTRE SUPERVISOR

Teletext Centre Agents

Clerk (steno-typist)

TORONTO TELETEXT CENTRE SUPERVISOR

Teletext Centre Agents

Clerk (steno-typist)

CALGARY TELETEXT CENTRE SUPERVISOR

Teletext Centre Agents

PROJECT DEVELOPMENT IMPLEMENTATION AND SYSTEM TESTS SUPPORT PERSONNEL

- Engineering
- Technical services including decoder installations into homes
- Computer support
- Audience research
- Audience relations
- Information Provider Relation
- External Relations - CVCC, DOC, Vispac, etc.
- Accounting
- DOC Technology experts
- Internal/External Communications

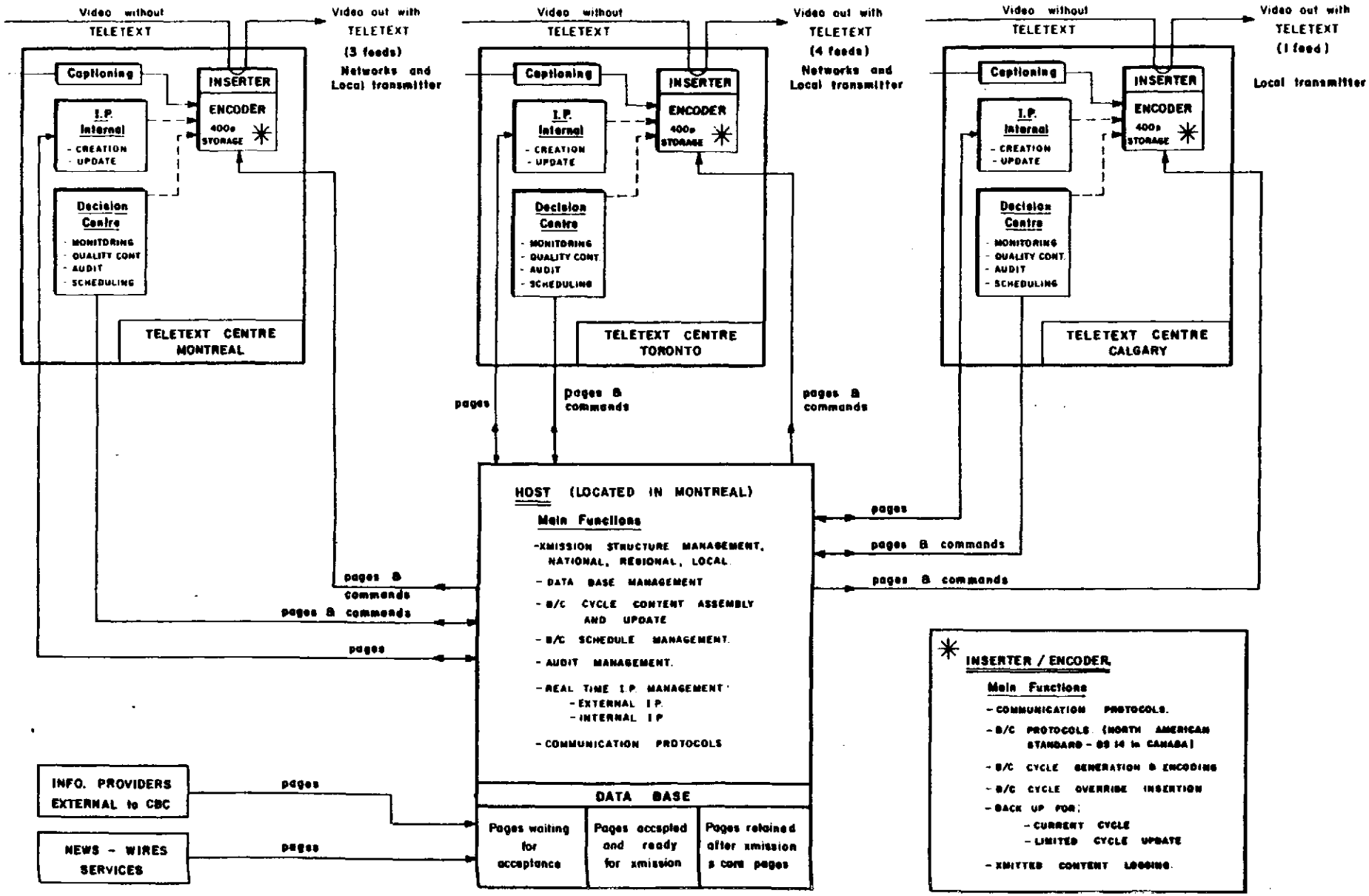
ORGANIZATION OF CBC MANAGEMENT TEAM FOR PROJECT IRIS

LEGEND

ESD	= English Service Division
FSD	= French Service Division
DOC	= Dept of Communications
MIS	= Management Info Systems
EHQ	= Engineering Headquarters
VISPAC	= Videotex Information Service Providers Association of Canada
CRTC	= Canadian Radio-televisinn and Telecommunications Commission

Figure 1

PROJECT IRIS TELETEXT SYSTEM ARCHITECTURE



CBC PROJECT IRIS FIELD TRIALS SYSTEMS DEVELOPMENT AND COMPONENTS ACQUISITION COST

INDUSTRY PARTICIPANTS	SYSTEMS DEVELOPMENT	COMPONENTS ACQUISITION	TOTAL COST
Norpak Limited	$ 196,000	$ 1,629,000	$ 1,825,000
Digital Equipment of Canada Limited	97,000	203,000	300,000
The Genesys Group	22,000	151,000	173,000
Société de téléinformatique RTC (STRTC) Inc.	61,000	81,000	142,000
Signatel Limited		78,000	78,000
Systemhouse Limited	77,000		77,000
Analytech Components Inc.		63,000	63,000
A.E.S. Data Limited		37,000	37,000
Lanpar Limited		27,000	27,000
Electrohome Limited		18,000	18,000
Kusint Electronics & Sales Canada Ltd.		18,000	18,000
Louis Albert Associates Inc.		16,000	16,000
Solutech Informatique Inc.		10,000	10,000
Broadcast Video Systems Corp.		9,000	9,000
R.C.A. Inc.		8,000	8,000
Gandalf Data Limited		6,000	6,000
Various		49,000	49,000
TOTAL:	$ 453,000	$ 2,403,000	$ 2,856,000

Figure 3

LIST OF PARTICIPATING ADVERTISERS IN PROJECT IRIS
FIELD TRIALS (1983) (TORONTO)

AGENCIES	COMMERCIALS
FOSTER:	. Schneider's recipes . General Motors 10.9% financing . Ont. Govt. Ministry of Tourism . Camco appliances . Air Canada travel packages
MACLAREN:	. Imperial Oil (ESSO) . Mutual Life . General Motors (Trivia Challenge) . CN Marine . Molson
SAFFER, CRAVIT & FREEDMAN:	. Firestone . Fairweather . Home Hardware . Big Steel Man . Basking Robbins
J. WALTER THOMPSON:	. Purina
INDEPENDENT AGENT:	. Continental Bank of Canada (Andrew Owens)
HUDSON BAY:	. Hudson Bay store (retail items - own creation)

NOTE: 18 regular clients supplied a variety of commercials in the following forms:

- stand-alone billboard (2 line commercial)
- billboard form, referring to a full-page commercial
- Stand-alone full-page commercial

Figure 4