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REPORT ON DEVELOPMENTAL ACTIVITY UNDERTAKEN TO SUPPORT INTER-AGENCY EXPLORATION OF TELIDON IN EDUCATION

Volume I

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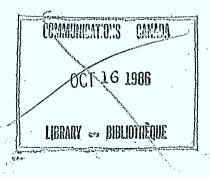
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Submitted to the Department of Communications by the Ontario Educational Communications Authority, March 31, 1980

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TABLE OF CONTENTS

OECA Report on Developmental Activity Undertaken to Support Inter-Agency Exploration of Telidon in Education

Introduction

- 1. Objectives, Developmental Activity
 - Introducing the Telidon concept to educational and public information agencies
 - Demonstrating educational potential of the technology
 - Organizing participation of interested agencies
 - Channelling resultant feedback information on technological system requirements to Dept. of Communications 16
 - Supporting the Dept. of Communication's promotion of Telidon applications outside of Ontario
 19

1

5

7

12

- Providing orientation workshops and facilitating inter-agency communication
 22
- Modelling presentational and conceptual variants of educational applications of Telidon

2. The Range of Support Tasks Required

	 Promotional Meetings Demonstrations Print materials Workshops Consultation Production 	26 28 31 33 38 41
3.	Quantitative/Qualitative Description of Liaison Activities	
	 Number of meetings held, persons contacted Range of agencies and representatives contacted Focus of communications 	45 47
4.	Assessment of Inter-Agency Participation	
	 Level of interest in the project Extent of commitment of agencies contacted Contraindications noted 	55 56 57
5.	Inferences re Data Base Opportunities	58
	 Type of content proposed by participants Contraindications re accessing of non-Telidon data bases 	
6.	Data Base Models	73
	 Graphics and aesthetic presentation Page sequencing Information vs involvement 	

7.	Summary and Recommendations	77
8.	Annexes No. 1: Telidon Style Manual No. 2: Report on Use Reaction	91 94
9.	Appendices: Volume II	101

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INTRODUCTION

The Ontario Educational Communications Authority (OECA) is a Crown Corporation in the Province of Ontario. Its policies and directions are determined by a 13-member Board of Directors appointed by the Lieutenant-Governor-In-Council.

Its objects, as spelled out in establishing legislation are:

- to acquire, produce and distribute programs and materials in the educational broadcasting and communications fields.
- to engage in research in those fields of activity.

The mandate is interpreted to provide educational opportunities to all residents of Ontario regardless of age, level of educational attainment or location within or outside conventional educational institutions, using communications technologies that are educationally effective and economically reasonable.

Several years ago, representatives of the OECA management group undertook to acquaint themselves with recent developments in the use of the vertical blanking interval for displaying textual information, this technology being perceived to offer opportunities for the extension of educational broadcasting services already supplied by TVOntario, the OECA's television network. Both the Antiope and Oracle systems were given close scrutiny, and enough was learned to warrant further exploration. It was noted, however, that existing systems offered relatively little graphic capability, and the applicability of the technology to a wide range of educational and instructional objectives was in question.

When, in 1978, the OECA was afforded an opportunity to examine the capabilities of Telidon, the videotex technology developed by the Department of Communications, the superiority of its graphics and its suitability for carriage in a variety of transmission modes led to the conclusion that the potential for educational applications was great, and that developmental activity should be undertaken in order to lay a foundation for a field trial, that would assess the operational effectiveness of the technology. Proposals were therefore made to the Department of Communications, directed to both developmental and operational objectives, based upon the assumption of joint support of the activities associated with these objectives.

It was the perception of the OECA that the developmental activities reviewed in this Report were to be of a high order of magnitude and importance, calling for the investment of a great deal of time on many levels--organizational, promotional, administrative, supportive, operational--and considerable resources, technical and technological.

Contact had to be made with hundreds of schools, colleges, universities, public libraries, and their parent organizations. Sources of potential data base information had to be identified, whether inside the educational community or outside. Follow-up liaison had to be conducted. Demonstrations of the technology had to be given. Literature had to be prepared and distributed. Production workshops had to be presented. Model applications had to be prepared. Logistics had to be addressed.

The experiences of the past year have demonstrated that the OECA's perception of the magnitude of the task was an underestimation. The level of activity required of the project team was extraordinary, the demands almost endless. In large part, this can be attributed to the very high level of interest encountered among those approached by the project team and those who approached the OECA on their own initiative. In part, it can be attributed to the dimensions of the over-all task undertaken, the involvement of so many agencies on the consortium model. In a contradictory sort of way, as will be illustrated in the body of this Report, the early shortage of material resources needed to conduct demonstrations and to enable production of data base materials to proceed, acted as a limiting factor that enabled the small project team to survive the demands made upon it. The negative aspect of that shortage was the magnifying of the inertia associated with the long breaking-in process required by participants who knew nothing about page design, page sequencing, or the skills required for operation of page creation terminals.

Other factors impinged upon the evolution of the project. The development of interactive (telephone) Telidon before other modes of carriage led to a promotion of Telidon as "two-way television" by the Department of Communications and the common carriers. This inadvertent emphasis on Telidon via the telephone created an impression that only this form of Telidon was of use and interest to the user. The subsequent delay in the development of the broadcast mode (teletext) of Telidon made it difficult for us to demonstrate and even to explain how certain information might be better suited for teletext. This then set the stage for developmental activity during the fiscal year 1979-80.

The work, although demanding, has presented an interesting challenge, and has led to inferences which should prove of some worth in shaping future decisions bearing upon other explorations of Telidon applications, and upon the optimal implementation of Telidon systems.

OECA Report on Developmental Activity Undertaken to Support Inter-Agency Exploration of Telidon in Education

1. Objectives, Developmental Activity

The content of this section of the Report consists of, in order, a brief elaboration of each objective, and a summary account of the steps taken to fulfil that objective.

1.1 Introducing the Telidon concept to educational and public information agencies.

Far from being just an OECA enterprise, the developmental project to which this Report refers is a complex of interrelated activities in which scores of agencies and institutions participate and in which hundreds have expressed an interest. It was necessary to raise awareness of both the technology involved and the opportunities presented for participation, -- potentially among thousands of schools, colleges, universities, and other agencies.

Retrospective:

Inherent in the newness of Telidon is the process of introducing,

demonstrating, explaining and philosophizing about the technology. This on-going process began with the OECA Telidon and Education project team itself. Due to a delay at the Norpak/DOC end, OECA was somewhat late in acquiring its first user terminal (August 1979). Once however the terminal was installed at OECA (2180 Yonge St., Toronto) the process of introducing the Telidon concept became both easier and more frenetic.

The first and, in some aspects, the most important area where the introduction of Telidon began was within the OECA itself. A small project team of three initially could not possibly have begun working without the contribution of other parts of OECA (areas such as engineering, technical assistance, computers, production, graphics, research and the executive). To explain the objectives of the project, about the technology and how the various areas of OECA expertise could contribute to the furthering of Telidon development provided practise for the team and put at their disposal an already well-developed system of OECA contacts in the educational area and provincial government ministries.

The OECA plan to alert those in the field of education and public agencies entailed meetings with senior educators and civil servants to discuss the new technology, viewing of

Telidon once the terminal was in place, taking part in conferences and seminars in related areas and also using the TVOntario resources to spread information. In this latter instance, the TVO utilization and corporate areas were helpful in that during the course of meetings with various contacts Telidon was mentioned and follow-up meetings arranged.

1.2 Demonstrating the educational potential of the technology.

Although videotex systems have been under development for some years in some European countries, they have been offered to the public primarily as information service facilities without explicit focus on educational applications. The focus of the Telidon and Education project is explicitly on education, yet there had been, up until 1979, very little opportunity to display Telidon's potential in this field. It was necessary to conceptualize various educational applications, to give them concrete form, and to present them to interested parties.

Retrospective:

Last March the demonstration data bank at CRC had no OECA material and educational sequences were limited. As a consequence the educational potential of Telidon was

discussed in hypothetical terms and until a user terminal was available the process was indeed an academic exercise. Nevertheless, the ability to expound upon the potential educational applications of the new technology, to demonstrate Telidon effectiveness without even seeing Telidon became a challenge and was refined into an art! OECA participation in a metropolitan-Toronto-community college-sponsored conference in May 1979 dealing with computers and new technologies flooded us with requests for more information, and many phone calls to join in our field trial. Follow-through would have been more immediate had we been able to show them Telidon as well as explaining it! In retrospect, discussion of the possibilities for computer-assisted-learning (CAL), computer managed learning (CML), distance learning, aids for the handicapped, basic adult literacy support, remedial learning techniques without seeing Telidon may have unintentionally whetted appetites and made more dramatic the opportunity to view it when it became available to us.

The acquisition of an IPS terminal in July 1979 gave us a greater ability to demonstrate the possible educational applications of Telidon. Prior to that we had put information into the first Bell/Vista(Prestel) trial and had gained experience in knowing from a pedagogical point of view what could be done and what could not. The confined graphics

capability of the Vista system made us appreciate what could be done with Telidon; on the other hand, the ability of the Vista system to go outside the tree structure and do the mortgage calculation program for example, alerted us to the deficiencies of Telidon in that regard.

Sample material was created by us to show some potential educational applications of videotex. This was done initially on the Vista/Prestel system. Sequences on how to use decimals, listings of computer terms and driver training provided the first examples: Albeit simple, the material proved effective for demonstration purposes.

When visitors were able to see Telidon itself the relevance of graphics in the field of education became apparent. Of particular interest was the sequence on the prime ministers of Canada since the digitized images presented in shades of grey led most to believe that it was a relatively simple matter to put photographs on the system. They could see the use of this in areas such as history and politics.

Demonstrating the educational potential of Telidon was also done by showing how graphics are created. In some instances, being able to control the order in which objects appear on the screen acted as a catalyst to perceiving the use of the technology to teach remedial courses and to transmit information to those with poor basic learning skills.

The installation of broadcast Telidon in OECA master control in January 1980 at last gave us the ability to demonstrate teletext technology. Long-distance charges had been a major concern since terminals began to be deployed and indeed, to a large extent influenced the choice of terminal locations. Considering our limited funds we had no choice but to subsidize each terminal's long distance charge for a limited number of hours per month, any cost above that being the responsibility of the user. This, coupled with the frustration of users being unable to get a line to the host computer, resulted in minimal use of some terminals. Many users said they would wait for broadcast Telidon because it was reliable and unrestrictive and could show as well as the interactive form how Telidon might be an educationally effective aid. Emphatically, the birth of broadcast Telidon has caused a renewed interest in the capability and potential of the technology.

Prior to the advent of broadcast Telidon the lack of promotion of the potential of this means of carriage made it difficult for OECA to explain how this form of delivery might in several instances be of greater application in the field of education than the interactive form. The

inadvertent emphasis on Telidon via telephone and the description as "two way television" proved deceptive to those who knew little about the technology. They concluded that broadcast Telidon must be "one way" in the same manner that some cable companies carry a rolling format of news, weather, sports etc. It took and is still taking a major effort on our part to show people that material via broadcast is <u>selected</u> in the same fashion as via telephone, that one choses what one wishes to have, that the difference between the two modes lies in the <u>size</u> of the available data bank.

Demonstrating the educational applications of teletext must be preceded by an introduction and explanation of that particular mode of carriage. An example of the misconceptions of broadcast Telidon that have risen is illustrated by the person who, having seen the OECA sequence "Tag the Flag" via the interactive mode, was surprised to discover that the same material could be sent via broadcast. He admitted that what he had read and heard about Telidon led him to believe that only text, <u>not graphics</u>, could be transmitted on teletext. Once this preconception was addressed he immediately saw the educational benefit of such a service, piggybacked on a broadcast signal, transmitted to isolated areas.

11 -

In sum, OECA showed many educators, administrators and civil servants what some of the educational applications of Telidon might be. These included: a cost-effective alternative to conventional printing and distribution of materials, electronic publication, information retrieval, computer assisted learning, computer managed learning and messaging among schools, students and teachers. The ramifications of such a technology engendered excitment linked to the perception that many forms of education could become independent of time and place -- not only in relation to the provision of educational material, but also in terms of providing individualized learning opportunities.

1.3 Organizing the participation of interested agencies.

This sector of the project involved attendance at meetings large and small, discussion of the basis of participation, and articulation of principles of agreement that could be used to formalize commitments to the project.

Retrospective:

One aspect of the establishment of the OECA Telidon and Education field trial is the encouragement of other educational institutions within Ontario to join in the

testing of this new technology for educational purposes. Flowing from this, the building of a data bank containing educational material ranging from that which is related to curriculum to that which is generally informative is another objective of our field trial. It was envisaged that the formation of educational consortia would contribute to all aspects of the trial and, in particular, build the data bank.

The OECA's arms length relationship to the Ontario provincial government, extensive contacts with teachers and educators, a history of co-operation with the private sector and an ability to interact with agencies and sister institutions in other provinces all contributed to the process of organizing a consortium of information providers and field trial participants.

On the premise that we would make available the TVOntario network and our expertise to interested parties, we initiated a series of meetings with large and small institutions, issuing to them an invitation and a challenge to test their materials and ideas concerning the Telidon technology. Our first approach was to large, comprehensive educational bodies since we felt that they would be receptive to testing this new technology and also have the resources to commit to the trial. Among the first to be contacted were the Ontario Institute for Studies in Education (OISE), which had developed an

extensive computer-assisted learning program; Ryerson Polytechnical Institute, which had extensive resource potential (journalism, radio/TV arts, graphics), other universities; community colleges; and the Canadian Association for Adult Education.

As the largest institution of its kind in Canada, OECA was in a position to invite the collaboration and participation of smaller institutions who might otherwise have been unable to mount or to participate in Telidon trials themselves. Boards of education, individual schools at elementary and senior levels, groups of teachers, and public service organizations come under this category. With OECA resources and encouragement these smaller entities were given the opportunity to experiment with the latest technology.

In several instances we found that besides organizing the participation of interested parties we were in a position to coordinate efforts. For example, the Canadian Association for Adult Education is interested in raising the basic adult literacy level but recognizing the shortcomings of formalized classes at an institution saw an immediate application for Telidon to provide information in a personalized, less formal manner. Albert Campbell library in Scarborough has many new Canadians in its area and is interested in raising their ability to seek out information. A third institution,

Centennial College of Applied Arts and Technology in Scarborough, has the experience of developing courses to improve basic adult literacy. By informing each of the organizations of the others' interest we were able to promote cooperation among this group in relation to basic adult literacy.

Organizing the participation of other agencies in our field trial has also taken the form of providing and training freelancers to work with the institutions to prepare their material. Our initial approach to building the data bank was to encourage the educational agencies to work with the system and input their own material. Due to scarce resources of personnel and delays in receiving the IPS units (one arrived in July, the other in December) it became impractical for everyone to do this. Then, too, those information providers outside Toronto found traveling to OECA to input material most difficult. An alternative was to train a group of freelancers on the system and to have them input material. In some cases, meetings of educational agencies and potential freelancers were arranged with the result that the agency hired the freelancer to input their material. Participation in the field trial was doubly encouraged in this fashion.

Concurrently with organizing the participation of interested parties in the field trial, the project team devoted considerable attention to identifying providers of information for the teletext service. Although interest was sparked, the non-existence of a broadcast mode proved to be a large obstacle. Again, it was difficult for these people to conceive how teletext might better serve their purposes when all they were hearing and seeing pointed to the interactive forum. Now that broadcast Telidon does exist efforts can be renewed to interest these agencies in participating in the trial. More detailed information on this subject may be found in section 4.

1.4 Channelling resultant feedback information on technological system requirements to the Department of Communications.

Because the project involved previously untried applications of a new technology, very little could be taken for granted about the optimal configurations of system components for the purposes intended. One of the objectives therefore was to draw conclusions about computer software, system hardware, interfaces, and data base organization, and to relay these perceptions to the developers of the system.

Retrospective:

Through meetings and discussions with various educational institutions it became apparent that, when looked upon from the point of view of educational applications, Telidon in its Mark I form fell short of expectations. These shortcomings were both perceived inadequacies based upon raised expectations and those founded upon the technology. The alteration of the technology to accommodate applications in the field of education was in our view an important concern. Accordingly, we reported to the Department of Communications the need for changes in the keypad (see Appendix 5), the IPS software and hardware (see Appendix 5), modification and clarification of teletext-related hardware and software (see Appendix 5).

Other sugguestions that we put before DOC included a test of Telidon in the teletext mode carried via direct broadcast satellite (ANIK B) to ascertain whether or not any technological changes were needed. Inherent in the placing of dual capacity Telidon decoders (decoders able to receive data either via the broadcast signal or telephone lines) in isolated, northern areas where we are presently involved in the ANIK B direct broadcast satellite experiment is the need for confidence that such transmission is possible and

reliable (on 6 March 1980 a test as described was successfully carried out). On another front, meetings with other television broadcasters confirmed our opinion that Telidon could be a valuable production tool for educational television programs if one could feed the Telidon data directly for video display rather than having to focus a television camera on a Telidon image.

Several of the educational institutions with whom we had contact viewed Telidon in the context of their own expertise and experience and consequently recommended certain technological changes. For example, OISE having developed an extensive computer-assisted learning (CAL) system immediately saw the limitations of using a numeric keypad. They felt that until there were keyboards attached and CAL software available, Telidon could not provide the necessary degree of interaction to permit effective student use of Telidon for CAL instruction. Likewise, George Brown Community College in Toronto felt that the Telidon software and keypad presently used provided an insurmountable barrier to computer-managed learning (CML). The George Brown CML system has achieved wide recognition for its elegance. While they saw that Telidon in a future configuration might be used for such an application they counselled that a keyboard and more sophisticated software would be a prerequisite for this use.

The necessity of having a keyboard attached to the user terminal and improved software to permit more interaction were comments voiced by many. Also criticized was the tree structure and the absence of means to access material on a random word search basis. This could be accommodated by changes in the software. Other information from our various contacts that was fed back to the DOC included the need for less costly line transmission (e.g. data pac), down-line loading into regional computers to reduce line occupancy and long-distance costs, and acoustic couplers to facilitate mobility of the terminal. These perceptions were channelled to the DOC in the form of letters or items raised during meetings.

1.5 Supporting the Department of Communication's promotion of Telidon applications outside Ontario.

The needs of the project for appropriate data base content and for a clearer understanding of system configurations coincided with the interest of the Department of Communications in facilitating Telidon applications outside Ontario. The OECA undertook to support the DOC's activities in related areas.

Retrospective:

Since the OECA Telidon field trial will be in place and opening before most others and since it is unique in considering the

potential of the technology in the area of education we have been called upon and have ourselves taken the initiative in . promoting specific applications of Telidon both nationally and internationally. In Canada we have had discussions with our sister agencies the Alberta Educational Communications Corporation (ACCESS) and the Quebec Radio-Television office (Radio-Quebec) both of whom were interested in exploring Telidon technology as an adjunct in the field of educational broadcasting. Enquiries have been received from BC Tel, Alberta Government Telephones, Sask Tel, Manitoba Tel and New Brunswick Tel concerning the establishment of our field trial, advice on how to create material, and the possibility of visiting the various provinces to encourage local educational institutions to examine the Telidon system and devise material for testing in the trials. Many conferences and seminars across Canada have been attended by members of the Telidon and Education team to expound upon the field trial and the perceived value of Telidon in the educational) On behalf of the Department setting. (See Appendix 3 of Communications we have hosted meetings such as the EIA, subcommittee on teletext and discussions with the Alternate Media Centre of New York University and received many foreign delegations interested in seeing and learning about Telidon. As well support was provided to the DOC in the unveiling of the teletext mode at the Society of Motion Picture and Television Engineers meeting in Toronto.

Internationally, OECA rendered support for Telidon presentations in Australia, England and the United States. While attending conferences in Sydney and Canberra the OECA representative was called upon by educators, government officials, broadcasters and parents to explain the applications of Telidon in the field of education. Potential use of the technology in distance learning, multilingual subtitling and as a service for the handicapped were outlined. As well, a linking of Telidon to a telephone, radio or television service via satellite to the outback raised interest not only in Telidon but acted to reinforce the potential for satellite service. In London, a paper is scheduled for the Viewdata 80 Conference outlining OECA's work in the area of educational uses and teletext application. Our attendance at a conference at the Aspen Institute and the National Association of Educational Broadcasters' convention in Chicago drew attention once again to the educational uses of Telidon and, in particular, how such a technology could augment educational broadcasting. Meetings with the Alternate Media Centre and WETA in New York and Washington, D.C. respectively clarified misconceptions about Telidon and the state of the art.

Letters, phone calls and visits from other provinces and many countries asking for information on Tel1don and the OECA field trial are indications that people outside of Ontario are increasingly becoming aware of Telidon.

1.6 Providing orientation workshops and facilitating inter-agency communication

Liaison requirements of the project were not confined to initial approaches to potential participants. Followthrough was needed, in the form of intensive sessions dealing with design and production of data base materials, and the channelling of information about what various participants were undertaking. The OECA undertook the role of facilitator.

Retrospective:

Orientation workshops of two different kinds were given. One sort aimed at helping the educator who has an idea for an educational sequence present and develop that idea into the best Telidon format possible. Training on the IPS itself may be the next stage. Once the educator has actually worked on the IPS there is a better understanding of why his material was presented and formatted in a particular way. The other type of workshop focuses on the applications of the technology. Experience has shown us that some users are intrigued with the technology itself to such an extent that it becomes difficult for them to appreciate what sorts of material are appropriate, and what purpose the system could best serve. In such cases we attempt to demystify the technology and to emphasize that the content of the data bank and the subsequent applications are very important. We have found that once we make some suggestions this obstacle is removed, permitting the user/ information provider to carry on with their own plans.

It has occasionally happened that more than one person has had the same idea for a program sequence. In such instances we inform the sequence developer that the idea has been developed already in which case he may wish to try another approach or contact the initial author with a suggestion for collaboration. We have found too that there is great curiosity on the part of information providers as to what has already been done. In an attempt to provide as much information as possible in this regard we have printed alphabetical listings of what is in the data bank and kept all informed as to what is happening by means of a newsletter, Telidon and Education Update, (see Appendix 1). On many occasions we have put various people interested in the same area in contact with each other to further their interests.

An unofficial Telidon network has established itself and facilitates the needs of many in acquiring as much information as possible about the entire Telidon scene. For example, we received a phone call from a gentleman at the University of Montreal. He had been given a large NRC grant to aid in the industrial applications of Telidon and other new technologies

but he was completely unaware of what work was being done in this area. It took more than an hour to give him the names of people with whom he should be in contact. He hopes that as a part of this Telidon network he will be able to further the objectives of the field trial in his research.

1.7 Modelling presentational and conceptual variants of educational applications of Telidon.

Before participating agencies can address the design and production of data base materials, it is necessary for them to have some conception of the presentational possibilities inherent in the medium, and of functional approaches to the organization of data base content. It is therefore necessary for the OECA to model various applications, and this entails an extensive process of production by the project team itself.

Retrospective:

Given the resources available within OECA and the amount of work that must be done in order to establish and maintain the teletext and interactive field trials it was our objective to establish data banks that include examples of the different types of educational applications that would be on Telidon when such a service is operational. To this end but realizing that we are now at the <u>beginning</u> of our task our immediate concern has been to foster ideas on what should be in the data bank of an educationallyoriented Telidon service. Consequently, we have been developing educational sequences ourselves to prompt potential information providers to elaborate on what conceptual variants of educational applications of Telidon may be possible. Also our educational sequences are designed to act as a model for information providers concerning format, presentation, animation, colours, graphics, text etc. (See section 6).

2. The Range of Support Tasks Required

2.1 Promotional Meetings

The Telidon and Education project presented an unusual opportunity to educational and public service agencies to explore the potential of a promising Canadian information technology as freely-associated participants, each making an investment of time and expertise in return for access to requisite facilities. The task of spreading awareness of this opportunity was made easier by virtue of the amount of publicity that Telidon had received in the media. Accordingly, while the project team made overtures to a number of universities, colleges, and other agencies, it also found itself very soon in the position of being invited to conferences on the computer in education, and from these the word spread to many levels. Such conferences appeared to grow most vigorously in the environment of colleges of applied arts and technology -- e.g. Seneca, Algonquin, Sheridan -- perhaps because of the focus on technology at that level, but the theme appears to be surfacing with increasing frequency in the schools and universities.

Project team members have responded to invitations from these sources, and have also familiarized the OECA's Utilization Section with the project so that awareness can be spread incidentally to their other activities.

The Ministry of Education itself convened a conference on the theme for the benefit of their internal personnel, and the Telidon project team was invited to make a presentation. In the case of the Ontario Teachers' Federation, the convergence of interests in Telidon was exemplified by the fact that a letter from the OECA inviting interest in the project coincided with a letter from the OTF secretariat inviting the OECA's participation in an exploration of the new technologies in education.

A similar broad-stroke approach was taken to public libraries, the project team responding to expressions of interest in their attendance at meetings of the Canadian Library Association and the Ontario Library Association. These initals contacts led to other meetings. Contact with Adult Education agencies was initiated by the project team, resulting in expressions of interest which have, however, thus far not found particular expression.

To sum up, one of the first and most basic tasks of the project team was to establish contact with "umbrella" agencies representative of various levels of education and information service, and to respond to comprehensive meetings convened within the membership of these umbrella organizations. From these contacts, a large number of meetings with individuals or with groups representing particular schools, colleges, libraries, universities, and other agencies, spun off. Most of the spin-off meetings tended to be convened at the headquarters of the project team, and were combined with demonstrations.

2.2 Demonstrations

Even where the level of awareness of communications technologies was high, direct knowledge of Telidon was limited. For the generality of those with whom initial contact was made, Telidon, especially the page creation aspect, was rather a mystery. It was necessary to give demonstrations of the user terminal both by entertaining visits at the project centre and by transporting a demonstration unit to wherever potential field trial participants had scheduled meetings. As indicated elsewhere, logistical problems surfaced. It proved extremely awkward to arrange for the installation of a modem outside the project headquarters at relatively short notice. It was some time before acoustic couplers could be tested, acquired, and put into play as a means of achieving the necessary mobility. Even at the project site, when in due course a user terminal was installed, the need manifested itself for ad hoc relocation of the terminal within the building in order to permit demonstrations to large groups. The mobility problem was solved well on into the year, but only with some difficulty.

The majority of demonstrations, of both user terminal and page creation terminal, were given to small groups at the project centre. This was convenient and effective, but the sheer number of demonstrations, and the time consumed as a result of the marked interest displayed by visitors, meant that the page creation terminal was often not available for page production. (It had been intended that a second page creation terminal would be made available by the late spring of 1979, but the transfer was not made until six months later.)

Although a great deal of time was required to give demonstrations, it was our judgment that potential participants in the field trial could not understand the nature of their involvement without a close scrutiny of

page display, page sequencing, hardware configuration, and procedures for designing and entering pages on the 1PS unit.

During the past year countless visitors have passed through the OECA Telidon headquarters to view both the user terminal and the IPS terminal. Although the user terminal focused discussion in the overall use and potential of the Telidon technology, the demonstrations of the 1PS creation unit almost invariably intrigued and stimulated conversation. Often discussion ranged over the relationship of Telidon to the exploding new field of microcomputers; the technical and software designs that make Telidon unique; and the varied applications of the Telidon technology to the visitor's particular field of interest. (On this point, it may be worth stating that given prior notice of a visitor's specialty - sample pages were created to illustrate a relevant application. The time invested in this way often proved productive in illustrating, in visible form, how Telidon could be utilized to meet the needs of the visitor's institution/occupation).

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2.3 Print Materials

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Both the awareness phase and the demonstration phase created demands for follow-up on paper. One of the first pieces of literature generated by the project team was a general description of the project and its objectives, suitable for first-level acquaintance with the educational applications being considered. A copy was made available to visitors, and to many people who phoned or wrote to inquire about the project. Hundreds of copies went out in the first few months, and the demand continues. Various individuals and agencies expressed an interest in being kept informed of the progress of the project, and the project team responded by issuing the Telidon and Education Update in July and again in February. It should be added that, especially at the beginning of the project, there was a great demand for knowledge of Telidon itself, a demand that was met in large part via the distribution of hundreds of copies of the issue of the DOC publication In Search dealing with the topic.

As the demonstration process got under way, it very soon became apparent that potential participants had need of many support documents to help them focus on the process of data base creation and on the particulars of the commitment that they would need to undertake as project members. After some experimentation, and with the involvement of OECA's graphic design unit, a grid was evolved, displaying in light grey outline the lay-out of 40 characters and 20 lines that forms the basis of textual display on the Telidon screen. Five thousand copies were printed, and samples were distributed to those considering the design of page sequences for the data base. At the same time these were distributed, another form was given out, this one for the purpose of describing the particulars of a proposed page sequence, a completed copy to be returned to the project centre so that the records could be kept of the emerging shape of the data base.

In order to clarify the terms on which agencies would participate in the project, a document was evolved setting out proposed principles of agreement. This was frequently distributed on the occasion of the demonstration, for purposes of familiarization, but it was also issued at the time a more formal exchange of letters of agreement took place. 32.

At a later stage, as user terminals were made available to the OECA and were deployed among participants, additional paper became necessary, and a number of documents were sent out for the purpose of clarifying installation procedures and operating procedures.

2.4 Workshops

One premise on which the Telidon and Education project began, was that it would be beyond the resources of the OECA and outside the terms of reference of the enterprise for the project team to design and enter page sequences on behalf of other consortium members. The assumption was made that participants would have access to page creation terminals, and would require from the project team an introduction to the production process. Accordingly, workshops and work sessions were conducted for participating agencies.

It should occasion no surprise that some "apprentices" found the mastery of procedures and skills more difficult than did some others. Training sessions consumed a considerable amount of time; moreover, some of the most interested participants, after putting in a full working day, had to travel to the OECA from points far distant from

the project centre. For some, it proved impossible to enter pages on the terminal, and the project team was obliged by the circumstances to do this work.

Chronically, the long term objective of creating a pool of self sufficient information providers (who would assume full responsibility for creating their own material to supply to OECA as the carrier, with occasional assistance and support provided by the Authority in the planning stages) often produced in the short term a situation where production of content for the data base was delayed because of the training demands placed on the - lone - 1PS unit. The arrival of a second 1PS unit in the middle of January has alleviated this conflict to a certain degree as production can continue on one unit while training is in process on the second.

Although the operation of the IPS unit can be explained within a half-hour demonstration, the length of time required by individuals to learn the complexities of the system varies greatly, depending on their aptitude for mastering the technology. A few rare individuals can become fairly proficient on the unit with only an hour's experience (accompanied by close supervision/advice from OECA staff). On an average, most people require at

least half a day's training on the unit before becoming comfortable and proficient enough to be left on their own to experiment with creating real pages of content. Even then, experience has shown that most "apprentice" inputters require on-going advice and assistance in creating material; again, this varies from upwards of one to three complete days depending on the individual's aptitude.

Although almost anyone can be taught to create material on the IPS unit, there is no mistaking the fact that Telidon is not only a new technology skill, it is also a new medium of expression for writing and for graphics. A new user must acquire an understanding and feel for presentational factors (developing an appreciation for how a page assembles, and what this means in communicating ideas - essentially the understanding that a page is not a static product for the viewer but is a dynamic process on display; this obvious fact is often the most difficult one for people to appreciate. Then, of course, the subtler feel for colour combinations, use of texture, character sizes, etc. must be acquired). Patience, concentration and real effort are required - on the part. of both trainer and apprentice - before individuals can be left alone to create material for entry onto the data base.

Like so many aspects of the overall project, training workshops for potential information providers have been equally satisfying and frustrating experiences. On the one hand there is the satisfaction of seeing someone acquire a new skill and the very positive result of: acquiring new content to add to the data base. Yet, on the other hand there is the frustration of having to train replacement inputters for information provider institutions (as they lose staff, or shuffle content responsibility from one person or set of students to another) resulting in duplication of effort to achieve completion of the same objective. As a result, we now encourage would-be providers to assign particular people to follow through consistently as inputters, or alternatively, encourage their people to take on major responsibility themselves for training new inputters (although assistance and advice from OECA is still made available if needed). This principle seems to work fairly well. For example, Ryerson staff trained by OECA have in turn taken responsibility for training their students as part of the Ryerson content production process and have only required minimal assistance from OECA staff. The demand on OECA facilities for training purposes have, however, remained high and still produce conflicts with production scheduling. This should ease

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somewhat as more creation units become available to information providers (whether full IPS units, or remote text entry terminals) and as information providers acquire sufficient numbers of trained staff that they are no longer in need of training facilities. At this point, their staff use of OECA facilities will become part of the overall production schedule.

On balance, the training workshops have amply justified their time, as numerous individuals (teachers, librarians, students, professors, graphic artists, to name a few) have acquired skills that have already started to enrich the diversity and scope of the Telidon data base, and will likely continue to do so in the coming years. As more information providers come forward requesting access to Telidon for their own content (and more are appearing every day, motivated by their own interest or stimulated by the "models" of information viewed on the user terminal), there will likely be ongoing demands placed on OECA staff and facilities for training support. To the best of our resources, this support will continue, although it is to be hoped, as mentioned, that the existence of a pool of trained inputters "in the field" and the wider availability of creation units, should alleviate much of this responsibility from OECA (which

has had almost full responsibility for field trial training to date).

2.5 Consultation

The project team itself underwent a period of familiarization with the intricacies of tree-structuring of the data base. It soon discovered that very few of those representing participating agencies had any idea of the rules governing page sequencing. This was only one of the many matters that required the guidance of members of the project team. Consultations were therefore conducted at meetings set up for the purpose, or intermittently over the telephone. As participants came forward with content proposals, it became obvious that they needed assistance with their applications design, even before being trained on the operation of the 1PS unit. Experience has shown, for example, that learning Telidon skills is much easier and more meaningful for the participant when he or she is trying to develop a page that will fulfill their own objectives for content. In fact, helping participants set objectives for their content (who is it aimed at, what purpose should it fulfill) is the first task in pre-production planning. Careful pre-production planning takes time and effort but is absolutely necessary for

useful and efficient production of content. Given the constraints of time (on the participants involvement if they have other responsibilities besides that of creating Telidon pages as most do; the demands on OECA staff and facilities, both in short supply) it is just not efficient to allow participants to struggle through, by trial and error, the production of content centered on work at the IPS unit. (It is not only time and resource inefficient, it is also frustrating to the provider if he realizes halfway through page development that another design route would have been better, or that certain objectives are not feasible and must be revised).

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Initially, participants may have either too high or too low an expectation of what the system is capable of, and helping them clearly define workable objectives is an important first start. Assistance is then given in the decisions that must be made regarding the general format and theme of the content. Inevitably, at this stage, help must be given regarding the nature of the tree structure and how it can be used. This phase of the pre-production planning establishes the basic framework for the content and is often the toughest part to work out. Once the general format and structure have been agreed upon, an evaluation of the Telidon tools available

to aid the provider is undertaken. This can include discussion on whether to use one of the OECA 1PS units, or whether a text-only remote entry terminal - if available - should be used. Can the graphics be done using the joystick, or as in Algonquin College's case, is access to a graphics tablet going to be necessary? Will participants require the use of the video attachment to the one 1PS unit to accomplish their needs? These and similar questions must be dealt with before discussion can progress to identifying the number and content of each page. Ideally, designing each page of content (illustrating how each should look, the order in which elements are displayed, what elements should be there) should be done ahead of time, before the provider sits down on the 1PS unit. OECA has developed printed grid sheets to aid providers in this stage of production and assistance is given in helping them develop these sheets into representative "storyboards". This "storyboard" approach allows the user to assess the design and overall feasibility of the content at a vital formative stage, when revisions can be easily made and assistance, if needed, can be sought to correct errors in logic or design (much easier to do ahead of time than on the 1PS unit!). This "storyboard" approach also allows

the provider, and the OECA, to assess how much work and time will be required in the actual production stage.

A great deal of OECA staff time has been/and is spent working with providers in this pre-production phase of content development, but it is one of the most satisfying and stimulating parts of the project, not only for the staff but for participants as well, as they see their ideas begin to take concrete shape.

Although no count was kept of the amount of telephone communications occasioned by orientation requirements and the need to respond to general and specific inquiries coming from within and beyond the boundaries of Ontario, the level of interest has been so high, and the inquiries so frequent, that it has frequently been difficult to handle the sheer volume.

2.6 Production

Once the pre-production planning stage and the training sessions nave been accomplished, scheduling time on the IPS units is organized and information provider production activity is undertaken. As well as the provision of access to the OECA IPS facilities, ongoing staff advice and assistance is provided as needed. In specialized cases,

such as the Valley Wood Public School teachers who were faced with long journeys into Toronto from St. Catharines, the actual production of content has been undertaken by OECA staff. Although this task has strained staff resources, at times, it is a short term solution to achieving the objective of allowing educators the opportunity to use the Telidon technology for their non particular applications and of allowing the OECA to build a diverse, interesting and relevant data base. In order to continue the achievement of this objective, it may be necessary to negotiate with interested providers (who cannot, for one reason or another, input their own material) for funding to allow the OECA to increase its limited staff resources by hiring trained freelancers to create their content. Whatever the case, the involvement of OECA in facilitating information provider production will continue to take its place in the range of support tasks required of the OECA within the coming year.

A distinction must be made between the role of the OECA project team in supporting the production activities of other information providers, and the role of the OECA as itself an information provider. The reader is referred to section 6, below, for an account of the project team's work in creating "models". This work, and the devising of appropriate indexes for easy access to the total educational data base, can be regarded in one sense as support activities for both

information providers and users. Additionally, the project team is engaged in an on-going production process directed at creating data base sequences that reflect the OECA's own curricular objectives, some ancillary to the television services presently offered, some exploratory of new ground appropriately addressed via Telidon, both broadcast and on-line.

3. Quantitative/Qualitative Description of Liaison Activities

An accurate picture of the amount of liaison work involved (phoning, contacting, meeting, demonstrating) in establishing a field trial may best be rendered by describing the spectrum of activities and indicating the quantity of these activities.

For each meeting arranged and as a result of each meeting held there are phone calls, and the number of phone calls each day is increasing exponentially. The present writer can attest that at the time of writing, several days have been spent dealing with only the phone calls coming in and still there is a list of people who have called and await replies. Then, too, correspondence, creating necessary form documents for information providers and users and writing such as the occasional Telidon and Education Update demand almost daily attention. Keeping in touch with those in the field trial and visiting them occasionally must be done as well as deciding upon the schedule for the placement of terminals, arranging for Bell modem installation and handling how best to arrange repair of Norpak equipment. Terminals and modems located in areas other than Toronto can pose a nightmare if they do not function. Take for example the Bell modem at the University of Ottawa that did not work. It took five hours on the phone to arrange for Bell and Norpak to arrive at the site at the same time.

3.1 Number of meetings held, persons contacted.

The majority of the meetings held were capsulized in summary records. These records show that about 200 meetings were held for which some follow up action was required. (A selection of the summary records is at Appendix 3). The number of persons contacted during this fiscal year is estimated at approximately 5,500. Besides this a visitors' log was kept at the project headquarters. The log shows that approximately 500 visitors came through our portals; unfortunately, there were a number whose names were not recorded. Many of the visitors were from other countries: Israel, Belgium, France, England, Australia, the U.S.A., Japan, Egypt, Switzerland. Some, like those from China, came in formal delegations. Representatives from all areas of Canada have found their way to our office.

As the year progressed we found that invitations to seminars and conferences and requests to write articles and give papers increased to the point where members of the team could not possibly meet the demand. Instead such offers were accepted only if they could further the objectives of our field trial or in some way provide support to the Department of Communications. Seminars attended ranged from those in Toronto (Metropolitan Toronto Community Colleges, MicroAge 79, the Ontario English Teachers Association, the Ontario Library Association) to many throughout the province and Canada. Internationally invitations to Australia, the Aspen Institute and the National Association of Educational Broadcasters (NAEB) convention in Chicago were accepted. Each conference was unique. For example, in Australia the concept of telidon piggybacked on television/radio/ telephone satellite transmission to isolated areas, engendered much interest. At the NAEB the American public broadcasters and educational television people began to realize that although they were experimenting with satellites, other technologies were being considered in Canada, new technologies which could have a profound impact in their area. (See trip reports attached).

3.2. Range of agencies and representatives contacted and the focus of communications.

When we first began our work to establish the field trial our aim was to contact those who might be interested in supplying information to both our teletext and our interactive field trials. This prompted our meeting a wide range of people.

Inherent in the teletext technology is a demand for information that is time-sensitive, succinct and of a generally informative mature. Such material as news, weather, sports, stock market quotations, TVOntariorelated material and shorter promotions and quizzes were thought to be suitable. Consequently, the Toronto Stock Exchange, Maclean Hunter/Financial Post, Globe & Mail, Torstar, Atmospheric Environment Services, Reuters and Broadcast news were contacted.

The interactive data bank proved especially attractive for those in the field of education since a degree of interaction might facilitate simple computer-assisted-

learning sequences and large amounts of specific information could be prepared. To this end large Ontario educational institutions such as OISE, Ryerson Polytechnic, the universities and the community colleges were approached. Since we are interested in assessing the educational merit of Telidon at all grade levels, elementary and junior high as well as high schools (English and French) were introduced to the Telidon system. The school for the deaf in Belleville was asked to consider joining our field trial since we felt that the Telidon could serve the handicapped and the deaf in particular.

Information retrieval capabilities immediately defined the libraries as prime contributors to our field trial. Both library administrations and particular neighborhood libraries as well as faculties of library science seemed eager to have contact with the system and to see what it could or could not do. Needless to say, the tree structure organization of material in the data bank is one target of their interest.

OECA is by its constitution both educational and a provincial crown corporation. The affiliation with provincial government ministries of all types meant that in Ontario government circles news of Telidon quickly spread. The dissemination of public information is a problem that plagues most agencies in this area. Federally, Stats Canada and the Atmospheric Environment Service were contacted about Telidon and have since become ardent supporters of the field trial. Provincially, the Ontario government will coordinate its various segments to test the potential for Telidon to make available a wide spectrum of information to the public in homes and offices. For example, the Ministry of Community and Social Services now publishes a pamphlet on a work incentive program that is so convoluted that it is incomprehensible to the intended user. They have asked us to convey this information simply in Telidon form.

The OECA project team considered that it was important for as many people as possible to view Telidon during these initial years and accordingly met with officials to discuss placement of user terminals in public locations. Meetings with the Ontario Science Centre will likely fulfil this requirement. As well, contact with officials from the CN Tower would indicate that a terminal may be placed there. CN Tower management are quite enthusiastic about such a possibility and indicated that they would build the display area necessary to afford maximum access combined with maximum security.

In order to foster sound working relations with the above-mentioned organizations it was necessary to meet with larger organizations in the related areas to inform them of what we were doing and how their particular concerns might be furthered. For example, the Canadian Association for Adult Education, the Council of Regents of the Universities, the deputy ministers of our funding provincial ministries, the Canadian Radio Television Telecommunications Commission and senior boards of education personnel saw first hand what Telidon is and were told of the plans to test it in the coming year. We also invited various charitable and public service organizations such as the YMCA/YWCA. In sum, while inviting many to join in the field trial with us we

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also undertook the responsibility to acquaint as many as possible with Telidon, its history and its potential.

News that our field trial was being established and would become the first operational test in Canada spread quickly. Calls were received from several other provinces to contribute sequences to their data banks or to help them prepare in some way for their own trials. The media, particularly in the United States, has during the past year either phoned regularly for the latest happenings or visited us in Toronto. A director of AP wire service was enthusiastic about Telidon as he left our office. The secretariat for the AP Board of Directors was subsequently in touch with us for more details.

Among expressions of interest from governmental bodies were those of the Ontario Ministry of Culture and Recreation, and the Premier's office. Demonstrations were given for the Deputy Minister, Dr. Wright, and for Alan Gordon of the Premier's office, resulting in the establishment of follow-through liaison with William Calvert of MCR. The provincial government is already moving to test a computer-assisted means for increasing

citizen access to government information, using the computer to serve operators who are contacted via telephone by the public. The question to be explored with the OECA is whether Telidon offers a long-range opportunity for direct citizen access to government information. Meetings have been held, but the level of participation of the government as an information provider remains to be determined.

Mention has been made elsewhere of OECA participation in the Metro Conference of Colleges of Applied Arts and Technology convened at the King City campus of Seneca College. One focus of the conference was on the significance of new information technology, and the Telidon project team was represented on the panel which focused the issues. Considerable interest in Telidon manifested itself, leading to follow-up demonstrations and meetings. These in turn dove-tailed with the overtures made by the Ontario Institute for Studies in Education to Metropolitan Toronto Colleges, leading to a joint undertaking to supply data base content descriptive of educational opportunities offered by the colleges.

It should be mentioned that the chairman of the Council of Regents, C.A.A.T., was also briefed on the Telidon project. Individual colleges, however, enjoy complete autonomy in decisions affecting participation in projects such as Telidon and Education, and accordingly, our dealings have been directly with these institutions.

It has been deemed advisable for the project team to maintain a watch on conferences outside of Ontario that focus on the new information technologies. Among the conferences attended was one at Aspen, Colorado in August, 1979, under the auspices of the Aspen Institute, which surveyed the state of the art throughout the world, and focused particularly on U.S. policy recommendations in the videotex field. The impression received was that the private sector in the U.S.A. wants a good deal more information on the various competing technologies before committing to any one standard. Because so few experiments with videotex in education have surfaced south of the Canadian border, the prospects for mutually beneficial exchange appear to be some way off.

A somewhat different impression was gained at the conference on computer assisted learning convened at Vancouver in February by the National Research Council and the University of British Columbia. Videotex as such was not a prominent focus of attention, but there were a number of indications of the convergence of computer-assisted learning and Telidon. Out of the awareness of specific developments should come important data base opportunities for those participating in the Telidon and Education project. 4.1 Level of Interest in the Project

Not counting affiliates, there are 15 universities in Ontario. Of these, 12 have been represented in meetings and other communications with the Telidon project team. Of the 12, seven have participated in the project as information providers or test sites. They are: Carleton University

> University of Ottawa Ryerson Polytechnical Institute University of Toronto University of Waterloo University of Western Ontario York University

There have been expressions of particular interest from Lakehead, Laurentian, McMaster, Queen's, and Windsor.

There are 22 colleges of Applied Arts and Technology in Ontario. Of these, 13 have been represented in meetings and other communications re Telidon. Of the 13, four are participants in the Telidon project, applications from two more are under consideration, and expressions of particular interest have been identified on the part of four others. Colleges participating at present are:

> Algonquin, Ottawa Centennial, Scarborough Humber, Toronto Loyalist, Belleville

There are over 100 Boards of Education on Ontario, administering more than 4,000 schools. Contact with representatives of upwards of 16 Boards have been made. Arrangements for deployment of terminals have been completed for 10 schools located in St. Catharines, Acton, Ottawa, York County, Toronto, and Hamilton. Requests from schools in other locations are under consideration, and deployment will take place as resources permit.

Reference has been made elsewhere in this Report to the interest expressed by the Ontario Teachers' Federation. It should also be noted that more and more requests are surfacing for representation of the Telidon project team at professional development days that have identified computers in education as a theme worthy of consideration. It is clear that some Boards are already exploring the use of micro-computers in the classroom, while others have no such identified objective as yet. Those that are exploring computer applications appear to relate to Telidon readily, sometimes because it permits an extension of the study of telecommunications as a curriculum unit, sometimes because of potential applications.

The public libraries in Ontario are under the jurisdiction of municipal governments, and therefore make no joint policy decisions. However, the voluntary library associations have demonstrated a keen interest in Telidon as one element in the changing computer/ communications picture. Individual libraries have explored the practical implications of the project. Terminals have been deployed at two library sites, and applications from several others are being processed.

4.2 Extent of Commitment of Agencies Contacted

From the foregoing (4.1), it will be apparent that initial expressions of interest have been followed by formal commitment to participation in the project in a surprisingly large proportion of those institutions contacted. One aspect of the commitment is that those participating undertake both to create and systematically evaluate page sequences pertinent to their curricular objectives. To summarize our experience of the past year, the willingness to participate on these terms is not in doubt, but the means to realize the commitment have posed problems for the participants.

4.3 Contra-indications noted

It will be evident from the reading of other sections of this Report that the principal cause of delay in participants' fulfilment of project commitments has been constraints upon the availability of facilities and resources of time and personnel necessary to the accomplishment of their objectives.

On a somewhat different front, a number of interested parties have been dissuaded from active participation by current limitations of the system, -- the absence of keyboards and key-board access, the absence of interfaces that permit access to third-party computers and data bases, delay in the arrival of remote entry software, the limitations of the present generation of entry terminals with respect to tent-entry, rotation of graphics, scaling, and joy-stick operation.

With reference to those agencies that have had the technology demonstrated but have declined to participate, it can be said that many educators approach Telidon from a background of computer-assisted instruction, and perceive Telidon as primarily an information retrieval system. Some have said that until down-line loading to the user terminal is available, there is little to be gained by use of a textual/graphic communications device.

5. Inferences re data base opportunities

One of the most exciting, and yet often frustrating, experiences faced by the OECA team has been the coordination and implementation of data base opportunities for interested participants from the public and private sectors. Faced with the obvious interest and enthusiasm generated in potential users/information providers after demonstrations of the Telidon technology, the next objective - giving access to the data base through facilitating production of materials created by willing participants - seemed fairly straightforward initially, and then became an increasingly complex process.

For many potential information providers, a major obstacle to delivering input to the Telidon host was the necessity of expediting computer-to-computer communication, to facilitate exchange of data from the providers' host computer to the Telidon host computer. In the face of a total lack of interface programs and protocols plus the absence of a remote communications package to down -line load input, many potential providers either shifted their focus to examining the software/hardware interface problems posed by Telidon, or revised their content plans to accommodate limited, manual input.

Some simply put their ideas for the data base on the shelf, for future examination. These limitations pertained to the news media, in particular, and have delayed content and delivery to a significant degree.

For those providers willing to participate in content production - those with and without information already in data bases - the range of support tasks they required from OECA staff and facilities often outstripped the the capacities of the OECA and the DOC combined. This is a point detailed earlier in the paper, but worth reiterating here for its impact on limiting the data base opportunities for these participants. Nevertheless, despite varied setbacks and problems, progress has been made in developing and inputting selected samples of material from a number of varied sources.

To give a review of the types of content proposed by participants is, in fact, to review the diversity of groups contacted by OECA. There were representatives from elementary and secondary schools, community colleges and universities, from the media (Broadcast News, Reuters, Maclean Hunter, Globe & Mail to mention some) and from public agencies (Atmospheric Environment Services, Ministry of Consumer & Commercial Relations, Ministry of Education, Ministry of Tourism to name a

selected few) or public service associations and institutions (Ontario Cycling Association, Ontario Science Centre, Federation of Ontario Naturalists, Canadian Association for Adult Education, for example) and public libraries.

The potential applications for Telidon in school classrooms has stimulated widespread excitement and practical interest on the part of teachers and trustees. One indicator of the level of interest stirred came from C. H. Whitney, Executive Director of the Canadian School Trustees Association. He was very impressed with the potential of Telidon to equalize educational opportunities in remote areas of Canada. On a more concrete level, teachers have proposed specific applications of the system to support curriculum. Mathematics is the focus of teachers at Fort William Collegiate (Lakehead Board of Education), at Alta Vista Public School (Ottawa Board of Education) and at Garneau Secondary School (Ottawa Board of Education). Current affairs material is presently being planned by teachers at Lord Elgin High School (Burlington) while teachers at Valley Wood Public School (St. Catharines) have already created three units of information currently in production on the IPS unit, in the areas of social studies and English grammar. The Lanark Board of

Education, the Metro Separate School Board and the Hamilton Board of Education are currently assessing what types of information they wish to input.

Despite high interest levels, a common problem often stated was the mode of production given remote locations from the host computer. In one case, for example, the Lakehead Board of Education has access to the local university's PDP 20/20 that could store a Telidon data base (to avoid long distance charges - another common worry) and are also interested in the use of an ASCll keyboard attached to a Telidon decoder/terminal to create their own content. Given the possibility of their own creation terminal, a regional data base, and access to teletext content, the potential for distributing to and receiving information from, Lakehead educators is very real. Without the possibility of creating their own material in a modified user terminal, the likelihood of acquiring data for the field trial is slim. One solution to this quandary has been tried, however. Although teachers at Valley. Wood Public School in St. Catharines did not have remote entry terminals or the staff to send to Toronto for inputting, they did travel in for consultation in planning their Telidon content. Subsequently, they delivered complete "storyboards" to the OECA, which

Public School are facing the challenge of placing this information within a tree structure without losing the degree of interaction already available in microcomputer systems. A lot can be done to achieve one to one interaction with the system, given ingenuity, but their content needs also raised one limitation of the present technology. What these teachers would like is the ability to monitor the progress of students. (individually, and as a group) to identify areas of weakness and strength. This implies computer managed instruction where teachers have access to feedback on students' performances in the system. When Telidon has the capacity to give evaluative feedback on system usage , it is likely that many more educators will become involved as information providers, as this one area alone has been consistently raised as a requirement in many educational applications.

In the area of special education, a very positive breakthrough was accomplished with representatives from the Ontario School for the Deaf. Despite initial doubts about the applicability of Telidon both Catherine Michalski (Superintendent, Ontario School for the Deaf) and Elgin Vader (Ministry of Education Teacher Education Centre for the Hearing Impaired, Belleville)

undertook responsibility for the inputting process. A combination of lack of resources at OECA (staff time plus limited access to overworked terminals) plus lack of disc capacity at DOC has delayed delivery of this material to date, but the delay is temporary and the applications should prove to be valuable contributions once on the system. On the positive side, the creation process produced a greater appreciation on the part of the participants for what Telidon could accomplish, and acted as a catalyst for both increased understanding of the technology and a willingness to explore other applications.

The experience gained in consulting with educators on the planning of content, specifically geared to present Telidon capabilities, has been invaluable. It has shown the system's ability to create particular educational applications, stimulated creative approaches to learning objectives and sustained faith in the future potential of the system.

The potential of the system has also challenged those educators already involved in CAI courses to consider the relationship of Telidon within this context. For example, not content to simply produce a Telidon informational unit on set theory, teachers at Alta Vista

left quite enthusiastic about the potential of Telidon. Mrs. Michalski's field of specialization is language learning and she has made a committment to produce a unit in this area for inclusion in the data base for September. Not only will this provide a valuable opportunity to evaluate the use of Telidon for the learning impaired, but, as she pointed out, may also be valuable in language acquisition skills for new immigrants.

OECA involvement with colleges and universities revealed particular concerns associated with data base opportunities. In general, the colleges and universities expressed great interest in the potential of Telidon and are currently grappling with the implications of creating a data base which reflects an indepth approach to searching content descriptions of courses offered, or to providing alternative approaches to CAI courses or diagnostic tests. This interest resulted in the planning, or actual production of representative content as well as an interest in the technical challenges inherent in developing CAI material for Telidon. For example, York University developed a package of information (now completed and on disc) describing Telidon as a communications system; the content created served several purposes. Creating the material was included as part of a computer programming course in order to

familiarize students with the technology; the production process enabled York professors to experience "hands-on" contact with the IPS terminal which they desired as part of a background to working on a micro-computer/Telidon interface and to evaluate the variables to be considered in formatting through a local computer into Telidon language. Compared to this specialized motive for creating Telidon pages, Ryerson Polytechnical Institute developed two representative content units that should be useful as models for other educational institutions.

One unit, developed and currently in the system, dealt with a course listing approach to attract students into a program - in this case, the distance education courses available through Ryerson. The other unit, currently in production, is planned as a support package for students taking the Hotel Management course.

OISE and the Toronto CAATS (Centennial, George Brown, Humber and Sheridan) have decided to cooperate on a Calendar of Events application (suitable to teletext as well as videotext) as a promotional activity. Consequently, students from these colleges have been given training as inputters by OECA staff, and the material is currently in production (greatly aided by

the use of a video camera attachment for transferring the colleges' graphics onto the screen to aid drawing). Besides this joint collaboration of information, individual applications are currently being developed. Centennial for example, have developed an English grammar game (suitable for high school or college levels) and a riddle game for children. These will be available when more disc capacity at DOC is available. Outside of Toronto, UWO's faculty of information science is investigating the input of data relevant to the needs of Londoners. The University of Ottawa is currently investigating the development of an English skills unit.

In a more immediate time frame, Ron Spivock of Algonquin College is proceeding with the creation of graphics -oriented information for Telidon. He has a collection of the original cartoons concerning the Dreyfus affair. He is going to create a text/graphics learning unit based on this infamous affair, relating it to current political concerns. However, in meetings with OECA to develop this unit, it has become increasingly clear that the success of this type of graphic material depends heavily on the use of a free form graphics tablet attached to the IPS unit if it is to be successful. Inputting of this material has thus been delayed until this technical development has been acquired; it is hoped that this will be in the

near future. If this technology can be made available, it will considerably open up a range of educational and informational applications not currently possible.

A number of other applications by various colleges -and universities are imminent (Carleton University, the Universities of Waterloo and Western Ontario for example) but the above show the range of content currently being considered. In general, progress in delivering content has been delayed because of the problems inherent in creating CAI material within the present Telidon configuration (tree structure, numeric keypad), the lack of remote entry terminals, and computer-to-computer interfaces, and the hesitations produced in users concerning the problem of long distance charges in accessing material. On the positive side, OECA staff have had the opportunity to work with innovative educators in developing content in a number of fields, resulting in greater mutual appreciation of where the technology can be best utilized and where its potential can take it. It is obvious to all of us that we have just started to uncover the tip of the iceberg as far as educational applications are concerned.

In the realm of general information providers from government or other public agencies, the same problems

of long distance charges, need for remote entry terminals, and computer-to-computer communication recurred as ongoing themes limiting data base opportunities. For example, the Ministry of Culture and Recreation is currently involved in the use of computers to assist Ontario citizens to access government generated information via a phone-to-information officer-to-computer pathway. Although recognizing the potential for Telidon to allow the citizen direct access to such information, the present limitation of the tree structure and the numeric keypad has meant that, at least in the short-run, this potentially useful content will not be available for distribution via Telidon. Similarly, representatives from Ontario Government Publications expressed reservations about the ability of a numeric keypad to access an alphanumeric data base best stored in a more flexible format than that of a tree structure. However, as their information is currently a manual print resource, they are very interested in the future use of a computer system to handle the material. On an interim basis they may yet input some selected material using the IPS unit at OECA, or on a remote entry terminal using the Texcon program. Discussions with these two groups brought home the fact that despite interest and enthusiasm for the technology, active involvement of government agencies (with their huge and

and diverse sources of information) will likely not materialize until computer-to-computer communication is realized. This point was also emphasized in meetings with Department of Employment and Immigration representatives concerning the potential for "marrying" the interactive CHOICES program to Telidon. So far the demand for this program has outstripped the facilities available; Telidon could ensure much greater opportunity for access to the public if the technologies could be interfaced.

Another group which would prefer computer-to-computer communication is the Atmospheric Environment Service. However, following many meetings with OECA staff and the sustained interest in the part of the AES to provide some type of content, plans are progressing to share weather information (produced on an IPS unit located at the Malton site of AES) with the Telidon field trial public via the OECA part of the data base. As in the case of the Algonquin College material, however, production of weather information could be greatly expedited if a graphics tablet were available for the free form drawing of such graphics as isobars, cold/warm fronts etc. At the moment, the limitations of the joystick and the problems of drawing free form curves etc. are having a dampening effect on production.

Delays in the delivery of the remote communications package have also prevented the testing of downline loading of AES weather information directly into the OECA broadcast host or into the IPS units - a production necessity for the provision of real-time, daily delivery of such material.

On a smaller scale, but on a cheerful note is the positive support of institutions such as the Ontario Science Centre, the Federation of Ontario Naturalists, the Ontario Cycling Association and Ontario Travel in allowing OECA to have copyright free usage of their publications for source material, although responsibility for inputting their information has been left almost entirely in the hands of OECA. Although creating more production responsibility for OECA staff, this cooperation has been welcome as a timely source of ongoing, interesting information for inclusion in either the videotext or teletext data bases.

Last, but not least, has been the involvement of public libraries as information providers. For conversion of large library data bases to Telidon, the familiar need for alphanumeric accessing and machine-to-machine translation of existing data was stated. However, in this particular application, OECA staff met and discussed the problems of a Telidon to Marc (the standard library format) interface with representatives from the University of Waterloo. They were keen to work on a software aspect of Telidon and agreed to take on this task provided DOC agreed to fund it. Once written (as the project is now proceeding) it is likely to allow the opportunity for large bibliographic data bases (such as the UTLAS data base, a nationwide source of information to libraries) to be accessible directly to the public. This development has created quite a stir in library circles and could provide a number of educational spinoffs useful to educators as well as members of the public.

More immediate input has come from librarians working in the Scarborough Public Library System and at the University of Toronto's Faculty of Library Science. Working with OECA staff, a number of different applications (oriented to library patrons) has been produced and put on the system. The process has aided those involved in gaining a clearer understanding of how Telidon can supplement or aid their library services and continued involvement has been promised. The current material on view has stimulated interest in the system, and as a result, the Burlington Public Library is currently planning material for input later this spring. The ongoing, involvement of these

groups should provide sufficient content on the system for substantive evaluation to be undertaken within the next year.

Looking back at the development of content provided by participants in the OECA field trial, it is evident that a great deal of progress has been made in laying the groundwork for building a large, diverse data base within the coming year. Valuable experience has been gained in the process of guiding participants through a production process, new and creative applications have been identified, as well as attempted, and despite the frustrations incurred in facing up to them, many of the major obstacles in providing data base opportunities to participants have been identified - it represents the first step in resolving the needs and priorities of future development. Working with diverse participants in content creation/planning has been a very involving, frustrating (at times) yet often satisfying, part of the past year's field trial development. Cooperative participation in the coming year should be even more satisfying as a substantial data base takes form (and in the added context of two modes of distribution teletextand videotex).

A pre-requisite of the field trial proper is a data base that can be utilized and the application thereof tested. A pre-requisite of consortium members producing material according to appropriate presentations standards is a selection of models presented by the project team. Thus the developmental phase of the inter-agency exploration of Telidon in education entailed the production by OECA of a variety of models designed to lay a foundation for effective presentation. In part, this was a matter of the appearance and format of individual pages, and in part a matter of the concepts underlying the sequencing of material.

The process of establishing a functional and attractive "style" will continue for the life of the project. Presentational matters were however, made the focus of attention in the early stages of activity, and tentative decisions made re "headers", re advisable margins, and re user instructions appearing on the page. The use of various colour combinations was experimented with, and a conscious effort made to 'push' the graphics capability of the medium as far as we could take it in the time available. On the basis of this exploration, the project team has summarized some of its conclusions concerning graphic presentation and textual style. (See Annex 1 for this summary). At the concept level, a persistent effort was made to explore different relationships between the viewer and the material presented. It was perceived, for example, that even the presentation of functional facts is not an obvious matter. If the user has an information objective and wishes to search the data base for it, a means must be provided for easy connections to be made. The connections indicated in a table of contents may be totally irrelevant to the objective already established by the searcher. Because the intended user of the project data base is most apt to come at it from an educational context, it was deemed advisable to provide indexes that draw connections derived from that context. Thus, work is continuing on accessing the data base according to educational level and academic subject, as well as alphabetically.

Other hypotheses were explored. The assumption was made that for many, functional information would not be acceptable if merely martialled in an orderly way. The user may require a sense of dialogue, of interaction, and may well appreciate humour as an element of the presentation. Thus, Dizzy Decimals, rather than Review of Decimal Operations. Further, it was assumed that instructional purposes might be better attained by making information an incidental aspect of an intellectual game, "clues" being the information necessary to the successful

pursuit of a goal. Thus, Tag the Flag, and Who Am I? To take a specific example, Tag the Flag, viewers are asked to identify a country's flag, which is given prominent display on the page. If the viewer thinks he knows the answer, then he is directed to the answer page. However, if the flag is unknown to him, he is directed to a series of pages which provide graphic and textual clues. These clues involve the viewer as an active participant in a learning game, for not only do the pages create interest and provide stimulation (visually and intellectually), the information imparted in the process indirectly gives the person facts about the country (for example, one clue for Switzerland is the fact that it is the headquarters of the International Red Cross). The clues lead logically into the answer page. At this point, the individual is given the choice of trying a new Tag the Flag sequence or can learn even more about the country just identified by going to additional pages. These pages give basic facts about the country under review (languages, capital, currency, government etc.) as well as a referral (such as an embassy or consulate--previously contacted for cooperation--where the viewer may write for more indepth information). These sequences, then, can be viewed as entertaining learning packages, or as springboards to further discussion and interaction. As such they are useful in their own right, and also serve as useful models for others planning similar applications.

It is the opinion of this writer that such models have had an influence, not only because of indications that they have been used for demonstration purposes by others, but because many educators who have attended demonstrations at the project centre have endorsed their applicability. It seems equally clear, however, that thus far relatively few fresh approaches have been tried by participating schools, colleges, universities, and libraries. Undoubtedly one of the reasons for this is the limited availability of time and facilities necessary for good quality materials to emerge. Another reason may be the relative scarcity of people who are comfortable working creatively with a new medium. In either case, more consideration should be given to ways to address the deficiency. Without an appropriate data base, the evaluation of the technology will be compromised.

7. Summary and recommendations

Developmental activity necessary to support inter-agency exploration of Telidon in education comprehends an array of functions, -- promotional activity, organizational structuring, continuing liaison, production orientation and assistance, follow-up consultation and technical advice, logistics, modelling of standards and applications, data base creation.

The experiences of the past year have indicated that the level of activity necessary to perform these functions is very high, -indeed, higher than the resources presently available to the project team will permit. It is worth noting that the magnitude of the effort required is in large part a reflection of the level of interest that the joint Telidon project has elicited. On the other hand, using the criterion of progress achieved in the creation of a data base keyed to the particular needs of educational institutions interested in the applicability of Telidon systems, developmental activity has fallen short of aspirations. The project team is of the opinion that, even with an improvement in the availability of facilities required for the expeditious creation of Telidon page sequences, the process of preparation needed in order to mount a field trial of the technology would be long and complex.

This is not surprising. The skills required to put out a newspaper or magazine have taken several hundred years minimum to develop, and can be passed on from one generation to another only by extended study and practical experience. Similarly, effective computer-assisted instruction and computer-managed learning requires time and talent out of the ordinary. The inference is clear, -- educational applications of Telidon cannot surface overnight. That obvious fact must be taken into account in planning all Telidon field trials. If it is not, the consequence is apt to be a backlash of disappointment as users encounter insubstantial or ill-presented data base materials.

There is no implication in this that field trials should be delayed until all components have been fully developed. Many of the components of a fully designed system depend for their "elegance" upon an evolutionary process incorporating feed-back based upon trials in the field. Moreover, the stimulus to move forward the creation of important system components may have to come from early tests that reveal an urgent or central need. But the case must be made for enough resources and for functional components at an early enougn stage in the field trial to provide a basis for a fair test of applicability.

Recommendations:

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The recommendations that follow focus on a range of matters bearing

upon the successful conclusion of Telidon field trials in general and the OECA field trial in particular.

1. Data base opportunities

1.1 As an important element in the provision of a rich and variegate data base appropriate to a range of applications and needs, it is recommended that the means be arranged for the supply of topical information at the earliest possible point in time. Reference is made especially to news bulletins, weather reports, market information, all of which have practical application to educational objectives.

In making this recommendation, it is assumed that the means are in large part a matter of technical components such as software interfaces required for the automatic "translation" of existing information feeds to Telidon format. It is recognized that in some instances this function can be handled at the host and in others at the source of the feed. Whether or not the originators of the information are motivated to supply the resources necessary for the solution of the interface problem, it would appear that a higher level of activity in the system co-ordination area is indicated.

1.2 Distinct from but related to the focus in 1.1, above, it is recommended that means be arranged for access to third-party data bases that offer opportunities for research or for retrieval of statistical and scholarly information.

It may well be that in the long run, data bases created specifically to serve educational applications of Telidon will provide the only fair test of the serviceability of the technology. Meantime, the product of years of thought and organization in existing data bases should be made accessible as soon as possible. Prominent among these should be CAL banks.

1.3 Having in mind present limitations of time and funding in educational circles, and possible shortages of creative expertise in the application of a very new medium, it is recommended that consideration be given to selective funding support of particular data base proposals designed to test the applicability of the medium to specific educational objectives and contexts. A proposal directed to the needs of the hearing-impaired is offered as a possible example.

What prompts this recommendation is the perception that highly creative "writers" can be identified who could be brought together with educators interested in specifying particular objectives to be achieved but who have not the funds or time to fully realize the objective themselves.

Meanwhile, the data base languishes. It is recognized that the educational criteria for supporting particular applications would need to be resolved to the satisfaction of duly constituted educational jurisdictions. It is noted that precedents exist for research projects supported jointly by federal and local agencies.

2. Data base operation/management

2.1 It is recommended that the highest priority be given to steps required to make the "interactive" Telidon host operational, as distinct from experimental.

No criticism of the highly committed, expert, and overworked team tending the existing interactive host is implied. It is the perception of the Telidon and Education project team, however, that the contention between experimental and operational demands upon the host computer leads to perturbation in both camps. From the point of view of the educational user*, the perception of applicability of the technology is coloured by the hindrances to getting on the system as needed, to staying on the system, to reliable retrieval, and to affordable cost of retrieval. From the point of view of the information provider, the feasibility of educational applications of Telidon is related to whether pages

^{*}See Annex 2

entered on a floppy disk can be loaded into the host computer expeditiously, and lodged in a readilyaccessible part of the data base.

2.2 It is recommended that visual cueing on the screen be reviewed, with the objective of making improvements in indexing and in feed-back to the user.

The OECA is addressing the indexing requirements of users who approach the data base from educational perspectives, but this contribution is visible only after the user makes a decision to access the Telidon and Education section, a sub-set (1 of 9) of the menu. The recommendation however also relates to such practical concerns as whether a user has available a visual "read-back" of how long he or she has been on line, or whether the system will be out of operation on a particular day or at a particular hour. The system needs to describe itself to the user, to "talk" to the user, to the advantage of all concerned.

2.3 It is recommended that the summarizing capabilities of existing data base software (e.g. usage/performance statistics) be publicized in detail, and that this capability be expanded to accommodate feedback of analytical appraisal of user responses. This is particularly relevant for those users desiring computer managed instruction, or those providers requiring evaluation of the usage of their content.

3. Information provider technology

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3.1 It is recommended that service and technological support of IPS terminals be accorded more prominence, preferably by mobilizing personnel whose primary obligation or commitment is to this service.

The point of the recommendation is not that the competence of these presently engaged in this support service is in question, but that such service must jostle for pre-eminence along with other commitments, with the result that the negative consequences of technical failures and software deficiencies are protracted, and the scheduling of production activities perturbed. One suggestion is that services be decentralized somewhat, with personnel being located within easy reach of the main concentrations of terminals.

3.2 Consistently with the foregoing, it is recommended that the process of encouraging the setting up of Texcon terminals at information providers sites be extended.

The experience of the past year indicates that no amount of willingness on the part of the Telidon and Education team to facilitate the entering of Telidon pages could adequately address the problem of distance.

Information providers are located all across the province, and it is impossible for most of them to gain access to the IPS terminals. Those relatively nearby find themselves needing much more time on the system for experimentation and straight production time than is afforded by the procedure of "booking on" for several hours at a time, especially in competition with many others. While the Texcon system is of value primarily for text, the majority of IPs have much need for such terminals. It should be noted that recent experience suggests that the supplying of a Texcon software disc and accompanying manual is not adequate support for a good many potential users of the technology. Some means of facilitating operations should be found.

84

3.3 It is recommended that resources be allocated to the continued up-grading of IPS terminals.

It is recognized that the up-grading of production operations is an on-going objective of the DOC. Improvements in software as applied over the past year are an indication of this. On the assumption that shortage of resources is a factor in the rate of amelioration, it is recommended that this deficiency be addressed as soon as possible. The effect would be salutary not only in reference to expeditious page creation, but in reference to the competitive position of Telidon terminals and other hardware entering the market. The project team has identified as items deserving of attention, the addition of a graphics tablet, the installation of software permitting picture manipulation (scaling, rotation, manipulation of collectives), and the inclusion of wait command and transparent mode functions as part of the standard set of functions.

4. User terminal components

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4.1 It is recommended that current up-grading of hardware governing access to the Telidon data base be extended as soon as possible.

Users have made it painfully clear that access to the data base is cumbersome and oft-times impossible. Eight or ten ports for dozens of user terminals are inadequate under current circumstances. The process of dialling one after another of many numbers is inefficient and discouraging, and leads to abuse in the form of users grabbing a line before they really need it, in order to have assurance of access. Automatic dial-up is needed, or at the least, one number and a port contention device that transfers the call to any available port.

4.2 In reference to dual-mode user terminals (broadcast/ interactive) it is recommended that the means of switching from the one mode to the other be simplified.

Totally unskilled users such as those featured in the field trial will be daunted by the prospect of having to insert a pen-knife into aperture #3 at the back of the decoder housing, in order to turn an arrow from one position to another, while at the same time making sure that the right button and the toggle switch on the TV set are in the correct position.

4.3 Having in mind the importance of down-line loading for educational purposes, it is recommended that the priority of this feature be increased, and that the implications for terminal memory capacity and software design be re-appraised.

Little comment is required. The need is apparent. The OECA holds strongly to the view that down-line loading via broadcast deserves equal attention with that via cable or phone line.

5. Logistics and communications

5.1 It is recommended that the logistics of user terminal deployment be reviewed, directed to a rationalization of field operations.

An important aspect of the difficult task of deploying and re-deploying terminals among users across the province is the repair syndrome. A likely scenario: the manufacturer ships units to the CRC, the CRC sends some back for repairs and ships others to the OECA, the OECA finds some parts defective and must return them to the CRC, meanwhile re-deploying some of the operational units in the Ottawa area. Test sites chafe at not receiving promised terminals, then chafe some more when it proves difficult to orchestrate the simultaneous arrival on site of the Bell modem installer and the person installing the decoder.

5.2 It is recommended that means be found for reducing the cost of long-distance access to the data base.

The user's assessment of the utility of videotex will inevitably be coloured by severe restrictions on access to the system. Present carriage modes present high costs -- often 40 or 50 cents a minute -- to the user, who is in no position to pay them. The result is that either the user or the field trial operator must cut back on the amount of use per day, per week, per month, to a point that makes a fair test of the system impossible.

It should also be mentioned that the cost of modem installation is high, and that this technology predisposes to the immobility of terminals. To re-locate a modem is both costly and slow. Whether in the form of acoustic couplers or other, some answer should be found.

6. <u>Awareness</u>

6.1 It is recommended that the DOC establish as an important short-term objective the taking of steps to raise general awareness of the broadcast Telidon mode.

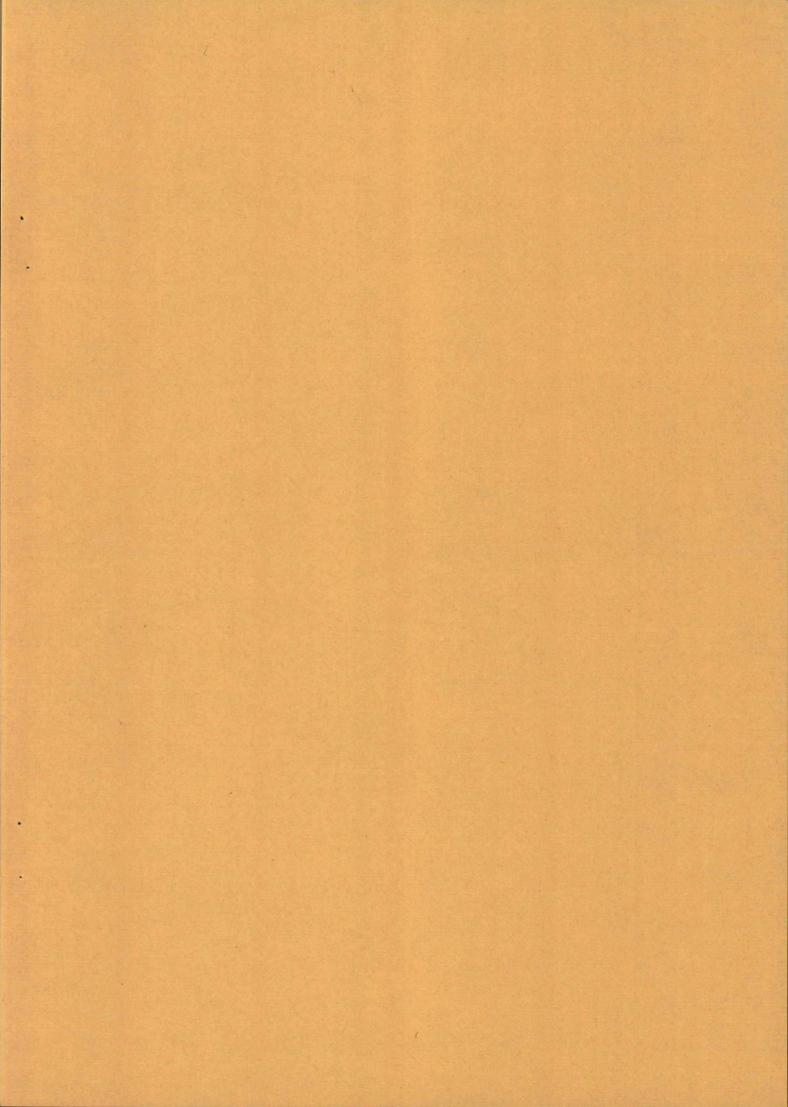
The OECA project team has found that its own perception of the importance of the broadcast mode has been reinforced by the experiences of the agencies operating user terminals in the field. The problems of cost and access associated with on-line retrieval during the early evolutionary phase of the technology have underlined the comparative advantages of the broadcast mode. Many users wish to demonstrate the technology over extended periods of time, on many occasions per week, and they find they can do this via broadcast, permitting them to be more selective in the intensive use of the interactive mode.

Moreover, special features of the broadcast mode, -transparent pages, suitability for topical display, ability to reach remote areas by satellite -- are of profound significance for educational communication. The Telidon and Education project would benefit from a wider awareness of the importance of broadcast Telidon.

6.2 It is recommended that an OECA team member be included in briefing of personnel making presentations of Telidon applications abroad.

The OECA believes that the dual-mode field trial it is engaged upon is of considerable significance for the furtherance of educational applications of Telidon anywhere in the world, and also for the wider understanding of the broadcast mode and its potential. Those promoting Telidon abroad deserve to be fully up to date on the applications under development within the framework of the Telidon and Education project. 6.3 It is recommended that the OECA, in association with one or more universities and/or colleges develop a "two-day" course or orientation process, of benefit to managerial and operational personnel in government, social service organizations, and educational institutions.

The OECA project team has over the past year developed skill and knowledge in reference to Telidon page creation procedures and technology. Hundreds of people who need to assess the level of activity required to develop applications of Telidon could be well served by organized presentations pitched especially at the level of familiarization with operational procedures.



Telidon Style Manual - Suggestions

- 1. Colour combinations
- (a) In general, we find that light backgrounds (white, cyane e.g.) diminish the breadth of line of dark text (black, dark blue) and diminish legibility whereas the reverse is emphatically not the case. Thus, dark backgrounds tend to give impact to lighter colours.
- (b) Following this general principle, we've found that a pleasing effect is created by:

cyane text	on	blue background
green "	н	black background
yellow "	u	black "
white "	u	purple "

- (c) As a generalization, white on black, while entirely legible, is aesthetically uninviting if not relieved by some colour framework. "Framed" by black panels within a colour background, white text can be attractive.
- (d) Following on the previous statement, we've found that black panels within colour backgrounds intensify the black value, and thus colour graphics placed on the black panel are also intensified. Such black panels take on a more pictorial (framed) quality when outlined by a white or cyane line (usually, a no-fill rectangle).
- (e) Intermediate-intensity colours such as red and blue, when placed on a black background, tend to be clear in outline, but subdued in impact. The majority of viewers appear to have a difficult time reading blue text on a black background. The inference may be that where the message is meant to be clear but not prominent, intermediate values can be used.
- (f) Light-on-light usually poses a problem of legibility of text. Yellow on green, for example, registers poorly. On the other hand, light-on-light is capable of introducing some subtlety in the display of graphics where large masses of colour rather than fine line, are used.
- (g) "Shadow" effects in the presentation of text offer some scope for variety of presentation and simulation of distinct colours. Following the general principle that lighter values on top of darker values display more legibly than the reverse, interesting effects can be achieved by typing red or blue text on black, making a "copy", modifying the copy's colour to something lighter, and re-positioning the copy just barely to the left and slightly above the darker text. We've found that the appearance of light blue text can be achieved in this way, using cyane on top of blue on black.

- (h) Simplicity of colour combination is generally to be preferred to the use of many colours in the display of text. Three colours may work well in combination, but if each sentence or phrase is different, the effect is cacophonous.
- (i) Size of text is another means of giving prominence to some words or phrases, for example, titles.
- (j) Relatedness of meaning can often be achieved by relatedness of colour. The word "press" in red, probably calls for the numbers to be shown in red.

2. Composition

- (a) As a generalization, the page designer should be conscious of the principle of coherence, namely, the visual grouping of distinct elements that the designer wishes the user to perceive as a "set" rather than as a jumble of unrelated items.
- (b) Applying this principle to text, the designer should not fill the screen with line after line of words and sentences -- the eye gives equal value to everything. Unlike the case of a page of print, paragraphs that cohere cannot be displayed on a 40 x 20 matrix. If therefore each sentence is to be made intelligible to the eye, it may be necessary either to separate it from the subsequent sentence as one would a paragraph in print or to present the sentences sequentially, overlaying each with the background colour, and placing each following sentence on the new background. The latter approach of course, requires the use of a wait command between these 'phased' sentences.
- (c) Again in reference to text, it is possible to introduce coherence and separation by using rectangles - either no-fill "frames" or solid backgrounds - to distinguish one grouping from another.
- (d) Another basic principle, applying to the grouping of both text and graphics, is the conscious use of negative space. The nondesigner tends to think that the areas on which no text or graphic has been placed are somehow without effect on the eye and mind, whereas these spaces can either complement or unbalance the elements the designer wants the viewer to appreciate. The designer should consider the advisability of partially filling large negative spaces that create visual imbalance, perhaps using an intermediate colour value, or some colour that appears elsewhere within the frame and requires an "echo" so to speak.

3. Editorial Style:

(a) We have noticed that excessive punctuation on a page looks unattractive. We have been experimenting with no punctuation or minimal punctuation. We also use the international time and date lines:

ie. MON 2 JAN 80 or French, LUN 2 JAN 80

Times are rendered in the 24 hour clock without colons:

ie. 0100 = 1 am, 1300 = 1 pm, 2300 = 11 pm, 2230 = 10:30 pm etc. etc.

(b) Other style ideas are underlining book titles and TV shows etc. or perhaps showing emphasis by changing colour. Thought continues about the adoption of a well known editorial style guide such as <u>The Canadian Press</u> as our standard or developing our own Telidon editorial style guide.

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INTERIM REPORT OF USER REACTION

TO TELIDON

FOR

THE OECA TELIDON FIELD TRIAL

Research Officers:

Lynette Gillis Olga Kuplowska Kay Duggan Pat Parsons

Office of Project Research, Report No. 1980 - 5 Manager, Office of Project Research: Rand Nickerson

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At the request of the Telidon Project Team, the OECA Office of Project Research conducted a preliminary evaluation of user response to Telidon. The data were acquired for this interim report through structured interviews with 16* field trial participants. The interviews were conducted to assess the kinds of problems users were experiencing with the new technology, and to assess users' perceptions of Telidon's potential in education. This report is intended as a formative evaluation; the information was collected to provide direction for the further development of Telidon's educational applications.

Technical Operation

All participants were asked what kinds of technical problems they had encountered in using Telidon. The most common problem, reported by all users, was getting on the system. Users reported getting busy signals for up to two hours. Other frequent problems:

- 1) The system froze and pages did not move.
- 2) Requested page did not appear.
- 3) Transmission was cut off.
- The "page does not exist" command appeared where page did exist.
- 5) Pages flashed by too quickly.

The following problems were reported to have occurred at some terminal sites:

*All sites where terminals were deployed and operational to date

- 1) Pages were garbled and graphics distorted
- 2) Extra letters appeared in text.
- Illegal commands appeared when correct buttons were pushed.
- 4) Program pages went into a continuous loop.
- 5) Constant "beeping" occurred.
- 6) The screen blanked.
- 7) Print sometimes appeared off the screen.
- 8) Front page would not appear unless "reset" was pressed.
- 9) "0" constantly appeared on the screen.
- 10) Graphics appeared too slowly.

<u>Using Indices</u>

The participants were also asked if they had experienced any difficulty in retrieving information and using existing indices. The most frequently mentioned problem was that user directions were inconsistent and therefore sometimes confusing. Many participants remarked that the "colon" was not used in a consistent manner. No other problems relating to indices were mentioned.

Legibility of Content

Most of the participants reported that they had no difficulty reading pages. The colors dark blue and purple, however, were reported as being more difficult than other colors to read. Some reported that the print had appeared too close to the edge of the screen. The text size may also be too small and too dense for elementary school children.

Content

Participants reported that is was too early in the field trial to evaluate or comment on the content of pages. The pages that now exist suffice for demonstration purposes. The users said they would like to see the following kinds of pages developed:

For secondary school use:

- 1) School notices
- 2) Geography lessons
- 3) Simulations
- 4) Mathematics aids
- 5) Current business and stock news
- 6) Current events
- 7) Machine-shop aids
- 8) Drafting aids

For primary school use:

- 1) Primary language programs
- 2) Provinces and capitals lessons
- 3) Primary math programs
- 4) Primary reading programs

For college and university use:

 Course-related material for classes in: finance, advertising, geography, visual design, electronics, technology, radio and television arts, and architecture

2) Current business and stock reports

- 3) Data from Statistics Canada
- 4) Travel information
- 5) Current local events
- 6) Drug information
- 7) Job offerings
- 8) Distance education course offerings
- 9) Vocational testing
- 10) College events and newsboard

For library use:

- 1) Business and stock reports
- 2) Government officials and phone numbers
- 3). Government information
- 4) Games
- 5) Consumer information
- 6) Public information that now exists in directories
- 7) Current and rapidly changing information

Uses for Telidon

In the schools, colleges, and universities, the field trial participants were primarily interested in familiarizing the students and faculty with new computer technology, Their aim at this stage in the trial was to stimulate interest in the academic community in the potential of Telidon. Many instructors are now creating pages for use in their courses, including electronics, journalism, hospitality studies, and graphic design. Libraries have conducted demonstrations with Telidon to educate the general public and are also active in page creation.

The Potential of Telidon

All participants were asked what they perceived as being the value of Telidon, and what changes or modifications Telidon would have to undergo to be of value in their professions. In most cases, participants found it difficult to comment at this time. The general consensus, however, was that the critical factor in the success of Telidon will be the development of a very large and varied data base. Most indicated they would use Telidon if it carried the content that they needed and could not obtain as easily elsewhere.

Educators in particular commented that Telidon's potential as an educational tool would be greatly enhanced if a keyboard were added, and if the system were made more interactive than at present. Some suggested a need for a printer attachment. Others remarked that Telidon would be more useful in educational settings if the user terminals were as sophisticated as the input terminals.

At the elementary school level, Telidon is seen as a potentially useful educational tool because the television screen captures the interest of children, and the movement of pages sustains their attention.

Of particular interest to both educators and librarians is Telidon's capacity to display "current," frequently changing information, such as stock and business reports and public statistics. Librarians also saw Telidon as being useful for creating an information network between libraries. Some participants in the field trial expressed concern about who will control content for Telidon. Who will decide what information is stored in the data base and on what basis will such decisions be made? Will educational programming be created on a provincial or on a school board basis? Who will create pages, individual teachers or provincial committees? Some participants perceived a strong need for policy on content-control issues.

General Reaction

In short, the participants in the field trial have been frustrated to some extent by the technical problems associated with using an experimental technology, but they were nonetheless optimistic about the potential of Telidon in education.

This potential, they seemed to suggest, will be realized once the data base is developed so that it offers a wide variety of "needed" information that cannot be obtained elsewhere as easily or at lower cost.

The participants suggested, that in the near future, time could best be spent in refining the technology and concentrating on the development of pages to serve existing needs. For the long-range planning of Telidon, policy issues concerning the control and creation of content will have to be addressed with careful analysis and planning.

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Volume II

<u>APPENDICES</u> for OECA Report on Developmental Activity Undertaken to Support Inter-Agency Exploration of Telidon in Education

- 1. News/Promotional Releases
 - -- Telidon and Education Update, Feb/80
 - -- Release re Broadcast Telidon
 - -- The OECA and Telidon, Project description
 - -- Telidon and Education Update, July/79
- 2. Papers Presented in Support of Promotional Objectives
 - -- Telidon, A New Medium?
 - -- Telidon: An Educated Guess
 - -- Telidon and Education in Canada
 - -- Telidon, OECA and Public Libraries
- 3. Summary Records of Liaison Meetings and Conferences
 - -- Representative records re schools, colleges, universities, libraries
 - -- Sample conference and trip reports
- 4. Documents Supporting Participation/Operations of Consortium Members
 - -- Principles of Agreement
 - -- Logistics
 - -- Page creation
- 5. Feed-back on System Components
 - -- Functionality of IPS units
 - -- User access
 - -- Teletext



REPORT ON DEVELOPMENTAL ACTIVITY UNDERTAKEN TO SUPPORT INTER-AGENCY EXPLORATION OF TELIDON IN EDUCATION

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