SUMMARY RECORD OF THE ANIK-B USERS MEETING OTTAWA, ONTARIO October 28, 1981

(1) /Anik-B Users Meeting/

(2) SUMMARY RECORD

of the

ANIK-B USERS MEETING

OTTAWA, ONTARIO

28 OCTOBER 1981

Coordinated and Prepared by

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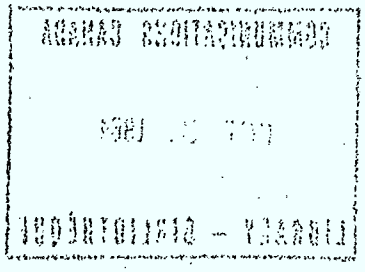

TABLE OF CONTENTS

TABLE OF CONTENTS

DEPARTMENT OF COMMUNICATIONS
OVERVIEW OF USERS MEETING

W.T. KERR
ANIK-B Project Manager
Department of Communications

OVERVIEW OF THE ANIK-B USERS MEETING

The second meeting of the ANIK-B Users was held on 28 October 1981 at the National Library and Public Archives Building in Ottawa, Ontario. The general purpose of the meeting was to exchange information and ideas concerning the ANIK-B Communications Program, learn of the progress of the individual pilot projects and discuss future plans. A copy of all written documentation provided by the Users at the meeting or later forwarded to the Department for this summary record is included. This material appears in different formats including transcripts of the presentations made at the meeting, handouts, hardcopies of viewgraphs and overviews prepared by the Department. An attendee and distribution list of this summary record is appended.

A major part of the day was devoted to progress reports on each of the pilot projects presented by representatives of each project. Reports were made by representatives of all but three projects, the exceptions being, CBC (Program Delivery Pilot Project West), Manitoba Telephone System (Project IDA Trial) and Dome Petroleum Limited. The latter was however covered by a written report.

A panel chaired by R.W. Breithaupt, Director, Communications Satellite Program and members J.D. Palmer, ANIK-B Program Manager and N.G. Davies, Director, Space Communications Program Office, (SCOPO) commented on the general concept of Phase III and technology development associated with further service development. A general discussion followed.

A second panel was chaired by B.C. Blevis, Director General Space Technology and Applications, with members R. Zeitoun, Manager, Policy and Planning, Canadian Radio-Television and Telecommunications Commission, C. Webster, Vice-President, Engineering, Canadian National Telecommunications, B. Bonneau, Manager, Carrier Relations Division, Telesat Canada, R. Montgomery, Director, Satellite Services Development, Trans-Canada Telephone Systems and D. Rainboth, Director, Extension of Services Policy, Broadcasting and Social Policy Branch of the Department of Communiations. The panel addressed the issues concerning the transfer of services to ANIK-C, and the availability and cost of these services. A general discussion followed.

At the end of the meeting, N.G. Davies, Director SCOPO, observed that there probably would not be a need for a further meeting of this type. He took the opportunity to thank all the participants who had conducted projects throughout the ANIK-B program.

The Chairman of the meeting, W.T. Kerr, officially closed the meeting at 5:00 P.M., thanking all attendees for their participation and co-operation.

A reception, co-hosted by the Department of Communications, Telesat, Trans - Canada Telephone Systems and CNCP Telecommunications, was held immediately following the meeting.

28 OCTOBER 1981

OTTAWA, ONTARIO

AGENDA

Time	Item	Speaker(s)
0830 - 0900	1. Registration	
0900 - 0905	2. Meeting Convenes	Chairman
0905 - 0915	3. Welcome	Department of Communications
0915 - 0920	4. Meeting Arrangements	Chairman
0920 -	5. Project Reports	
0922 - 0932	2B-1E Program Delivery Pilot Project (East)	Ontario Educational Communications Authority
0934 - 0944	2B-1E Program Delivery Pilot Project (West)	Canadian Broadcasting Corporation
0946 - 0956	2B-1E Program Delivery Pilot Project (West)	British Columbia Television Broadcasting System Ltd.
0958 - 1008	2B-2 Satellite News Gathering	Canadian Broadcasting Corporation
1008 - 1030	Coffee	
	5. Project Reports (Continued)	
1030 - 1040	2C-2E The Inukshuk Project	Inuit Tapirisat of Canada
1042 - 1052	2C-3E Project Naalakvik II	Taqramiut Nipingat Incorporated
1054 - 1104	2E-1E Knowledge Network of the West	Knowledge Network
1106 - 1116	2E-3E Tele-Education Project	Ministry of Education of Quebec
1118 - 1128	2E-5E Alberta Government	Alberta Educational Communications Corporation
1130 - 1140	2H-1E Telemedicine Project	Memorial University of Newfoundland

Time	Item		Speaker(s)
	5. Project Reports (continued)		
1142 - 1152	2I-1	Development of Petroleum Industry Satellite System Standards	Canadian Petroleum Association
1154 - 1204	2P-1E	Multi-Point Multi-purpose Satellite Network	Ontario Ministry of Government Services
1204 - 1315	Lunch		
1315 - 1325	2T-1E	Evaluation of a 90 MBit Digital Link	Telesat/Trans-Canada Telephone System
1327 - 1337	2T-2E	SLIM TDMA Project	Department of Communications/ CNCP Telecommunications
1339 - 1349	2T-3E	Phase Coherent Long Baseline Interferometer for Geophysical Applications	University of Toronto
1351 - 1356	2D-1	Trans-Canada Amateur Radio Packet Network	Canadian Amateur Radio Federation
1358 - 1403	2D-2	Evaluation of Digital System Performance	University of Ottawa
1405 - 1410	2D-3	Australian DOMSAT Support Activity	Department of Communications
1412 - 1417	2D-4	A Portée de Voix	Association Canadienne d'éducation de Langue Française
1419 - 1424	2A-1E	Evaluation of a Satellite TVRO terminal for use on board drillships	Dome Petroleum Limited
1426 - 1431	2A-2E	Project IDA Trial	Manitoba Telephone System
1433 - 1438	2A-3	Educational Delivery System	Stoney Mountain Institution
1440 - 1445	Review of projects not reporting		Chairman
1447 - 1515	6. ANIK-B Phase III		Panel
1515 - 1535	Coffee		
1535 - 1605	7. Transfer of Users from ANIK-B to ANIK-C		Panel
1607 - 1655	8 Plenary - questions & answers		Panel
1655 - 1700	9. Closing remarks		Chairman

OPENING REMARKS

C.A. Franklin
Acting/Assistant Deputy Minister
Space Program

OPENING ADDRESS BY C.A. FRANKLIN
ACTING/ASSISTANT DEPUTY MINISTRY, SPACE PROGRAM
DEPARTMENT OF COMMUNICATIONS
AT ANIK-B USERS MEETING
WEDNESDAY, 28 OCTOBER 1981

On behalf of Alex Curran it is a great pleasure for me to welcome you to this second ANIK-B Users Meeting. You are of course here not only to exchange information on project activity but to discuss future plans. Before turning to the future, let me briefly review where we have come from and where we are now.

ANIK-B was launched in December 1978 and pilot project operations began on schedule on 1 April 1979. Phase I lasted for two years, during which period many of the field and broadcast services demonstrated on HERMES were put to the test of extended service trials. Of particular note was the inauguration by OECA in September 1980 of direct broadcasting by satellite to homes and small communities, and by LaSETTE which instituted the worlds' first regular commercial service at 14/12 GHz to cable head-ends in Quebec.

As a result of the success of Phase I, approval was received to undertake further trials for a period of 19 months, terminating in September 1982. In this second phase we have undertaken new projects, continued trials in broadcasting and tele-education with increasing emphasis on cost recovery, and have continued the LaSETTE commercial service in Quebec. I think it is probably now fair to say the DOC's objectives in fostering the development of broadcast services at 14/12 GHz will have been fully achieved by the end of Phase II.

The question now is what happens next. Clearly DOC has an obligation to those experimenters who foresee transitions to regular commercial service on ANIK-C in late 1982. However, there are some hard questions to answer regarding the continuation of the Program into a third phase. Do we have enough new ideas? Do we continue projects that are still not ready for transfer to commercial service? Furthermore we must subject all proposals to the increasingly stringent cost benefit analyses and evaluation that virtually all government programs are now quite rightly being subjected to, particularly in the current extremely difficult fiscal climate. On this point I would like to express my appreciation for the excellent responses we received from you in answer to the questionaires which were sent out two months ago. These questionaires are part of an overall evaluation which is being carried out on the program and which we expect to complete by the end of this year.

The Department is planning to apply the ANIK-B service development model to a new program called MSAT, for satellite service to small mobile terminals. The government is presently considering the approval of further feasibility studies of such a satellite system. If approved, the MSAT program would combine both HERMES and ANIK-B experiments, trials, and preoperational service in a single 7 year mission.

Finally I would like to conclude by saying how pleased we are with the enthusiastic participation of all ANIK-B users. This has been an essential ingredient in making this a successful program.

I will now turn the meeting back to Terry Kerr and I hope that in the discussions which follow there will be a thorough, frank and useful exchange of views. Thank you.

2B-1E PROGRAM DELIVERY PILOT PROJECT (EAST)

Presentation by:

A.R. MacGregor
Assistant Director
Distribution Services
TVOntario

2B-1E PROGRAM DELIVERY PILOT PROJECT (EAST)

Project Title: Northern Ontario Hybrid
Direct Broadcast Operational Trial

Project Managers: P. Bowers
R. Bulger
A. MacGregor

This project has been sponsored by the Ontario Ministries of Transportation and Communications, Northern Affairs, Culture and Recreation along with the Ontario Educational Communications Authority, now better known as TVOntario. The project was managed by TVO; and we would at this time acknowledge the contribution, and assistance of the Department of Communication through the CRC in Ottawa and the DOC Regional Offices who very ably assisted in the installation and maintenance of the field equipment.

TVOntario had as its objectives: to raise the awareness of the potential value of delivering TVOntario programs and educational services via satellite to Northern Ontario; to gain operational experience; to examine the demand for alternative TV services in the remote areas of Northern Ontario; to examine the need for contextualization of educational programs when delivered to isolated and remote areas; and to examine the subjective acceptability of varying the technical signal quality in remote areas. A review of the project to date may be useful.

During late 1979 and early 1980, 42 1.2M and 1.8M LCET's as well as 4 3M TVROs were installed at homes, cable companies, schools, libraries, a low power television repeater, a prison, a motel and some MATV systems.

In July of 1980 an uplink was installed on the 20th floor of the office building occupied by TVOntario, thus bypassing the rather complicated system of microwaving the signal to Ottawa, broadcasting it on CH24 from Camp Fortune, receiving it off-air at Shirley Bay and uplinking to the satellite from the 9M terminal.

At the time of the first User's meeting in 1980, the evaluation of PDPP was well underway and the information reported here was compiled from three separate investigations. In the first, in-depth interviews were conducted with the twenty- six mid-northern families participating in the field trials. The interviews focussed on the participant's perception of the effects of the new television service on their work, leisure habits, family life, and community involvement.

In the second, a mail survey was conducted with representative samples from the underserved mid-north and from southern Ontario. The survey focussed on attitudes to the expansion of broadcast service, including the demand for different kinds of programming and people's willingness to pay for services.

In the third study, the PEACE computerized evaluation system was used to compare the program preferences of people in the mid-north with residents of the south. Precise measurements of program appeal were obtained for sixteen categories of programming.

The following are among the important findings of the three studies:

Social Impact

1. Northern residents, as a group, do not believe that an expansion of television services in their area will have a universal or far-reaching impact on their way of life or pace of life. They may view slightly more television, but the impct of extended service was highly individualistic.

2. Northern residents however, do perceive extended television services as contributing to the quality of life. From their perspective, a greater availability of television would reinforce ties between North and South, keep them better informed, stimulate interest in national affairs, and add to their enjoyment of life.

3. Northern residents consider television's capacity to inform as important as its ability to entertain.

4. Both northern and southern residents perceive that any social impact of expanded television services would be most strongly felt by children. Positive and negative aspects are documented.

Program Demand

5. There is considerable overlap in programming demands between the mid-north and the south. There is strong demand for traditional popular broadcasting, but also for special-interest narrowcast programming.

6. The northern audience can be distinguished from the southern in its greater demand for children's programming, local news, movies, and situation comedies. The southern audience expressed a greater need for cultural programming.

7. The northern French differ from both the English groups in their greater demand for information programs.

Program Preference

8. There is striking similarity in program appeal between north and south. Appeal does not vary greatly with sex or education or age, and two independent appeal measures are highly correlated. This implies that appeal is more a function of people's experience with television than of any demographic variables.

Complete copies of the report can be obtained from:

TVOntario
P.O. Box 200, Stn. Q
Toronto, Ontario
M4T 2T1
Attn: A.R. MacGregor

Further to the original goals, the DOC issued an Interim Evaluation Report by C. Billowes in June 1980, and a DOC sponsored experiment conducted by Behavioral Research Associates in collaboration with TVOntario in which participants were subjected to various levels of fading on a simulated direct broadcasting satellite circuit. Both these reports are availabile from the DOC.

TVOntario is now well underway through the Phase II of the project. A major changeover of all the reflectors has been necessitated by the requirements to share a transponder in the East. This has required us to replace all the 1.2M, 1.8M, and 3.0M reflectors with 1.8M, 3.0M, and 4.5M reflectors respectively. The changeover has not been without problems and still is underway.

Future Plans

TVOntario has been making concrete plans to roll over its terrestrial microwave distribution system to distribution via ANIK-C; no provision has been made to feed new transmitters via terrestrial microwave.

In addition, the Ontario Ministry of Northern Affairs has announced a program of grants to purchase TVRO and Low Power Television Repeaters to distribute TVOntario via the interim ANIK-B project and the future ANIK-C.

2B-1E PROGRAM DELIVERY PILOT PROJECT (WEST)

Presentation by:

T. Negoro, P. Eng.
Vice-President, Engineering
British Columbia Television Broadcasting System Ltd.

2B-1E PROGRAM DELIVERY PILOT PROJECT (WEST)

Project Title: Broadcast Program Distribution - BCTV
Phase II, ANIK-B Project

Project Sponsor(s): Department of Communications (DOC)
British Columbia Television Broadcasting System Ltd. (BCTV)
Province of British Columbia (B.C. Gov't)
Yukon Territory (Y.T. Gov't)
Northwest Territories (NWT Gov't)

Project Managers: T. Kerr (DOC Ottawa)
J. Thwaites (DOC Vancouver)
T. Negoro (BCTV)

Project Objectives: Phase II of the ANIK-B project is an extension of the stated objectives outlined at the ANIK-B Users Meeting, June 5, 1980, namely:

1) To demonstrate, evaluate, and gain field experience with a direct-to-home and small community program delivery service, using the ANIK-B Satellite 14/12 GHz transponders.

2) To provide a prototype testing ground and a small initial market to help stimulate the industrial sector to develop a line of internationally competitive products for this service.

3) To provide information to the Government which will contribute to policy development and plans respecting the future operational use of broadcasting satellites.

4) To provide information to the various agencies, institutions and corporations interested in satellite broadcasting to help them formulate plans for their future activities in this field.

Though unstated, on the West Beam, there is an objective, a technical one, which makes this pilot project unique. The objective is to test the transmission of two TV signals (two video and two audio) over one transponder on the satellite. This would reduce the transponder rental cost proportionately.

Outline of Actitivies

BCTV's participation in the Program Delivery Pilot Project (PDPP) commenced December 14th, 1979. The signal covers the West footprint of ANIK-B covering British Columbia, Yukon Territory, and the western portion of the Northwest Territories. The television signal is the full broadcast programming of the "Interior Feed" of BCTV, an average of 22 hours per day, which includes sporting events "blacked out" in the Lower Mainland. Details on the selection of receiver locations were discussed at the previous Users' Meeting, however, appended to this report is a listing of the Low Cost Earth Terminal (LCET) reception locations.

Again, to recapitulate, the unique aspect of the PDPP on the West beam was the tranmission of two television signals, one BCTV and the other CBC, over one satellite transponder. This is accomplished by frequency division multiple access, in that two separate uplink transmitters operate at ±15 MHz from the centre of the channel. The Effective Isotropic Radiated Power (EIRP) is kept balanced in order that the 20 watts of power of the retransmitted signal from ANIK-B is divided equally between the two signals.

Originally, the uplink units were two Television Transmit (TVT) trailers, both co-located on the parking lot at BCTV. In May, 1980, to test the access to the satellite by uplinks at different locations, a portable TVT hut unit was installed at the CBC studio building, for uplinking their signal, and no undue effect was found to the service to the LCET's.

Subsequent to the previous Users Meeting, the timetable for ANIK-B experiments called for the termination of some and commencement of others. In juggling the facilities to accommodate these, the DOC decided that the television signal of the Knowledge Network (KNOW) would share the output power on the West Beam. Therefore on August 31st, 1980, the signals were being retransmitted at approximately a third of the power. Degradation of signal was noticeable at many of the LCET locations, however, a more annoying consequence was the effect on receivers due to on-board antenna switching that was taking place as a result of time sharing of the transponder amongst various educational participants; the receivers would "hunt" for a signal during the momentary shut-down, and the program that came on was not necessarily the one that was being watched.

In March, 1981, as we are all aware, phase II of the ANIK-B experiment commenced. Technically, there was no change, but on the monetary side, there was a shift from an experimental to an operational mode. BCTV made application to participate for the duration of Phase II, under certain conditions.

Since other experiments on ANIK-B called for the transportable TVT uplink trailer, it was decided that upon removal of the trailer from the BCTV site, BCTV would terminate further participation in the PDPP. The date of October 10th was set. However, literally at the last minute, the Minister's office intervened and requested BCTV to continue with its service until December 31st. BCTV is co-operating with the Department in this respect.

It would be appropriate to cover some outstanding items from the report of the previous Users Meeting of June, 1980.

Reliability of the TVT uplink trailer, under continuous use, which is the case of the BCTV signal, turned out to be twenty-four hours a day, was amazingly high. This trailer, in its twenty-two months of operation, suffered only one failure of a power transformer for an outage of less than ten days. Other out ages of short duration were attributable to external conditions. The satellite itself had outages of one-half hour duration early this month.

In terms of feedback to assess the quality of reception and to correlate anomalies with known transmission factors, such as climatic conditions, BCTV is very disappointed that the initial enthusiasm was not followed through by the responsible parties.

Observations

It is of interest that, subsequent to Users Meeting of last June, various developments and events in terms of the use of satellites for broadcasting in Canada have taken place. We mentioned in our report that the special (Therrien) committee of the Canadian Radio-television and Telecommuications Commission (CRTC) was conducting hearings to find a solution to the need for varied television service to the remote and Northern areas of Canada. That committee submitted its report and the CRTC followed its recommendation by calling for applications, by holding a Public Hearing, and by rendering a decision that favored an application by Canadian Satellite Communications Inc. (CANCOM), based on the use of the 4/6 GHz transmission as opposed to competing applications on 12/14 GHz. CANCOM's application was approved April 14, 1981, and true to their commitment to the CRTC, ninety days after the decision, the signals were available off the satellite, ANIK-A 2/3, on July 15th. The CRTC is currently considering applications for distribution systems which would carry these signals. BCTV is a participant in CANCOM.

Future Outlook

Referring back to the Summary Record of the ANIK-B Users Meeting of last June, we note many references to the terminology "Direct Broadcast Satellite" (DBS). And carrying over to the agenda of this meeting, we find the topic "Transfer of Users from ANIK-B to ANIK-C". Our involvement in the ANIK-B experiment has given us an appreciation of some of the pitfalls we see in these two subjects.

At the outset, we wish to make it very clear that BCTV has worked with the Canadian Association of Broadcasters (CAB) in their preparation of the Response to DOC's Discussion Paper Towards the Development of Canadian Proposals for the 1983 Region 2 Broadcasting Satellite Planning Conference,'83 RARC. BCTV supports the position of the CAB, and the points stated here are the ones BCTV wishes to emphasize.

Direct Broadcast Satellites (DBS) are inevitable and will bring further competition and audience fragmentation from the U.S. To a broadcaster, the defence for the principles of the Broadcasting Act must, amongst other things, offer a technically compatible alternative to foreign DBS, to compete in our own country against foreign DBS services.

It is known that the Americans are planning the concept of high-powered transponders to lower the cost of ground receiving equipment. The inexpensive, small and simple-to-operate DBS receivers are essential to the success of any service, foreign or domestic. Therefore, the Canadian system, in planning, must have parity with the U.S. in technical compatibility as well as equivalence of operating parameters. Because the U.S. is such a huge market, it can support a unique technical system if it so chooses. Since U.S. broadcasting services have always been attractive to Canadians, equipment to receive U.S. signals will always abound in this country, both in home receivers and broadcast playback equipment. It is inconceivable that Canadian standards for broadcast signals would be different from the U.S., for example, the NTSC system for television. Unless Canadian standards are exactly equivalent to U.S. standards, Canadian broadcasters are faced with the impossible task of trying to serve the Canadian audience that may not be equipped to receive that signal. As for operating parameters, we are well aware of the disadvantaged position of private broadcasters of Canada in the 1930's when government policy restricted power levels of AM stations to one kilowatt, while American broadcasters were utilizing higher power.

The consequences of technical incompatibility with the U.S. are disastrous. The higher power proposed in the U.S. DBS systems permits use of less sophisticated, less costly receivers. These two factors, when combined with the large potential DBS receiver market, will permit mass production for

rock-bottom retail price. Canadians, with their desire to watch U.S. programs, will find these more attractive, even with import duties, over domestic products. Strike one. If Canada were to implement a domestic DBS service utilizing, say, one-quarter the satellite transmitting power of a U.S. service, the Canadian receiving dish would have to be two to three times larger than the planned U.S. model. The additional cost of these units (not only because of extra material cost, but by comparison to the U.S., lower quantity production run) would place them in an inferior competitive position. Strike two. Furthermore, larger dishes are considerably less attractive to potential purchasers because they are more conspicuous and harder to mount. Strike three.

If only large dishes are available domestically, prospective Canadian viewers will quite probably decide to purchase cheaper and small imported units, leaving any Canadian broadcasting using a low-power domestic DBS satellite with the dismal reality that:

1) He is unable to provide his signal to Canadian viewers with U.S. made receivers because their receiving dishes are too small. Strike four.

2) He cannot take advantage of any U.S. spillover, for the same reason. Strike five.

3) His U.S. DBS competitors have no trouble whatsoever in serving his Canadian audience. End of ball game.

Therefore, Canada cannot afford to accept domestic DBS standards different from those which will be in common use in other countries, especially the U.S.

Transfer from ANIK-B to ANIK-C

For many of the participants of the ANIK-B program, transfer to ANIK-C will have little effect. As a broadcaster in a competitive field, BCTV would have grave reservations about shifting from an experimental Program Delivery Pilot Project to an operational DBS service on ANIK-C. ANIK-C will have operating parameters of low-power, similar to ANIK-B. ANIK-C has been optimized to provide fixed services (data and message) between the major urban centres.

ANIK-C does not have the coverage pattern necessary to cover the northern reaches of this country. Even with the 0.25° tilt advocated by Telesat, the coverage per beam would not be comparable to that of ANIK-B. Within the 12 GHz band of operation, ANIK-C will operate at 11.7 to 12.2 GHz, while the U.S. DBS service will fit the space frequency allocation of 12.2 to 12.7 GHz. This could lead to incompatibility of receivers. Because of the requirement for larger dish size to receive

signals off ANIK-C, as compared to other DBS signals which will become available as early as 1983, the unit cost of the receivers capable of receiving the ANIK-C signal would cost more, and could not benefit from the cost reduction of long-term mass production, due to the lack of growth (or rather, shrinking) market.

In terms of program delivery, ANIK-C definitely has possibilities for replacement of program microwave links and of some broadcast services such as educational-TV or pay-TV targeted to southern areas, but this design should not be accepted as a Canadian standard for a true DBS system.

The subject matter of advocacy for DBS is slightly off target at this meeting, however, the experience gained by BCTV in its participation in the ANIK-B experimental project, and the concern broadcasters will have to meet in future technological developments have made it imperative that the broadcaster's viewpoint be raised.

LCET LOCATIONS

Yukon

1)	Whitehorse	Cable System
2)	Eagle Plains	
3)	Ross River	
4)	Stewart Crossing	
5)	Watson Lake	
6)	Johnsons Crossing	

Northerwest Territories

1)	Yellowknife	Cable System
2)	Norman Wells	
3)	Inuvik	
4)	Fort Smith	
5)	Port Radium	
6)	Fort Simpson	
7)	Talston River Dam	
8)	Fort Providence	

British Columbia

1)	Cassiar	
2)	Dease Lake	
3)	Telegraph Creek	
4)	Atlin	
5)	Tatla Lake	
6)	Anahim	
7)	Hazelton	
8)	Stewart	
9)	Courtenay	CBC rebroadcast feed
10)	Bull Harbour	
11)	Strathcona Lodge	
12)	Juskatla	
13)	Gutah Camp	
14)	Meadow Creek	
15)	Mackenzie	
16)	Bella Bella	
17)	Grand Forks	
18)	Blue River	
19)	Premier Lake	

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2B-2 SATELLITE NEWS GATHERING

- Canadian Broadcasting Corporation -

Presentation by:

Bill Bolt
CBC-SNG Co-ordinator

2B-2 SATELLITE NEWS GATHERING

The 14/12 GHz SNG (Satellite News Gathering) Program is an experimental project with DOC and the CBC as partners. It was begun in 1977 when Jim Landsburg, Project Planning Manager of CBC, made a presentation to Cabinet on behalf of the CBC.

It's purpose is to investigate the feasibility of a transportable small antenna transmitter/receiver, which would enable the CBC News crews to telecast from most areas in Southern Canada unhampered by the absence of power lines and/or communication lines.

Within the first three weeks of use in August, this year, the CBC's French Network had originated items and programs from Angonish, N.S., Quebec City, the Montreal Area and Val d'Or, Quebec.

On October 6, an English Network team took the Unit to Sherbrooke, N.S.(90 miles from Halifax) for inserts on the Nova Scotia Election.

All of these originations were from points where there was a considerable distance between the point where the news was happening and the nearest CBC location. The usual way of originating from these areas would be to record on video tape or film, then take the recording medium back to the CBC Centre and reproduce them or to book, sometimes weeks in advance, microwave facilities which might have to be constructed. These methods, of course, are time-consuming and costly.

The SNG method, although not fully tested in all conditions, shows promise of becoming the broadcasters' dream of being able to be used much in the manner that a personal dictograph unit or audio cassette recorder is used.

For fast-breaking news in seemingly awkward locations, without the use of wires, the Satellite News Gathering operation could become a valuable tool for broadcasters and others.

The main obstacle to the CBC's part in the experiment, at present, is the very narrow window size, caused by the elimination of available transponders and the resulting proportionately-large number of users. It would appear that this particular experiment (which could lead to other significant users' use) is seriously handicapping the development. At present, the CBC has used only part of the total package. The reverse audio and communications channels have not been able to

be put to use, because of the nature of the programs that have to date required the SNG Unit. Also, rain and cold weather have yet to be experienced; valuable information concerning the design and development of newer SNG units which would be based on the present unit's performance during inclement weather is not available at present.

It is hoped that the users who presently are simply distributing information may be persuaded to allow more time to our development. However, it's probably not possible to arrange swaps in time and, so, we'll have to try and fulfill our part of the experiment in spite of unexpectedly poor performance of equipment and seemingly poor judgement in organizing the large numbers of users.

2C-2E THE INUKSHUK PROJECT

- Inuit Tapirisat of Canada -

Presentation by:

M. Martin
Operations Manager

2C-2E INUIT TAPIRISAT OF CANADA

Project Title: The Inukshuk Project

Project Operator: M. Martin

This report is an update from the one presented to the ANIK-B Users meeting of last year. Since the Inukshuk Project has been terminated we shall be presenting our Project Evaluation Report as a wrap up. In the meantime this report will touch upon the highpoints of the final months of Inukshuk.

Background

From its inception of 1971 the Inuit Tapirisat of Canada (ITC) held, as one of its primary objectives, the improvement of communications in the Inuit homeland.

In 1977 ITC became aware of the ANIK-B Communications Program. The ANIK-B satellite provided the technical capability for an interactive North-to-North broadcast network. ITC researched the study which clarified the relationship between ANIK-B technology and northern communications needs, and outlined the conditions under which a pilot project could test the relative merits of different communications systems for Inuit communities. The Department of Communications accepted the subsequent ITC project proposal and Treasury Board approved the three-year funding through the Department of Indian and Northern Affairs.

The Inukshuk Project included an experimental broadcast phase which linked six communities in three arctic regions (with different time zones and dialects) into an interactive two-way audio, one-way video network; a widespread videotape distribution system; and the provision of Inuit-language material for both systems through training and production programs.

THE PROJECT:

Inukshuk was a phased project with each phase having specific goals. The Planning and Training phase ran from November 1st, 1978 to March 31st, 1979. Training continued into the Training and Production phase from April 1st, 1979 to May 31st, 1980. The Pre-test phase ran from June 1st, 1980 to September 30th, 1980, and the Operation phase from October 1st, 1980 to May 15th, 1981. The final segment, the Wrap-up phase began on May 15th. and will end on November 1st, 1981 when all reports and evaluations are finally in and presented to the sponsoring agencies.

During the operational phase, the project broadcast some 16.5 hours of programming per week, much of it interactive between communities and community groups.

Through the television effort some 107 different titles were placed in circulation over a video tape distribution system throughout northern communities. In addition many of these tapes were distributed to groups in the south who thereby came to know the Inuit and their culture - and their problems - just a little better.

Twenty-six people worked with the Inukshuk Project on a permanent basis, all of whom learned by doing as the project was implemented. Twenty-two received training in organized programs and many others attended workshops and sessions for staff, volunteers, and community assistance. Staff were given the opportunity for further development of media and organizational skills through specific work with the project.

The interactive network provided a unique opportunity for local organizations to meet without travelling. It allowed many groups the only opportunity they would ever have to meet since it eliminiated the need for expensive travel and much organizational work.

More importantly, it proved beyond any doubt the capability of northern people to plan, organize and run their own television network, in their own language, and according to their own cultural values. It established the credibility of the Inuk television producer.

THE BENEFITS:

The primary objectives of the project were met. The ITC and, so far as we can determine, everyone else involved in the project, are satisfied with the results. The feasibility of an Inuktitut television network, operated by Inuit for Inuit, was proven. The federal government came through with further interim funding, through one source or another, which has given everyone concerned a great boost of morale.

The spin-off benefits were too numerous for detailed elaboration. They ranged everywhere from the opportunity for hands-on experience in a new technology which will without doubt lead on to several careers in broadcasting, to technological testing and experimentation - both on the scientific and artistic level; to a whole range of educational, social and cultural advantages, not to mention the self-actualization of the numerous individuals who have discovered some hidden strengths within themselves as a result of their involvement in Inukshuk.

The Inukshuk Evlauation Report deals with the subject of accrued benefits at some length, and will make valuable reading for anyone wishing to pursue this line of enquiry. There is no time here to examine more of them, but there is one which leads directly into our present Inuit Broadcasting Corporation that bears repeating.

The question was posed at the beginning of the project as to the economic viability of an Inuit television broadcasting service. The report notes:

> "The Inukshuk Project indicated that the economic viability of an Inuit broadcasting system depended upon a source of consistent long-term funding. Revenues from program sales, production contracts and advertising cannot be expected to support an Inuit network. Pay TV arrangements might partially support local productions in one or two communities, but the application of Pay TV revenue to Inuit broadcasting costs have been rejected by CRTC. Funding for an Inuktitut network is feasible as part of Inuit Land Claims negotiations, specified by ITC. This arrangement has made the Inuit Broadcasting Corporation economically viable."

In June of 1981 the operational phase of Inukshuk was completed. We have been working ever since then on the establishment of a permanent broadcasting organization. In some respects the work has been made easy, infinitely easier than it might otherwise have been, by the enormous good will of so many people who have supported, advised and assisted us in getting established. This good will has also been manifested by the degree of support and co-operation forthcoming from Federal and Territorial politicians and civil servants, not to mention members of the general public who have lent us their voices and signatures in pressing our cause. In particular the officials of the Department of Indian and Northern Affairs, and the Department of Communications have given us every kind of consideration in making sure that the project worked. For this I have been asked by our staff to let them know publicly that their efforts are genuinely appreciated.

Politicians and senior civil servants have been no less supportive. On July 5th the Minister of Indian and Northern Affairs announced the approval of 3.9 million dollars for the further funding - on an interim basis - of the new Inuit Broadcasting Corporation and the Quebec group TNI.

While I usually try to avoid stressing the negative I wish I could offer the same words of praise for the private sector. I understand our new President of TNI, Mr. Padlayat, will have something more to say about this, but I feel it is necessary to comment on the lack of co-operation we have suffered at the hands

of TCTS, CNCP and Telesat Canada. These companies have been something short of helpful. I mention this for the benefit of those who are attending here today representing these corporations. I hope they will be concerned enough to seek out the root of this disinterest and take steps to have it corrected. I feel certain that it does not reflect those corporations' public policies, but is somehow connected with problems inherent within the bureaucracies of these organizations.

At any rate, we are now well and truly launched as an independent organization. The CRTC came through with our broadcast licence in record time. The CBC has put their staff at our disposal to open lines of communications and effect an efficient marrying up of the three organizations - ourselves and TNI - in order to get onto their satellite system. Uplinking from a northern location, probably Frobisher Bay, using our own equipment and piggy-backing on the CBC transponder, we hope to be into full scale broadcasting by mid-summer 1982. In the interim we will be sending programs to Toronto for insertion into the CBC system at that point for broadcast in the same time slot, i.e. after the CBC closes down their programming for the day. We have been allotted one hour a day, five days a week - excluding Thursdays and Fridays. We are also discussing weekend daytime slots for other programming such as children's shows.

This arrangement is not a totally satisfactory one, but it is a start, and a good start. We will have time during the interim funding period to get our production teams trained properly and the bugs cleared out of the systems. What we are hoping for eventually is to acquire a part of a dedicated northern satellite channel, to be shared with CBC North when the new satellite goes up. This is, for the moment, in the talking stages of planning for our permanent system.

We continue to operate the system more or less along the lines of Inukshuk, although this will probably begin to change rapidly now as the pressures of the new system begin to make themselves felt. We have production centres in Baker Lake and Frobisher Bay - the two major ones. There are smaller units in Cambridge Bay, Eskimo Point and Igloolik. The unit at Pond Inlet, which was really a back-up for Pond Inlet Community (PIC) TV's operation will be phased out and the equipment moved to some other location. This was made possible by the fact that PIC TV will be entering into a full affiliation agreement with us for television production and already have studio facilities there. Up to this point we have no production units in either Labrador or the Western Arctic - although the system anticipates their inclusion at some later date. Altogether we have 20 people on staff with five vacancies to be filled.

Our Board of Governors is comprised of representatives of each of the five regions as represented by regional Inuit associations. All but the association from the Western Arctic - the Committee for Original Peoples Entitlement (COPE) have taken their seats on the Board. Represented are the Labrador Inuit Association and their counterparts from Baffin, Quebec, Keewatin, and Kitikmeot (Central Arctic). In addition there are three other seats on the Board for members at large.

What makes this network different from the Inukshuk one is that we will be utilizing the CBC TVROs and local transmitters rather than those supplied by DOC. Therefore, wherever the CBC is received, IBC will be received also. The same can be said of course for those TVROs owned by the Government of the Northwest Territories. There is one wrinkle. We will be carried on the CBC channel "B" only which is mainly the eastern Arctic. The communities of the Western Arctic who are now on Channel "C" will be given the option to switch to channel "B" after the network changes over to the IBC during that daily time period. But it is strictly a local decision.

To end on a clear note I should point out that while we are grateful for the money granted by the federal government to establish IBC it does not, by any means, cover the entire cost of the operation if we are to properly fulfill our mandate. We estimate that we will need at least another million dollars over the life of the project, which will have to come from the private sector. We now have a major fund raising campaign to mount. I am confident that if the technical people can keep us running, our staff can produce enough quality programming to maintain our credibility. It is then up to the good will of our corporate citizens and philanthropic institutions to make the Inuit Broadcasting Corporation work. We believe that it will become a significant part of the national fabric of Canada.

2C-3E NAALAKVIK II TELEVISION PROJECT

- Taqramiut Nipingat Incorporation -
(TNI)

Presentation by:

Josepi Padlayat
Director
Taqramiut Nipingat Incorporated

Project Title: Naalakvik II Television Project

Project Director: Josephi Padlayat

In the first week of June, 1980 I stood here to make a brief presentation at the ANIK-B Users meeting. Many of you who are here today were at that meeting.

I told you then about T.N.I.'s Naalakvik II Television Project. I told you that the organization that I represent, Taqramiut Nipingat Incorporated had introduced the first-ever television service to five communities in Arctic Quebec. I mentioned that we were providing six hours of taped programming on a regularly scheduled basis to each of the communities. I said that we had built the first ever television studio in the Eastern Arctic and that the studio had become fully operational. I spoke with some excitement about the Inuit students we had in a year-long training programme. I told you of the confidence I had of the ability of the Inuit to seize hold of the technology of satellites and television and to make these complex systems instruments to be used to serve the Inuit and to protect our language and culture.

Almost a year and a half later I can now tell you that I believe that we have succeeded beyond even my most optimistic expectations.

As I stand here now I would like you to join with me in celebrating our accomplishments over the past year and a half. The tape delay operation is still running and is still the only television service available in our communities in Northern Quebec. The original trainees that I talked about in June of 1980 did a spectacular job; they produced nine hours a week of regular television programming from October 1st 1980 to March 1st 1981. In the month of March of this year the programming output was five hours a week. People who know the television business far better that I do say that this is a remarkable achievement for ten people to accomplish. Our project operated with a TVTR uplink in Salluit, the location of our television production and training unit and with four TVROs in Kuujjuaq, Kangigsualujjuaq, Inukjuaq, and Kuujjuaraapik. I have to tell you that our staff worked very very hard to fulfill the time commitments and in many cases exhausted themselves by the end of the project. Our project was due to terminate on February 17th, 1981 but we sought and received an extension beyond that date. We were unfortunately obliged to quit some six weeks later when we were unable to raise funds to continue.

All programming of course was in our language. The Staff tried very hard to provide balanced programs. We made a special attempt to provide television news to the communities. We

produced twenty to forty minutes a week of regional news, with appropriate clippings and visual aids which were incorporated into the news program. A second major effort was an Inuktituut version of national and international news. In this case, an hour and a half of television visuals were sent from the C.R.C. at Shirley Bay to Salluit where the material was over-dubbed in Inuktituut and sent out the following day to the communities. This was the first time national and international news had been made available to the Inuit in Inuktituut on television. We made efforts to have local musical groups and entertainers available on television and we did not over-look church programming and gospel singing in Inuktituut. Stories and legends and interviews with many of the old people formed an important part of the programming as did special informational programming on the various service organizations run by Inuit in our land. Talk shows, guests and information programs were a regular feature, and there were a large number of documentaries touching on the development and use of traditional skills, hunting, fishing and so forth. Looking back on it all we sometimes wish we had had more programming for children and more special programming for Inuit women.

I have rightly judged that the primary success for the Naalakvik II Project rested with the Inuit staff who worked long hours, showed immense dedication and produed first-rate quality programming for the Inuit of Arctic Quebec. It would be wrong of me though not to acknowledge the key agencies which sponsored and provided invaluable assistance to us. The Department of Communications made available the satellite time and the machinery needed to utilize it. The Ministère des Communications of the Government of Quebec undertook the expensive job of installing and removing the satellite terminals and then generously offered to assist T.N.I. by undertaking the technical evaluation of the project. The Department of Supply and Services and the Department of Indian Affairs supplied the money required to develop the operational project on the ground. Finally, I would like to point to the excellent assistance we had from T.N.I. support staff, consultants, trainers and advisors. As all of you know who have operated projects of this nature, the key to success is in bringing together a wide range of people of varying skills: - people who are committed to the success of the broad goals of the organization and we at T.N.I. were particularly fortunate in having had such people available.

Many of you may know of the outcome of the two Inuit television projects. We went to the federal government and we argued that the success of our projects was so self-evident it would be unthinkable to terminate the Inuktitut television service we had begun. After much thought, the government agreed, and on July 6th of this year the Minister of Indian Affairs announced that up to $3.9 million would be made available to Inuit Tapirisat of Canada and to Taqramiut Nipingat to continue the highly successful television project we had begun under the

ANIK-B program. The Minister said that the projects "...had been characterized by good management, broad and intensive community involvement, and a high degree of professionalism on the part of the Inuit employees and trainees." The Minister also indicated this was an interim measure and that further policy initiatives would be forthcoming in the months ahead.

The second major initiative we Inuit took was to make application to the Canadian Radio-Television and Telecommunications Commission and argue the necessity for an Inuit Broadcasting Corporation. This Corporation, by utilizing programming produced by Taqramiut Nipingat and Inuit Broadcasting Corporation, would share transponder time with the Canadian Broadcasting Corporation. Acceptance of our proposal would bring about the development of the first television network of its kind, as far as I know, in the western world. You may also be aware that the C.R.T.C. approved that proposal and the I.B.C. is now licenced and operational. We, - and I have to say "we" because five weeks ago I was elected the first president of the Inuit Broadcasting Corporation, - we plan that programming will soon be delivered to the C.B.C. on a regular basis. The C.B.C. will uplink from Allan Park to the Arctic Inuit Communities.

I must tell you that even in my most optimistic moments, in spite of my dreams, I sometimes doubted that it would ever be possible for the Inuit to have a television network of our own. That it has become possible is solely because of the opportunity provided by the ANIK-B pilot project for us to demonstrate our abilities. We have done our share. But now there is another job to be done and I want to state it here in the hope that a solution can be found.

By way of background I must say that T.N.I. is, as far as I know, the only native organization that has participated in two experimental satellite projects.

In 1978 T.N.I. operated a Hermes project which tied together eight of our communities in Northern Quebec into a radio network. We installed low-power community FM radio stations in the communities, built a central radio production unit and operated from September to December, 1978. When it was over the communities pressed T.N.I., - indeed, <u>demanded</u> of T.N.I., that this type of service continue. As you may be aware there are no land lines or microwave systems in our land; there is either satellite or H.F. radio. We thought that by using a standard audio channel of telephonic quality that we could develop a network that would be satisfactory to our purposes. We approached Telesat Canada to work with us to develop a system which would serve our needs. I must tell you now that it took almost two years to get a quote which eventually arrived from Bell Canada. The cost was much too high. We had raised money but we could not pay the amount of nearly $190,000 a year

that was quoted. We eventually had to drop the whole matter. My impression was that actually the people who ran the commercial end of the satellite system weren't very interested in doing business with the Inuit.

I must tell you now that much the same thing is happening today. The government has provided funds to T.N.I. and to I.B.C. to operate two uplinks in the north so that we can utilize C.B.C. time on the satellite. An amount of funds have been made available, but we are experiencing great difficulties in getting appropriate cooperation from the commercial operators of the satellite system. A request for a quote for one terminal has taken almost five months to get a response in writing, and then there were conditions placed on it related to time and other factors which were simply impossible for the Inuit Broadcasting Corporation and Taqramiut Nipingat to meet. We are working on a daily basis to solve these problems. It is my hope that we will be able to find a solution and not end in total defeat as we did when I tried to establish a very simple dedicated party line by satellite two years ago.

I had the honour and the privilege of witnessing the launch of the ANIK-B satellite and I must tell you that it left a powerful impression on me. I felt that my country was in the lead of world satellite technology. Many technical people tell me that my impressions are true but my experience is that the whole system is failing in its organization and its management. There is no point in having satellites if people can't use them and there is not much point in having experimental satellite projects if the result is that the same handful of businesses continue to guard jealously their access to the satellite and put their own commercial interests ahead of the interests of groups such as the Inuit.

I'm not here to complain but I'm here to say something that I believe many people in this room are aware of and I believe we need a quick solution so that the I.B.C. can develop to its full potential. I thank you.

2E-1E KNOWLEDGE NETWORK OF THE WEST

- Knowledge Network of the West -
Communications Authority

Presentation by:

D.W. Roach
Executive Director
Network Services

2E-1E - KNOWLEDGE NETWORK OF THE WEST

Project Title: Knowledge Network of the West

Project Sponsor: Knowledge Network of the West Communications Authority

Project Manager: D.W. Roach

Project Objective:

To provide learning opportunities to all British Columbians by substituting communications for transportation through the establishment of an telecommunications delivery system.

I am pleased to have this opportunity to report to you the success of Knowledge Network, Canada's latest development in the field of distance education via television.

Knowledge Network is the television service of the Knowledge Network of the West Communications Authority, the educational telecommunications authority for British Columbia.

Educational television certainly is not new to British Columbia. What is new, however, is the innovative way it is being used to help existing educational organizations to better meet the needs of the 1.2 million people who live away from the major population centres of Vancouver and Victoria.

In relating the success of Knowledge Network, I would be remiss if I did not take the early opportunity to acknowledge the assistance that the Federal Department of Communications (DOC), and in particular Terry Kerr and the staff of the Communications Research Centre, has provided the Network. I hope the DOC will continue to play a major role in fostering the further development of new satellite services, particularly those services hoping to transfer to the ANIK-C series. More on this point later.

In the space of a very few months - since January 12 of this year - Knowledge Network has blossomed into a major new service to British Columbians. Using the latest communications technology and combining it with new approaches to educational delivery, Knowledge Network, in association with B.C.'s educational institutions and government ministries and agencies, is filling a void in the lives of British Columbians, especially those anxious to upgrade their personal or professional qualifications.

Using the ANIK-B satellite and cable channels reserved by cable operators for educational programming, today Knowledge Network is delivering 98 hours a week of programming to more than 1.8 million people in more than 60 communities. In less than one year, we have developed the ability to reach 72 per cent of the people in British Columbia.

That's today. A brief historical review will explain yesterday. In 1976, through three educational commissions, British Columbians made it clear that they wanted the opportunity to participate in educational programs that would allow them to advance themselves. They wanted something in addition to the established post-secondary system, the colleges, institutes and universities. They were particularly interested in career and professional upgrading opportunities.

Unquestionably, the loudest voices belong to those in the non-metrololitan areas, communities away from where the major post-secondary institutions are located. These people no longer wished to be socially or geographically isolated. The provincial government agreed.

With the need clearly defined, the government, through its Ministry of Education, began to address the problem. It initiated a number of activities including making application to the CRTC for the reservation by cable operators of cable channels for educational programming and investigating the various methods of delivering a program signal to cable company head-ends. Similar initiatives were also under way in program development.

Originally it was thought that a microwave network could be created to delivery a program feed. However, B.C.'s topography and dispersed population centres made such a development economically prohibitive, forcing either a delay or the investigation of alternatives. A delay was not possible. Alternatives had to be found.

Almost coincidentally with the examination of microwave links, Canada and the United States, in 1977, launchd the experimental Hermes satellite and the DOC invited potential users to experiment with the new technology. The B.C. Ministry of Education accepted the invitation, and after a brief two-month project, was convinced that when combined, education and satellites held great potential. In 1978, when the DOC issued a call for experimental users for its ANIK-B project, the Ministry of Education leapt at the opportunity and undertook a larger experiment, one which included a major inter active component. Again, the success clearly indicated that satellites held the answer.

Recognizing the potential of the new technology and the social and economic benefits that could be derived from it, the provincial government, in the spring of 1980, made a commitment to formally involve the province in a satellite program and instructed that a new organization be created to give leadership

in this area. Accordingly, on May 28, 1980, the Knowledge Network of the West Communications Authority was registered under the Societies Act of British Columbia.

Knowledge Network was given a two-part mandate: "to establish, maintain and operate a telecommunications network" and "to assist and collaborate with universities, colleges, institutes, school districts, ministries and agencies of the government in the development, co-ordination and delivery of educational programs and materials." The Network clearly had a hardware and software mandate. It has also assumed, by adopting the model developed by the Russian engineer, Dubrov, a mandate for teachware and orgware, but more about this later.

Knowledge Network is not an educational institution. It provides the electronic highway which carries the educational programming developed or sponsored by the educational or government agencies. Its success is dependent on the co-operation of the educational institutions, both in the prepartion of learning materials and in the developing and operation of the delivery and support structures in local learning centres throughout the province. The Network does not offer courses, it does not enrol students, and it does not give credit.

As the utility responsible for the electronic highway, the Network is developing three services: a public service, which uses satellite and cable to delivery programs into the homes and local learning centres; an inter institutional service, which uses satellite and cable to deliver programs into local learning centres; and a restricted service, which will use satellite and cable to deliver programs to selected sites. The first two services are operational now, on a combined basis, while the third will be operational upon completion of a dedicated, multi-channel cable facility being built for the Network in Vancouver and Victoria.

In highlight form, those are the three services the Network undertook to establish on behalf of the educational and government users.

I am pleased to report that today, since our debut as a public service January 12, 1981, the Knowledge Network has enjoyed tremendous success. We began programming 77 hours per week to 35 communities and have expanded to 98 hours per week - 14 hours a day, seven days a week - to more than 60 communites.

The program schedule includes tele-courses and tele-series, both of which may include live, inter active components during which students throughout the province are able, by telephone, to question the instructor or tutor or a student in another community. While this is an exciting application, it is now not new. Open-line radio and television programs have been doing it for years. What is new, is its application for educational purposes.

The tele-courses and tele-series cover the spectrum from pre-school programs to university programs. Some are offered for transferable credit, some are offered for certification, some are offered for personal interest and enrichment. All are available to the public, whether they wish to enrol or just watch for enjoyment.

Our third program season - or learning season as we call it - is now well underway, while our fourth is in the advanced planning stages. We schedule three learning seasons a year, providing opportunity for a variety in program content. An interesting program note; 56 per cent of our fall learning season is Canadian in content.

Enough about software. Let's talk hardware.

Knowledge Network shares the western transponder of ANIK-B with the CBC and BCTV. The signal is uplinked, via a DOC-owned terminal, from the Network's distribution centre on the University of British Columbia campus. In the communities, a number of configurations are used to receive and re-distribute the signal. In some communities, a cable operator has acquired a Television Receive Only earth station (TVRO) and has placed it at its head-end; in some, the community college has acquired a TVRO and has placed it at the cable head-end, or at the college itself while the cable operator has taken a feed back to its head-end; in some, Knowledge Network has placed a TVRO either at the college or cable head-end; and in others, a local community association has purchased a TVRO for local use. Each method works, although naturally each has its advantages and disadvantages.

The majority of the TVRO's are 1.8 metre, with some three metre units being utilized on the edge of the footprint. The sharing of one transponder between three video signals produces a weak transmission, resulting in a degraded signal in some communities using 1.8 metre units. With the larger units, reception is better. We hope with a transfer to the ANIK-C series, the 1.8 metre units will provide satisfactory quality.

We anticipate that, in the very near future, the Network will be providing two satellite channels. The first will continue to carry the public service to homes, while the second will carry programs designed for inter-institutional or restricted audiences. The second channel will not be available on the educational cable channel, but will be received in the local learning centre, hospital, library or similar community facility.

We want the second satellite channel to begin prior to the introduction of ANIK-C. Our programmers are developing their expertise at the moment by sharing the public service, but we believe the major benefits will come once the services can be separated. We have already requested permission from the DOC to program a second ANIK-B service once satellite capacity becomes

available. This application of the technology to medical and legal purposes and other highly skilled professional areas is, we believe, further justification for the DOC to continue its role in fostering new services.

With the launch of the ANIK-C satellite, the Knowledge Network will become a commercial user of satellite services. We are already discussing with Telesat Canada our anticipated needs, and we are optimistic that Telesat, as the federal crown corporation responsible for Canada's domestic satellite program, will ensure that our needs, and the needs of other Canadian users, are its first priority.

I've presented the Network's activities in hardware and software, two of the four elements in Dubrov's model. I now want to talk briefly about the other two elements, which I quickly mentioned before, teachware and orgware.

As it has in hardware and software, the Network has a major role in teachware and orgware: the first, helping people learn how to use the new hardware and software; the second, creating new structures and changing present ones so, that once having learned how to use the technology, people are then free to optimize its potential.

Knowledge Network is an agent for change. Making one change impacts a series of other elements which then must also change. It's a snowballing effect that we believe will result in new products and services for all. People must begin to understand that established or traditional methods may not be the best for the new technology. Again, I am pleased to report that we are also having considerable success in teachware. The most important success is eliminating the fear of change.

The final element, orgware, is perhaps the key, for unless structures are modified or eliminated to accommodate the other three, nothing will have been achieved. The Network is encouraging those who regulate or govern to review and amend their policies and procedures so that innovation can occur. This session today may be another step in this process.

British Columbia's educational institutions and government agencies are responding well to hardware, software, teachware and orgware. They are rapidly realizing that there are new ways - ways that are more economical and at least as effective - to meet present and future needs. It's also encouraging that others, beyond British Columbia, are watching and learning from us.

Participation in the DOC's ANIK-B Project has enabled Knowledge Network to demonstrate to government, to educators and to the public that by substituting communications for transportation, and by developing new methods of educational

delivery and support, a province-wide electronic classroom can be an effective vehicle for learning. The project has provided, for many people, their first opportunity in years to participate in learning. It is demonstrating to British Columbians that learning is not elite, that we all can learn.

It is demonstrating that dollars can be saved, a factor that cannot be overlooked in today's economic climate. The economic benefits accrue not only through savings in travel and related expenses, but more importantly, through the social and economic impact achieved by stronger and happier individuals and communites.

Knowledge Network's future is uncharted, but we know that it will undoubtedly include a second satellite channel; a closed-circuit, multi-channel cable and microwave link in Vancouver and Victoria; tele-text, slow-scan, data transmission and FM radio. These, and the many new developments just being exposed, must all be investigated and explored if the Network is to continue its leading-edge role. We are anxious to undertake the work, and again, that is why we hope that the DOC will continue its support of such programs.

In his opening remarks this morning, Dr. Colin Franklin told us that the DOC, internally, is questioning whether it has a continuing role in fostering new applications of satellite technology. I am convinced that what is being shared here today is evidence that the benefits of DOC participation are enormous, and that there must be a Phase III of the ANIK-B Project, with terms similar to Phase II.

Dr. Franklin reassured us that the DOC clearly feels an obligation to those users who have developed services for transfer to ANIK-C. We were extremely pleased with the assurances of the Minister, Mr. Fox, who in announcing Phase II, stated that continuity would be assured until commercial service became available. I trust that assurance, and the long-term applications and benefits, will not be put aside for short-term financial gain.

Nowhere in Canada, or perhaps the world, is the television technology being used in such a comprehensive fashion with such a range of eductional programs. In announcing creation of the Network to the British Columbia Legislature, the Minister of Universities, Science and Communications, Dr. Patrick McGeer, predicted that Knowledge Network would become a water shed for education in B.C. Knowledge Network is well on the road to fulfilling that prophecy.

2E-3E TELE-EDUCATION PROJECT

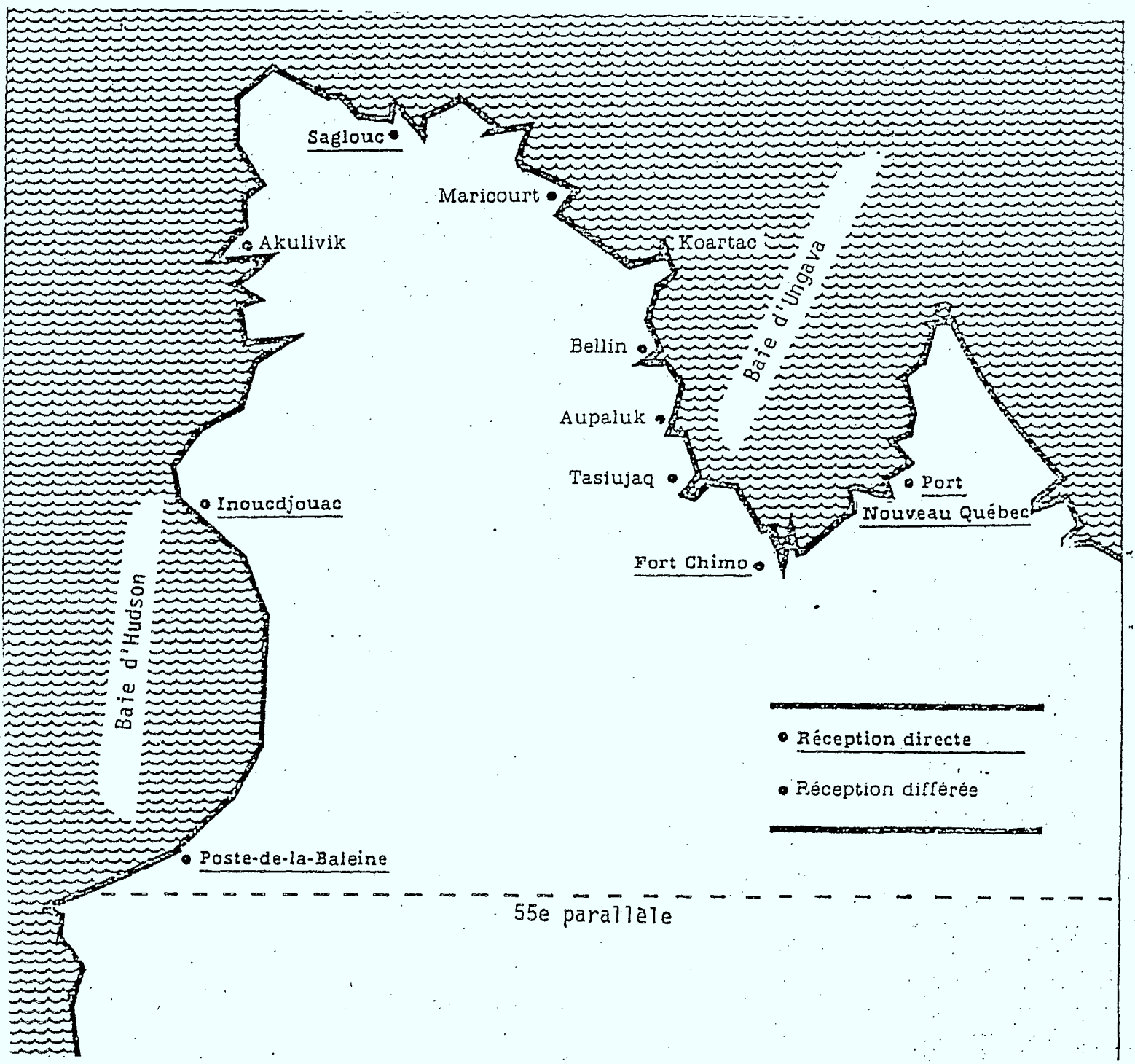
- Quebec Department of Education -

Presentation by:

M.G. Legault
Director
Kativik School Board

2E-3E KATIVIK PROJECT

Title of Project:	Kativik - Anik-B
Sponsors:	Quebec Department of Education Quebec Department of Communications
Managers:	Kativik School Board
Objectives of the Project:	To establish communication links between the Kativik School Board and the Inuit population located north of the 55th parallel.
Main Features:	Financing: $120,800 (QDE) Establishment of a production studio (Dorval) Establishment of a network (north of 55th parallel) Co-operation with Taqramiut Nipingat Inc. (Salluit) (Naalakvik II).


Saglouc
Maricourt
Akulivik
Koartac
Baie d'Ungava
Bellin
Aupaluk
Tasiujaq
Port
Nouveau Québec
Inoucdjouac
Fort Chimo
Baie d'Hudson
Réception directe
Réception différée
Poste-de-la-Baleine
55e parallèle

Description of the Situation

From October 1980 to May 1981, five Inuit villages were directly linked by television through the use of the satellite. The pilot project Kativik Anik-B, which was put forward and financed by the QDE and managed by the Kativik School Board, operated for a period of eight months, broadcasting 127.5 hours of programming to local communities.

The experiment provided the Kativik School Board with a working tool (temporary) in the North and with production equipment to meet its teaching needs, as well as the need for information in the native environment.

The evaluation of the project provides an opportunity to identify certain facts and concerns for the future.

1. The Use of the Satellite in the North changes the Parameters of Communications in general, and those of Education in Particular.

The satellite will become a special tool for providing a simultaneous and direct audio-visual link between local communities and ensuring a presence among the people.

At present, the provision of such a link requires the participation of numerous parties: the satellite and equipment are federal; the equipment was installed by the QDC; Radio-Quebec trained the Inuit technicians; various Inuit groups and the Kativik School Board used the satellite. This participation currently has a transitory aspect to it because of the temporary nature of the satellite's use and the experimental nature of the projects. This situation will in future be clarified and stabililized. Indeed, in January 1981, a conference was held in Saglouc on communications in the North. In July 1981, the federal govenment announced it was allocating $3.9 million to this field.

The role of Quebec must also be clarified and this will require a concerted effort by the various Quebec participants in the North

The Kativik School Board is undoubtedly one of the main participants both because of the educational nature of its participation and because of its financial and human resources in each of the northern villages: many employees, buildings, homes, circulation of money, etc. The pilot project clearly reflected the key position played by the School Board. The Board used 41.5% of the satellite air time available in the North. The other user was Taqramiut Nipingat Incorporation (TNI) which is an Inuit organization. The Board therefore provided a major public presence through the use of television via the satellite.

During this project, and in the near future, the satellite will be a special instrument facilitating an expansion in the listening public.

This document is even more pertinent when applied to the field of education. A system which makes possible the direct and simultaneously broadcasting of programs into almost all homes will have assisted in the practical expansion of the concept of education. Home television has become public educational television.

2. The Pilot Project laid the Foundation for the Permanent use of Television by the Kativik School Board.

Funds from the QDE ($120,800.00) enabled the Kativik School Board to obtain the equipment required to produce television programs (studios, camera, etc) and to hire the personnel who developed expertise in this area. These acquisitions laid the foundation for the permanent use of the television for educational purposes. Not only did the project demonstrate the ability to produce quality programs but to do so at minimum cost.

This situation was further enhanced by the newness of television in the North. Inuit have been able to enjoy this media only since January 1980. There is thus a certain infatuation with television, a demand for more programs, a requirement for quality productions.

The Kativik Anik-B project tried to meet these demands; 80% of the programs broadcast were produced by the project team. More than three-quarters of the programs were in Inuititut and thus understandable by all listeners. The project stimulated concerned educational programming with complete respect for the Inuit culture and language.

The success of the project among local communities encouraged the School Board trustees to incorporate the production team in the structure of the Board permanently in the form of a resource centre. The equipment and expertise acquired would thereby be used to maintain steady program production.

3. The Pilot Project Reveals the Potential of a Complete Receiving System.

By covering five villages in the North, the Kativik-Anik-B experiment made it possible to link the main schools of the Board and to reach 80% of inhabitants living in the villages in New Quebec who wished to participate in the project.

Unfortunately, the receiving infrastructure made it impossible to rearch everyone. The village schools are equipped with only one television set (with video tape recorder) each. Schools usually consist of several buildings. Thus maximum service would require greater ease of reception or, in other words, more television sets.

Furthermore, seven villages were unable to benefit from the direct broadcasts. They did however receive copies of the programs produced. This inequality was felt deeply. In the long term, it will be unacceptable because the type of system in question should be global to be fully effective. The cost of the necessary equipment can no longer be regarded as an obstacle in view of the drop in the prices for satellite communication equipment. Lastly, the growth in the size of the villages brings into question the power of local transmitters: one end of the village could have reception problems if the antenna was located at the other end.

By showing that it is possible to cover and broadcast to the majority of inhabitants, the experiment has also shown that we must think and plan for the future.

This section (Description of the Situation) was prepared by Mr. Bernard Mataigne, the Project Evaluation Officer. A more detailed report (approximately 100 pages) is available through the Teaching Methods Branch, Experimental Section, 600 Fullum Street, 4th Floor, Montreal, Quebec.

2E-5E ALBERTA EDUCATIONAL COMMUNICATIONS AUTHORITY

ACCESS

- Alberta Government -

Presentation by:

S. Beresh
Alberta Government

REVISED

2E-5 ALBERTA GOVERNMENT

Project Title: Alberta Educational Communications Authority

Project Staff: L. Shorter
I. James
H. Kratz

ACCESS Alberta is most appreciative of this opportunity to share with other satellite users our enthusiasm for participating in programming via ANIK-B.

My name is Sherrell Beresh, I'm representing Mr. Larry Shorter, ACCESS President and Mr. Ian James, Director of Special Projects at ACCESS. We, along with other key personnel and a variety of clients, are in the final preparation stages for an interactive satellite experiment which will occur from January to June of 1982.

The sponsors of this project are the Alberta Educational Communications Corporation and the Department of Communications.

The objective of our project is to provide the people of Alberta with an opportunity to receive and respond to educational programming delivered with the latest assistance of electronic technology.

The ACCESS Alberta mandate is to produce, acquire and distribute educational media for the people of the province. With this in mind we are ever in search of ways of improving our service. We see satellite delivery of educational programming to be a fast, efficient and cost-effective alternative to our traditional means of broadcast via the CKUA radio transmitter and via purchased time on the province's commercial TV networks. We look to the multiple carrying capacity of the satellite to meet the diversity of needs of our clients. Satellite offers us future opportunities to pursue an alternative delivery mode for television and AM/FM radio, slow-scan TV, S.C.M.O. (subsidiary communications multiplex operations), and even digital data for computers. In particular, we want the satellite to provide an interactive electronic highway for educational institutions in the province.

We look to the satellite to reduce the ever increasing costs of educational media distribution. It's a considerable expense to distribute video tapes and audio tapes from our media resource centre in Calgary to users thoughout the province. As well, this present system of mail delivery is at times unreliable and often slow, comparatively speaking. Use of satellite technology is simple, quick and reliable. We look to the future use of satellite to download programs during the late night hours and to have them automatically recorded in the schools and other institutions which utilize our materials.

As you may recall, this is not the first opportunity for ACCESS to link with ANIK-B. Previous experience with the satellite was most rewarding and, encouraged by our observation of the success of Knowledge Network and other satellite users, we hope to use this next phase to refine our expertise in the new technology.

We view satellite programming as very effective in educational terms; I'd like to share with you an interesting observation which came out of our earlier satellite experimentation. When we offered a Grant MacEwan Community College Library technician processing training course via satellite, the group of students enrolled in a distance education course had a lower drop-out rate and better academic performance than the control group of students taught by conventional classroom means. To put it another way, we found that satellite TV can reduce the "loneliness of the long distance learner".

Satellite will also allow us to extend our service to isolated areas of the province and thus meet our Board of Directors' priority of distance delivery to rural communities. Satellite technology can gather together small numbers of students in many communities and make viable those courses that could not be offered in a single location because of minimum enrollment regulations.

Satellite also means a considerable saving in terms of instructor time and travel costs. Rather than having an expert travel from Edmonton to a small northern community, with the attendent cost in airfare, meal allowance and perhaps the most valuable resource ----- time, we can satellite-deliver the expertise, and to more than one location.

We would also look to the satellite for the opportunity for interprovincial cooperation with other satellite users. We have been most grateful for the assistance of Knowledge Network during our past satellite experimentation and we are optimistic about future possibilities.

Until now, we have been limited to one-way transmission of satellite TV which allows only passive viewing by learners. What we are planning now is a six month period of experimentation in live two-way interactive communication. During the months of January to June 1982, an Alberta audience may participate in seminars, discussion groups, question and answer sessions and other forms of instant communication with their instructors or resource people in Edmonton.

We are particularly enthusiastic about this possibility because of the research which indicates that learning is enhanced by student participation. We will be providing nine hours a week of TV time to a number of agencies involved in educational endeavors. This time has been established as the hours of 6:00 to 9:00 p.m., on Monday, Wednesday and Friday evenings.

The following educational agencies have confirmed their participation: Grant MacEwan Community College, Consumer and Corporate Affairs, University of Alberta-extension Division, The Alberta Native Communications Society, Athabasca University, The Department of Education-Communications Branch, The Department of Agriculture, the Alberta Teachers' Association, The Alberta Alcohol and Drug Abuse Commission and The Alberta Correspondence School Branch. There are also a number of other organizations who will be finalizing their participation in the very near future.

Without going into great detail about particulars of the courses offered, I'd like to give you some idea of the variety of topics to be presented: Nursing Upgrading, Money Management, Housing and Mortgage Information, Food Safety, Photography, Native Peoples' Issues, Library Technical Processing, Basic Horse Care, C.P.R. (Cardiopulmonary Resuscitation), Math Upgrading, French Language Instruction, Agricultural Updates, Parental and Teacher Affairs, and Alcohol and Drug Abuse Information.

This is how it will happen: The cooperating organizations are sending instructors or program hosts to our production studio in Edmonton. From there, via the uplink trailer, the signal will be delivered to five northern communities in Alberta and possibly to cable TV audiences in Edmonton and Calgary.

The present location of the satellite dishes are as follows: Grande Prairie (with a link to the Cable TV Network there), Fairview (at Fairview College), Grouard (at the Adult Vocational Centre), High Level (at the High School), and Peace River (at the Adult Education Centre). From these locations, the audience can instantanteously interact with the instructor or host in Edmonton via a toll free zenith line.

The response of client institutions to our satellite project has been very enthusiastic. We anticipate that their participation will be most successful.

As for future plans, it would be ACCESS's first priority to eventually lease a full transponder on ANIK-C for full-time 24 hour potential delivery of our material. This transponder would allow us to carry educational programs for elementary and secondary schools, teacher-in-service, parent education, adult education, computer programs and electronic mail. Failing that, ACCESS would be pleased to jointly lease a transponder with another institution and share the costs and scheduled times.

Whatever scenario develops, of one thing we can be sure; ACCESS is committed to initiatives in the new technology, for us in ACCESS the <u>future is now</u>.

2H-1E TELEMEDICINE PROJECT

- Memorial University of Newfoundland -

Presentation by:

M. House
Assistant Dean of Community Education
Faculty of Medicine

MEMORIAL UNIVERSITY OF NEWFOUNDLAND ANIK B PROJECT - PHASE ONE

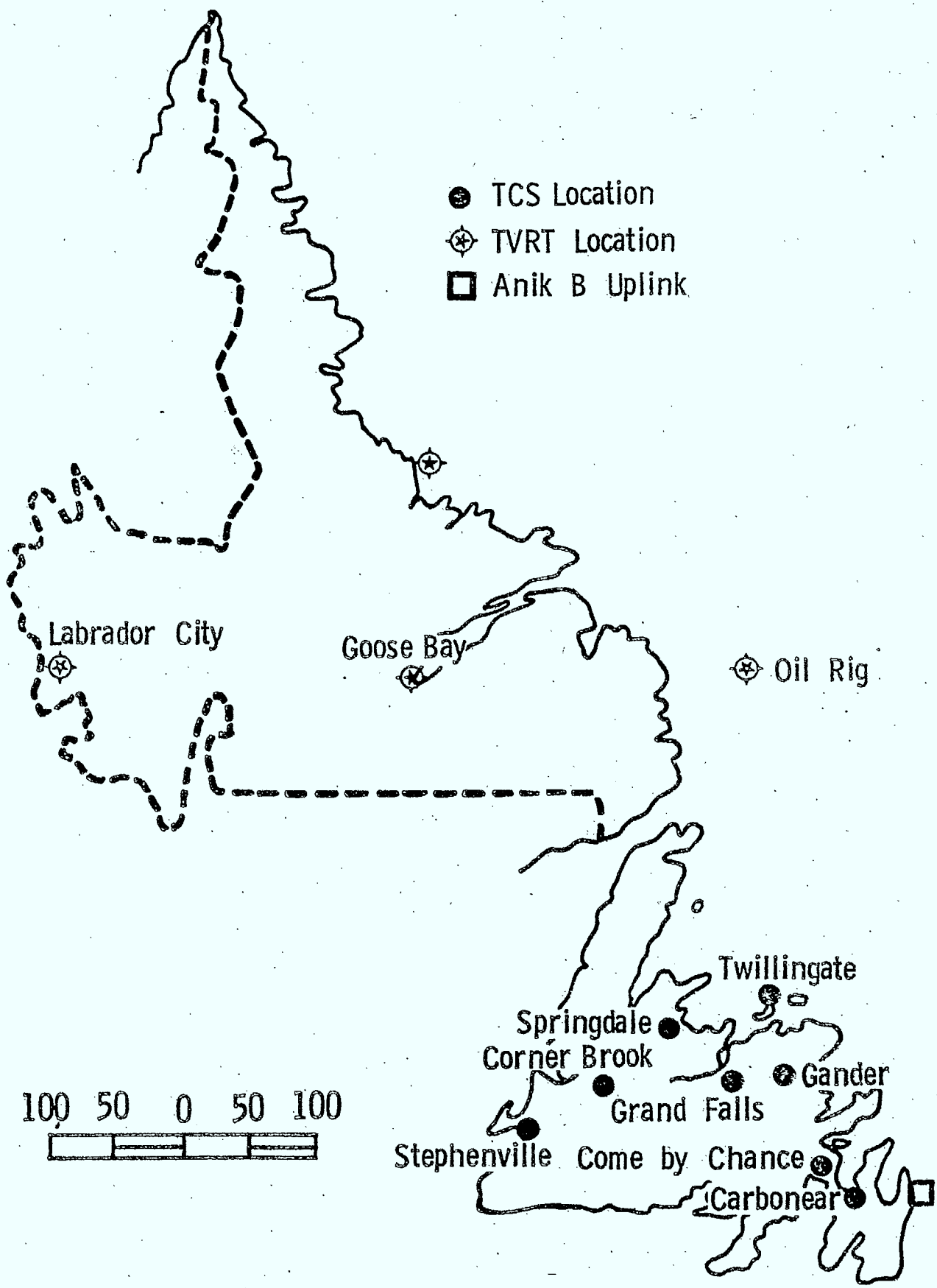
OBJECTIVES

(1) To test satellite capability to provide interactive audio system for health and education.

(2) To assess feasibility of linking satellite and terrestrial audio systems.

(3) To assess role of satellite in offshore petroleum exploration.

(4) To test capability of SSTV in offshore and Labrador settings.


TCS Location
TVRT Location
Anik B Uplink
Labrador City
Goose Bay
Oil Rig
Twillingate
Springdale
Corner Brook
Gander
Grand Falls
Stephenville
Come by Chance
Carbonear
100 50 0 50 100

NEDDRILL TWO

Dates	:	July - September 1980
Technology:		32" terminal Manually steered pedestal
Results	:	Test signals successful Technical and logistical problems
Conclusion:		Future potential justifies participation in expanded offshore project with Newfoundland Telephone Company

LABRADOR TERMINALS

Dates	:	September 1980 - May 1981
Technology	:	3 metre 4 wire telephony
Results	:	Successful system performance Hours of operation a constraint
Conclusion	:	Role in distant locations justifies retention of Labrador City terminal Maintenance by Newfoundland Telephone Company.

2I-1 DEVELOPMENT OF PETROLEUM INDUSTRY SATELLITE SYSTEM STANDARDS

- Canadian Petroleum Association -

Presentation by:

W.R. Taylor
Project Manager

2I-1 Development of Petroleum Industry Satellite Standards

Project Sponsor: Canadian Petroleum Association

Project Manager: W.T. Taylor

Although the Canadian domestic communication satellite system has been operational for nearly a decade, the use of satellite terminals within the petroleum industry to provide logistical communication to our field sites remains a rarity. The reasons are quite simple: the tariffs for the service are cost prohibitive; the service abounds with regulatory and institutional barriers which constrain its use; and there are far too many problems associated with the logistics of installation and maintenance.

Yet, on numerous occasions during the past decade, the carriers and the Department of Communications have demonstrated the viability of using satellites for this purpose. For example, in 1977, Shell Canada worked with the Department of Communications to install a Hermes earth station at an Arctic drilling site on Cameron Island (77°N lat.), to demonstrate within the petroleum industry unprecedented telecommunications to such a remote site. Data and well logs were transmitted directly to Calgary. But these demonstrations have done little, beyond wetting our appetite for better service, to address the problems prohibiting our usage of satellite services.

Our objective in participating in the ANIK-B Phase II Program is to stimulate the development of more viable cost-effective satellite services which are designed with the unique needs of the petroleum industry in mind.

It is our belief that within the next decade, the petroleum industry will come to depend on satellite communications for much of our field activity, especially for the new frontier and offshore operations which are so highly favoured in the government's National Energy Program.

There are several factors which lead us to this conclusion. Experienced personnel within our industry are becoming a scare commodity, so that in future there will be a tendency to centralize staff expertise. The cost of supporting field operations is rising exponentially. The logistical control and management of this expense will necessitate better communications. The evolution of microprocesor technology and other electronic control functions, within the petroleum industry will lead to an unprecedented reliance on data communications to

field sites for control and reporting systems. Management information systems will require data capture at source and will have to be updated in "real time". In off-shore operations where costs exceed $200,000 per day, SSB HF radio will no longer be sufficient.

We hope that through participating in the ANIK-B program, it will serve as a vehicle to give higher visibility to the immediate and long term telecommunication needs of our industry. Satellite systems have long planning and provisioning cycles (i.e. 10 years). By exposing the explorationists to the potential of satellite communications, we hope to contribute to a more realistic market needs analysis for the carriers to respond to today, and the system planners to respond to in years to come.

Our program consists of installing terminals in various types of field sites: geological camps; gas gathering system telemetering sites, drilling sites; Arctic and off-shore exploration operations. To date, Shell has used the terminal at Black Lake, Saskatchewan at a geological camp to provide voice communication and Amoco are now using it at their Drayton Valley field office to transmit data from a radio transmit unit (RTU) in their field telemetry.

The project has met with considerable success to-date. It has received the enthusiastic support of some carriers - in particular A.G.T. A.G.T. have responded to the interest shown by CPA and are working with us in a similar program now at 4/6 GHz using new 2nd generation terminals. The CRC has also responded favourably and are working with us to develop more cost-effective stablized 2nd generation terminals to service the off-shore requirements. Other petroleum companies outside the CPA membership have expressed interest in participating in the program and this support is being encouraged.

It is difficult to say so early in our program, whether CPA will need to carry on its efforts beyond September 1982 into ANIK-B Phase III. We are also working with the Department in their planning of the MSAT satellite in the belief that in the long term, the cellular mobile service possible with the satellite will address many of our communication needs.

It is however our hope that the industry will be able to make more effective use of our own domestic communication satellite system in Canada and not have to rely on international services of systems such as MARISAT, which are neither well suited to our industry in cost nor performance, but which may be our only alternative.

2P-1E MULTI-POINT MULTI-PURPOSE SATELLITE NETWORK

- Ontario Ministry of Government Services -

Presentation by:

N. Biswas

Telecommunications Services Branch
Ontario Ministry of Government Services

PROJECT OBJECTIVES

- TO DESIGN AND IMPLEMENT A PILOT MULTI-PURPOSE MULTI-POINT SATELLITE-BASED TELECOMMUNICATIONS NETWORK FOR ONTARIO GOVERNMENT USE

- TO EXAMINE THE BENEFITS AND COSTS AS WELL AS TECHNICAL AND OPERATIONAL FACTORS ASSOCIATED WITH THE NETWORK

SUB-OBJECTIVES

- TO INCREASE THE AWARENESS OF ONTARIO GOVERNMENT MINISTRIES OF THE CAPABILITIES OF AUDIO/VIDEO TELECONFERENCING USING SATELLITE AND OTHER TELECOMMUNICATION FACILITIES

- TO PROVIDE AN OPPORTUNITY FOR MINISTRIES TO EVALUATE THE EFFECTIVENESS OF T.C. IN OWN PROGRAM AREAS

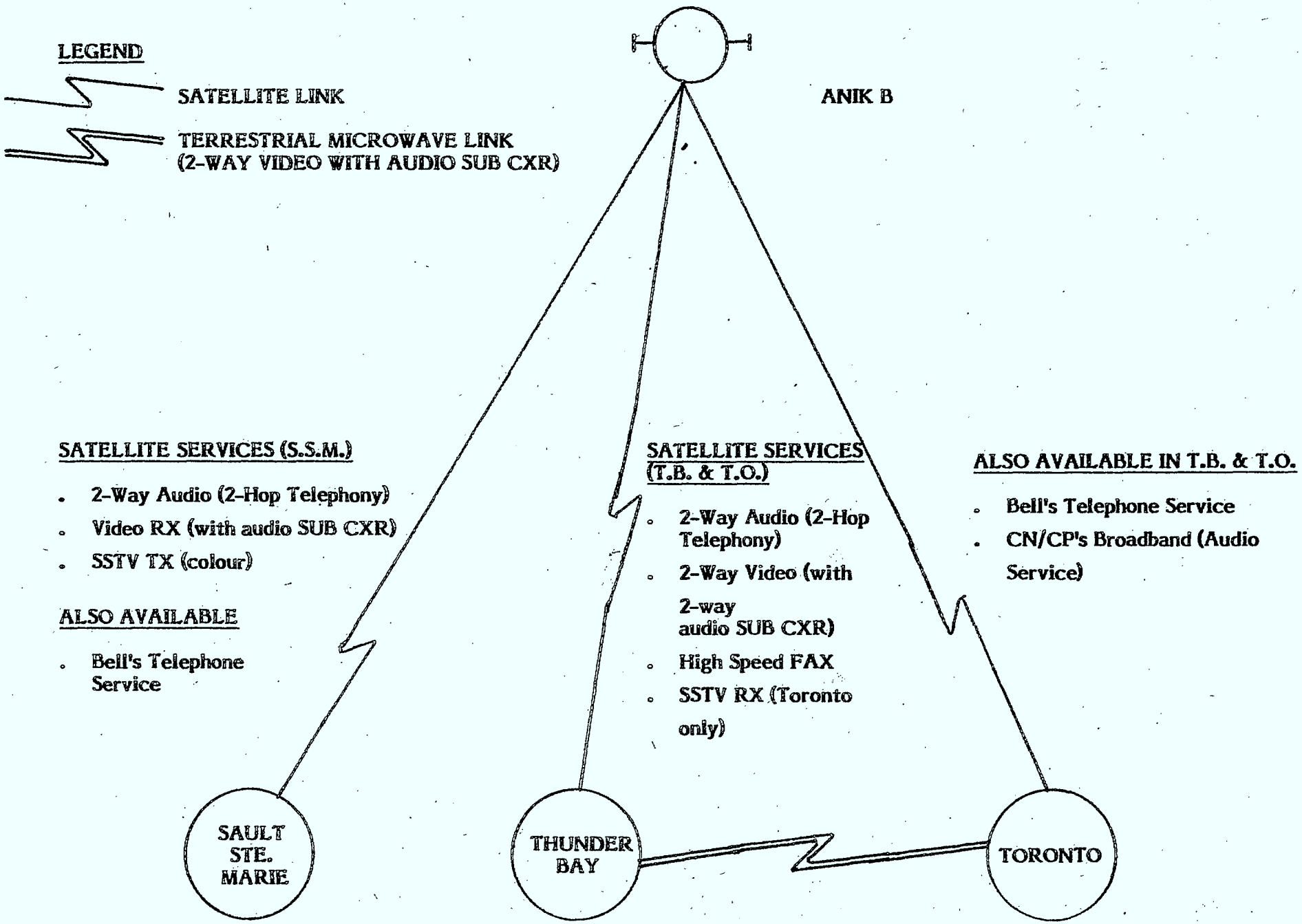
- TO DETERMINE POTENTIAL DEMAND FOR AUDIO/VIDEO T.C.

- TO DEVELOP INFORMATION BASE ON SYSTEM COSTS AND TECHNICAL AND OPERATIONAL FACTORS

- TO COMPARE SERVICE QUALITY AVAILABLE VIA SATELLITES WITH THAT AVAILABLE TERRESTRIALLY THROUGH THE COMMON CARRIERS

SERVICE CAPABILITY

- AVAILABLE 9:30 A.M. - 4:00 P.M.
- SEATING CAPACITY AT EACH LOCATION:
  - MEETINGS - 6
  - SEMINARS - 16
- AUDIO/VIDEO INTERACTION
- AUGMENTED WITH
  - STD OVERHEAD, 35 MM AND 16 MM PROJECTION SYSTEMS
  - FLIP CHARTS
  - HARD COPY MESSAGE TRANSFER
- CENTRALLY LOCATED T.C. CENTRES
- TRANSPORTABLE T.C. TERMINALS



SYSTEM CONFIGURATION

OBSERVATIONS

- ANIK B TYPE SATELLITES ARE TECHNICALLY AND OPERATIONALLY VIABLE FOR A RANGE OF ADMINISTRATIVE AND SPECIALIZED INTERACTIVE AUDIO/VIDEO APPLICATIONS

- SPECIFICALLY ANIK B TYPE SERVICES HAVE THE POTENTIAL OF MAKING AN IMPORTANT CONTRIBUTION TO ONTARIO GOVERNMENT PROGRAM AREAS SUCH AS:
  - ENERGY CONSERVATION
  - THE PROVISION OF IMPROVED MEDICAL AND OTHER PUBLIC SERVICES TO UNDERSERVED AREAS OF ONTARIO

- DEGREE TO WHICH ANIK B TYPE COMMUNICATION SERVICES ARE UTILIZED FOR THE PROVISION OF ANY FUTURE SERVICES WILL DEPEND ON FINAL COST TO END USER, WHICH IS DEPENDENT ON REGULATORY AND INSTITUTIONAL DEVELOPMENTS

EVALUATION RESULTS

TECHNICAL

- TRANSMISSION QUALITY AND RELIABILITY OF SATELLITE GENERALLY GOOD FOR AUDIO/VIDEO T.C. APPLICATIONS: MUCH BETTER THAN THAT AVAILABLE TERRESTRIALLY FROM CARRIERS

- FLEXIBILITY OF SATELLITE SYSTEM VERY SUITABLE FOR T.C. APPLICATIONS

- SOME PROBLEM EXPERIENCED WITH ECHOS

- AUDIO SUB-CARRIER SUITABLE FOR HIGH SPEED FAX: TELEPHONY CHANNEL FOUND UNSUITABLE FOR NEFAX 6000 MACHINE

EVALUATION RESULTS

TYPICAL APPLICATIONS

- MANAGEMENT-TYPE MEETINGS CONCERNED WITH PROJECTS IN THE PLANNING, DESIGN OR IMPLEMENTATION STAGES

- SEMINARS ON ONTARIO GOVERNMENT POLICY ISSUES

- MEDICAL CONSULTATION AND PATIENT INTERVIEWS IN PSYCHIATRY

- MEDICAL SEMINARS TO "TECHNICALLY ISOLATED" PROFESSIONALS IN NORTHERN ONTARIO

EVALUATION RESULTS

INCREASED AWARENESS:

- TEN (10) MINISTRIES

- OVER 200 GOVERNMENT PERSONNEL PARTICIPATED IN DEMOS, SEMINARS AND BUSINESS-TYPE MEETINGS

EVALUATION OF SECURITY EQUIPMENT

OAK COMMUNICATIONS' EQUIPMENT MUST

- BE DESIGNED TO A WIDER SPECIFICATION, SO THAT IT CAN RELIABLY PROCESS SIGNALS THAT EMANATE FROM OTHER THAN BROADCAST SYSTEMS

- BE CAPABLE OF FUNCTIONING FROM THE SITE OF THE TELECONFERENCE RATHER THAN FROM THE ACTUAL RF TRANSMITTING SITE

- NOT BE LIMITED TO SATELLITE TRANSMISSION ALONE, BUT MUST HAVE THE CAPABILITY OF PROCESSING SIGNALS FOR TERRESTRIAL TRANSMISSION SYSTEMS AS WELL

PARTICIPATION IN THE ANIK B PROGRAM ASSISTED O.M.G.S. IN LEARNING THAT

- TELECONFERENCE IS A VIABLE SERVICE FOR USE BY ONTARIO GOVERNMENT PERSONNEL

- SERVICE VIA SATELLITE IS MUCH MORE RELIABLE THAN WHAT THE CARRIERS CAN PRESENTLY OFFER IN THE WAY OF VIDEO TELECONFERENCING

- EARTH-STATION-SHARING IS OPERATIONALLY FEASIBLE AND ECONOMICALLY DESIRABLE

- PROPER HUMAN AND FINANCIAL RESOURCING ARE ESSENTIAL FOR ACHIEVING ANY MEASURE OF SUCCESS

THE ANIK B PROGRAM, THROUGH THE PARTICIPATION OF O.M.G.S., HELPED

- LAUNCH THE TELEMEDICINE PROGRAM OF THE ONTARIO MINISTRY OF HEALTH

- CREATE INTEREST IN THE PRIVATE SECTOR

2T-1E EVALUATION OF A 90 MBIT DIGITAL LINK

- Telesat Canada/Trans-Canada System - (TCTS)

Presentation by:

D. Gray
Engineer, Heavy Route
Message and TV Systems
Systems Engineering Group
Telesat Canada

and

A. Lintner
Senior Engineering Associated
Network Development Operations
Trans-Canada Telephone System

ANIK "C" FIELD TRIAL

TCTS RESEARCH PROJECT 81-07

OBJECTIVES

PHASE I — VERIFY DESIGN & OPERATIONAL INTEGRITY OF EARTH STATIONS.

— CORRECT ANY PROBLEMS IDENTIFIED.

PHASE II — EVALUATE THE OPERATION OF DIGITAL SWITCHING MACHINES INTERCONNECTED BY THE DIGITAL SATELLITE FACILITY.

— CHARACTERIZE THE TRANSMISSION PERFORMANCE OF THE DIGITAL SATELLITE FACILITY.

— IDENTIFY AND RESOLVE ANY PROBLEMS ENCOUNTERED.

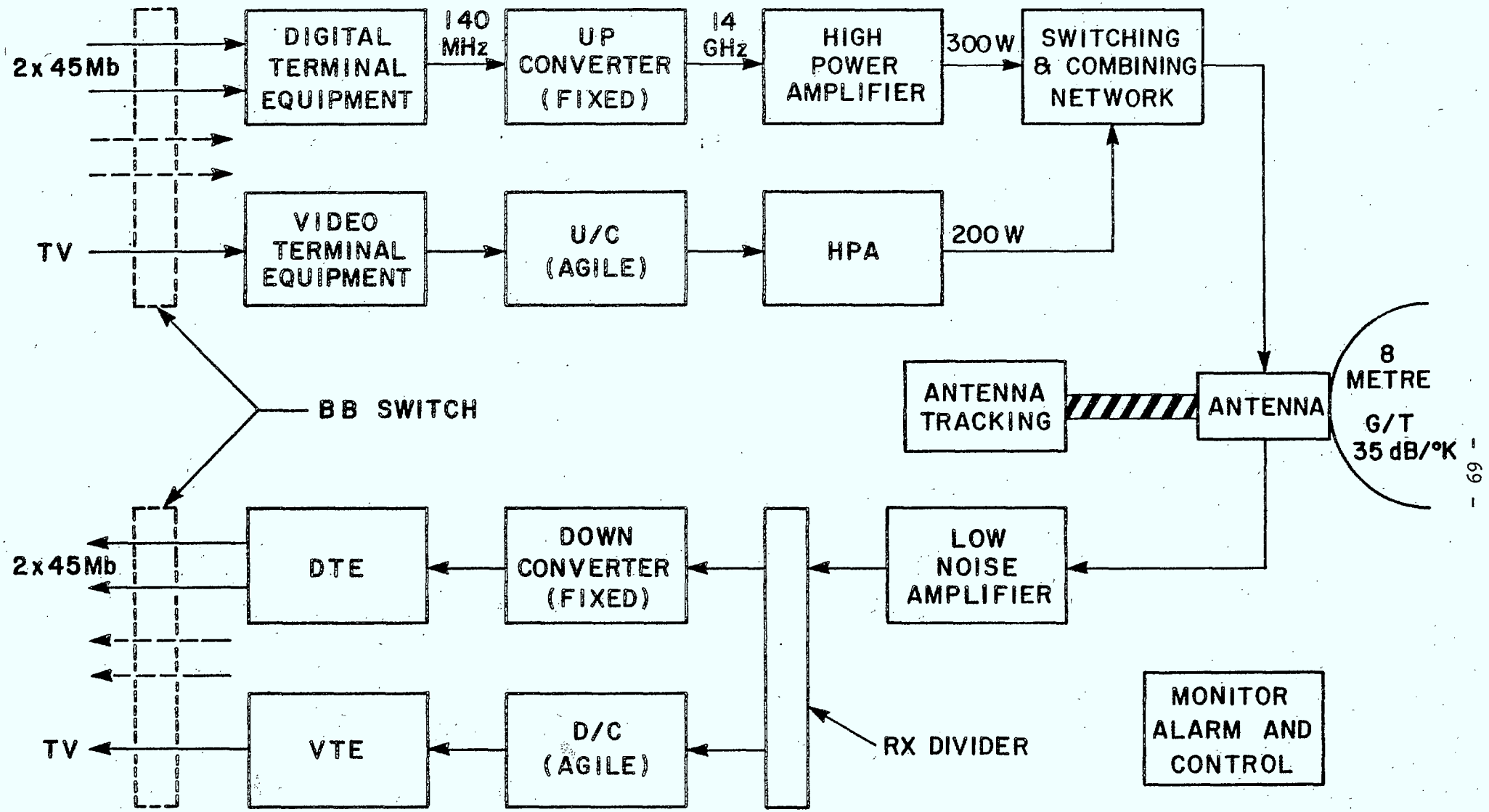


FIGURE 2: EARTH STATION BASIC BLOCK DIAGRAM

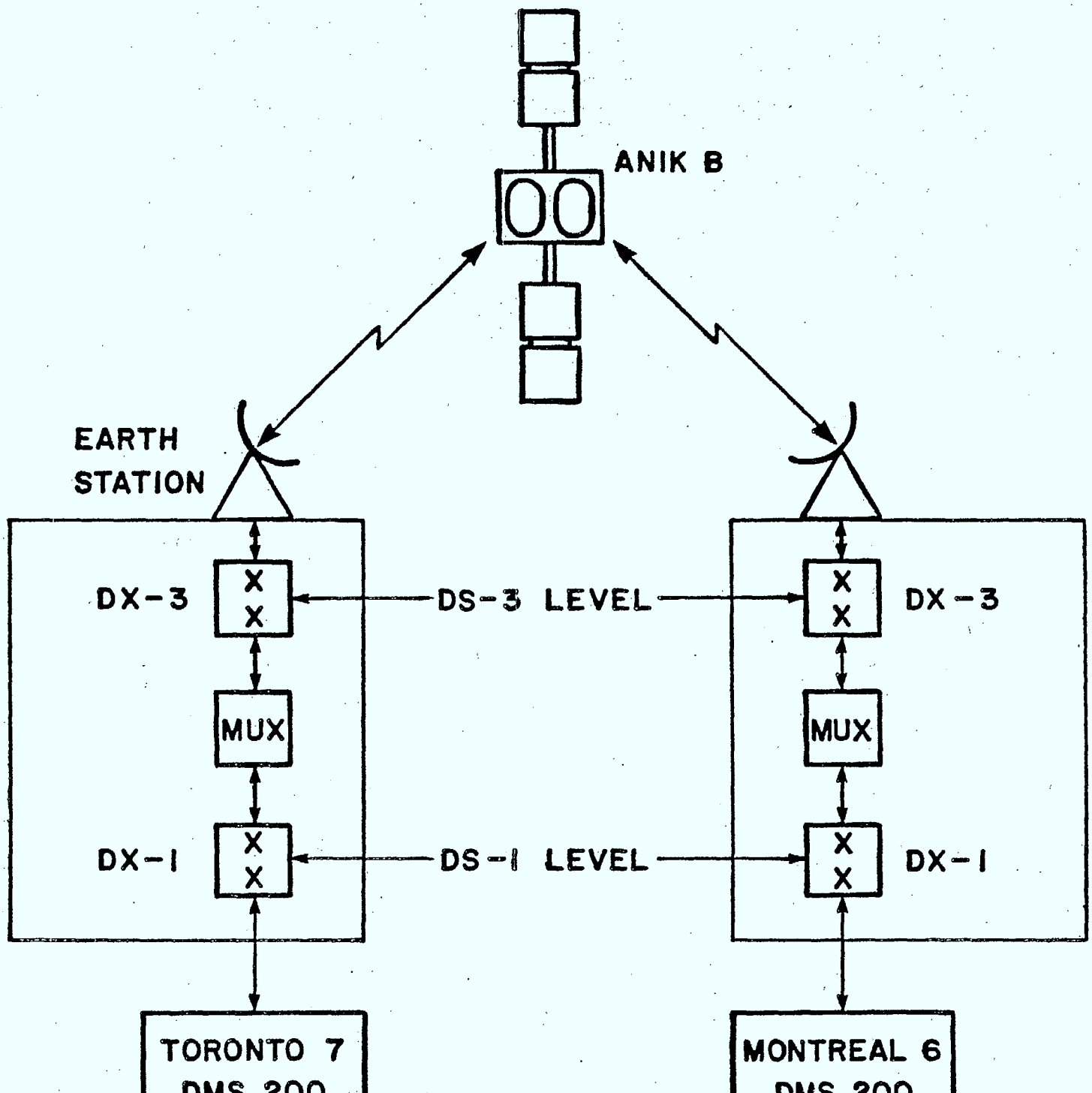


FIGURE 13

FIELD TRIAL CONFIGURATION

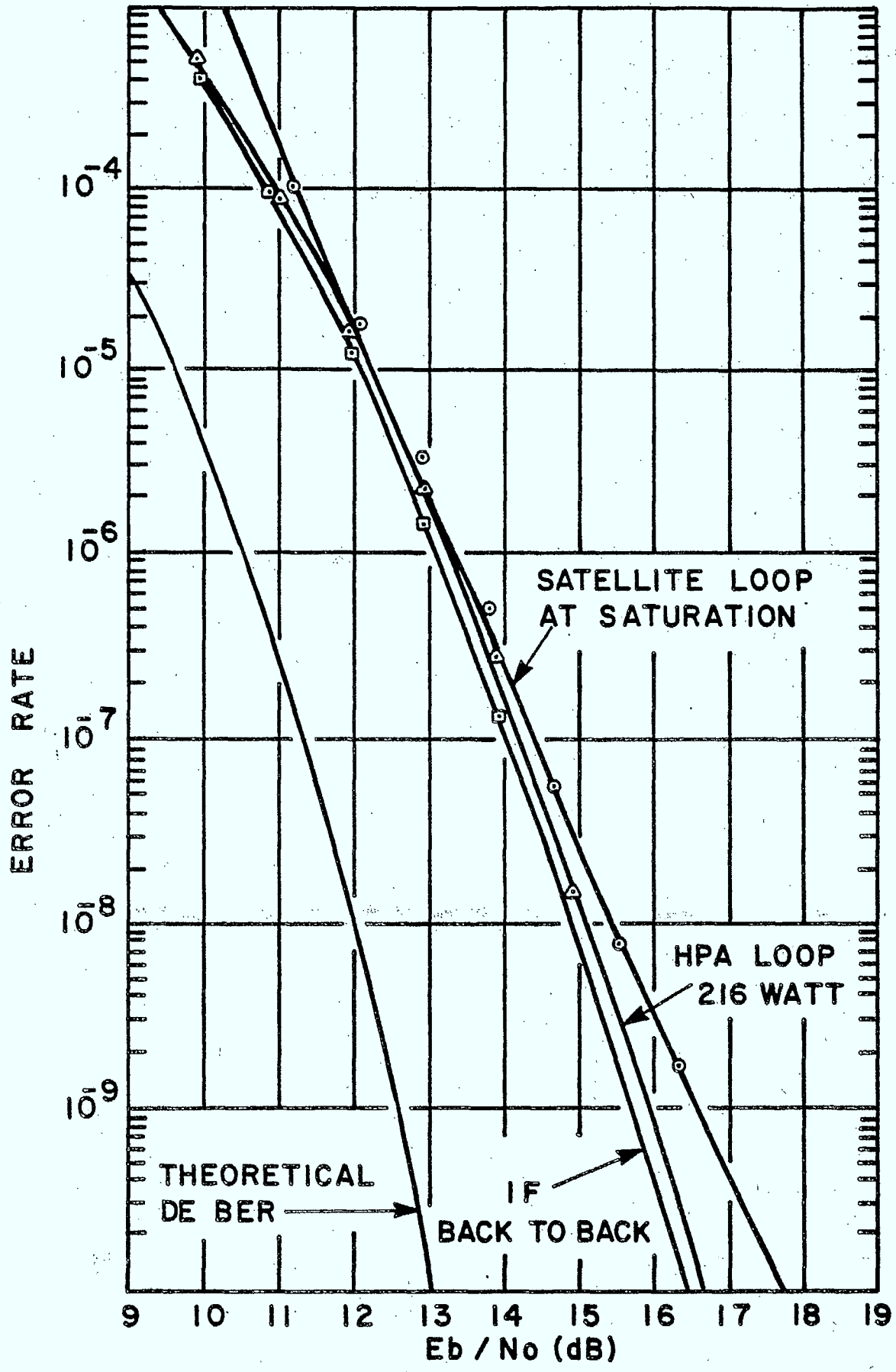


FIGURE 12- RESULTS FROM THE FIELD TRIALS OVER ANIK B FROM MONTREAL, BER VERSUS Eb/No

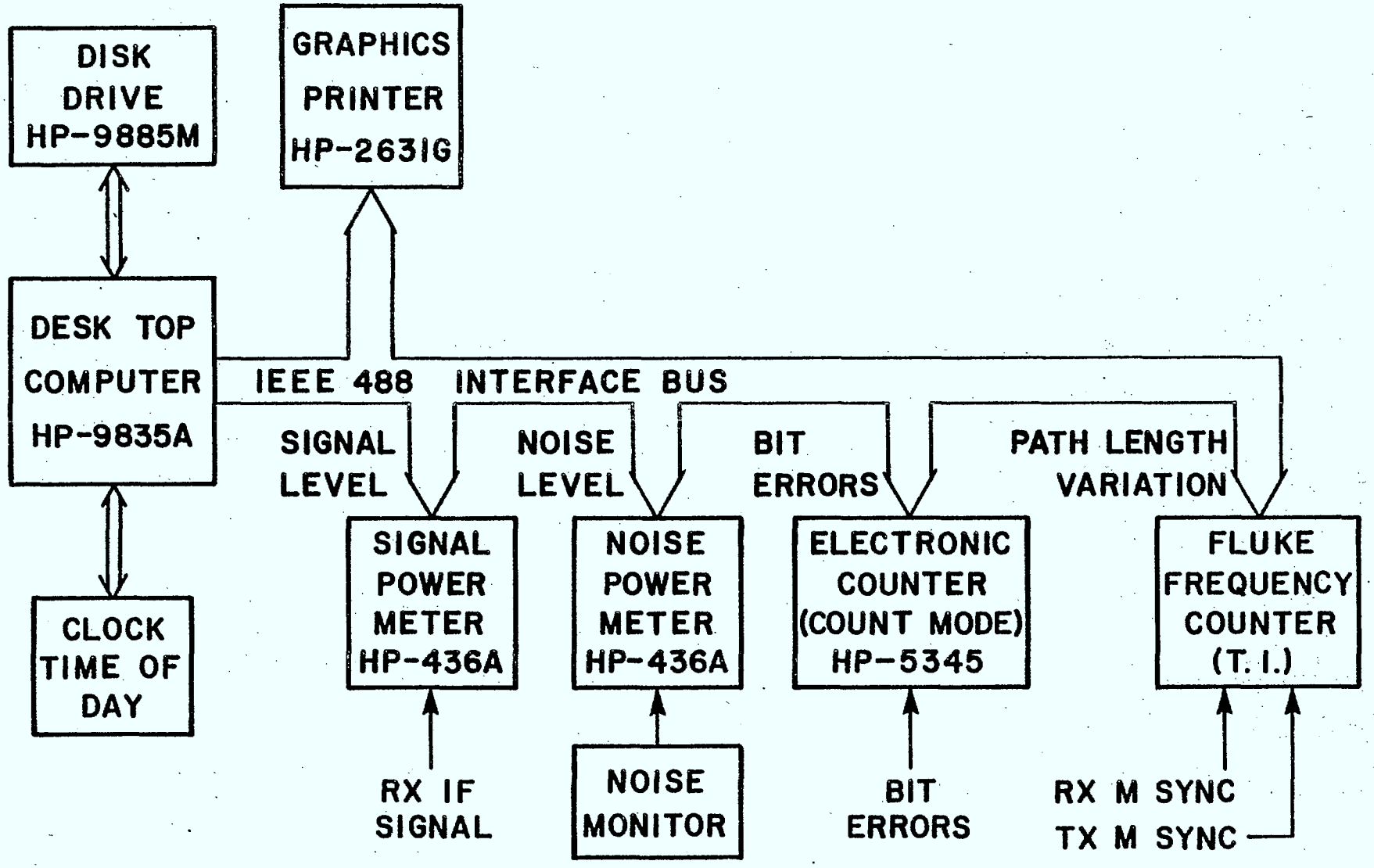


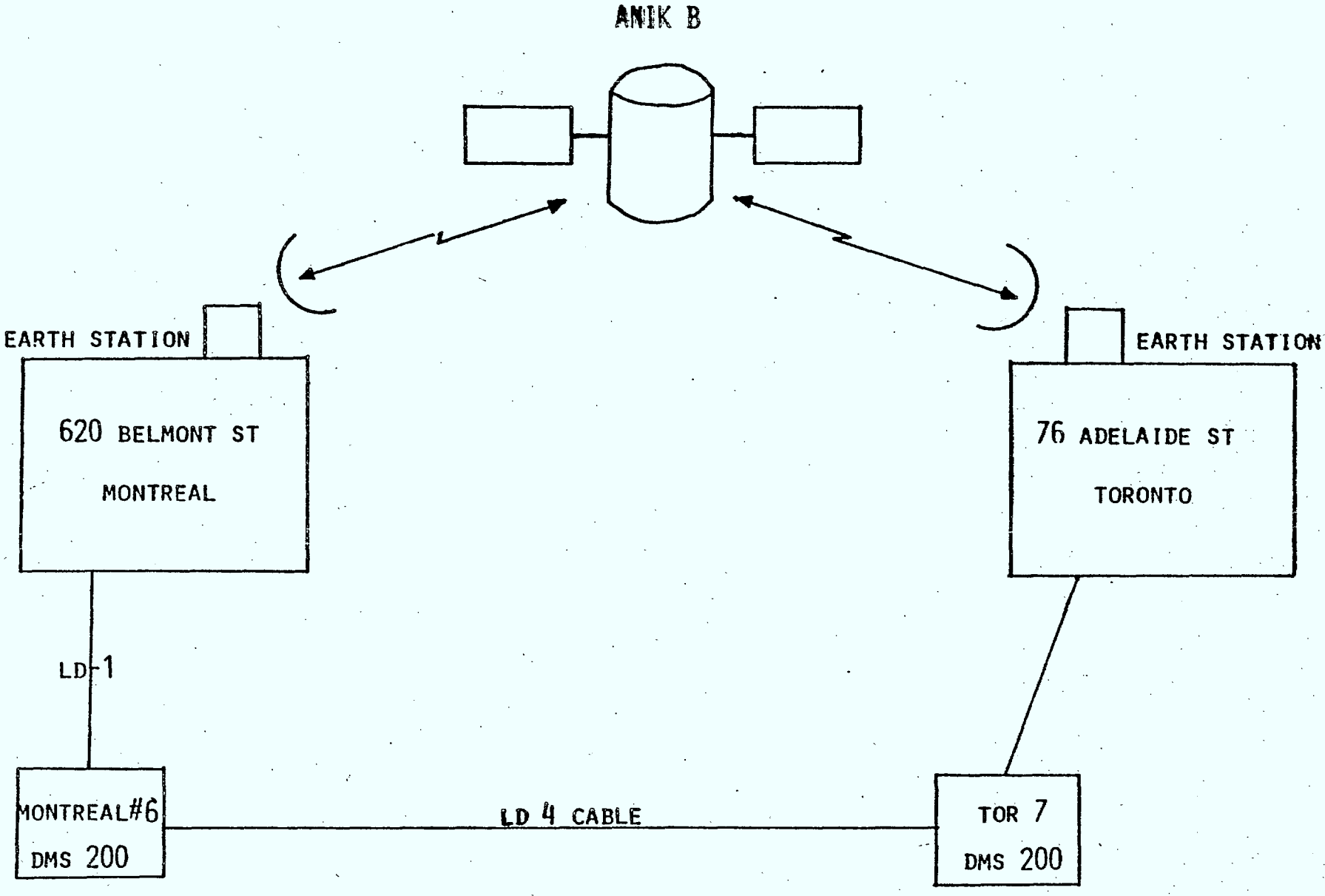
FIGURE 15 BLOCK DIAGRAM FOR DESK TOP COMPUTER PHASE II ; TORONTO, ANIK B SATELLITE LINKS

PRIMARY OBJECTIVES OF ANIK C FIELD TRIAL

USING THE ANIK B SATELLITE

PHASE I IDENTIFY DESIGN DEFICIENCIES TO BE CORRECTED PRIOR TO SERVICE (TELESAT).

PHASE II EVALUATE THE INTEGRATION OF THE ANIK C SATELLITE SYSTEM WITH THE TCTS TERRESTRIAL NETWORK (TCTS/T).



FIELD TRIAL LAYOUT
FOR TATS TESTING

TRAFFIC OPERATIONAL MEASUREMENTS

	SATELLITE	TERRESTRIAL
CALLS ATTEMPTED	13032	13150
OUTGOING FAILURES	44	80
INCOMING FAILURES	9	2
PREROUTE ABANDON	26	7
TOTAL CALL FAILURES	79	89
GLARE OCCURRENCES	70	16
% FAILURES OF ATTEMPTED	0.61%	0.68%
IN SERVICE EXPERIENCE		0.8%

TRAFFIC FACILITY MEASUREMENTS

NO CGA, BPV, FRAME LOSS

CARRIER SLIPS: MACHINES SYNCHRONIZED - TERRESTRIAL 0;SATELLITE 1

MACHINES UNSYNCHRONIZED - 1 SLIP EVERY 3 HOURS

TEST RESULTS - TRANSMISSION (SATELLITE FACILITY)

	MEASUREMENT INTERVAL (SEC)	ERROR SECONDS	NUMBER OF ERRORS	BER	%EFS
MONTREAL TO TORONTO	205397	41	309	$3.4X10^{-11}$	99.98
TORONTO TO MONTREAL	205421	102	403	$4.4X10^{-11}$	99.95

PHASE JITTER: 22 -23° DS-3, 21° DS-1

OBJECTIVES: BER - $<10^{-7}$ 99% OF THE TIME, PHASE JITTER<109°DS-3;<83°DS-1

SIMULATED FADING

- TO OBSERVE OPERATION OF SWITCHING AND MULTIPLEX EQUIPMENT IN THE PRESENCE OF DEGRADED SIGNAL
- TRANSMIT POWER REDUCED TO OBTAIN BER'S OF 10^{-5}, 10^{-4}, 10^{-3}
- 10^{-5}, 10^{-4} HAD NO EFFECT AS INDICATED BY OPERATIONAL MEASUREMENTS
- 10^{-3} CAUSED FREQUENT FRAME LOSS (<1 PER MINUTE). SEVERAL PREROUTE ABANDON INDICATIONS DUE TO ERRONEOUS SIGNALLING
- VERY HEAVY RAINFALL (>4.0 IN (100 MM)/HOUR) WOULD CAUSE 10^{-3} BER FOR ABOUT 10.5 MINUTES PER YEAR
- AT NO POINT DID CGA OPERATE TO INDICATE SYSTEM WAS COMPLETELY INOPERABLE

CONCLUSIONS

- FIELD TRIAL WAS AN UNQUALIFIED SUCCESS
- DIGITAL SWITCHING SYSTEM INTEGRATED WELL WITH DIGITAL SATELLITE FACILITIES
- MINOR DIFFICULTIES ENCOUNTERED DUE ONLY TO LACK OF KNOWLEDGE OF SOME OPERATIONAL REQUIREMENTS
- TECHNICAL & OPERATIONAL COMPATIBILITY SUCCESSFULLY DEMONSTRATED
- PERFORMANCE OBJECTIVES OF SYSTEM WERE MET OR EXCEEDED

Anik Project T1/2T-1E

"Evaluation of a 90 Mbit Digital Link"

Publications

1. "Implementation of Digital Communication Link on the Anik C Satellite System", A.E. Winter, D.A. Gray. Presented at Fifth International Conference on Digital Satellite communications, March 1981, Genoa, Italy.

2. "Evaluation of a 14/12 GHz 90 Mbit Digital Satellite Link", D.A. Gray, to be presented at NTC '81, New Orleans, Nov/Dec 1981.

3. "Evaluation of a 14/12 GHz 90 Mbit digital Satellite Link at the Facility between Digital Switches", P.A. Brown, to be presented at NTC '81, New Orleans, Nov/Dec 1981.

2T-2E SLIM TDMA

- DOC/CNCP Telecommunications -

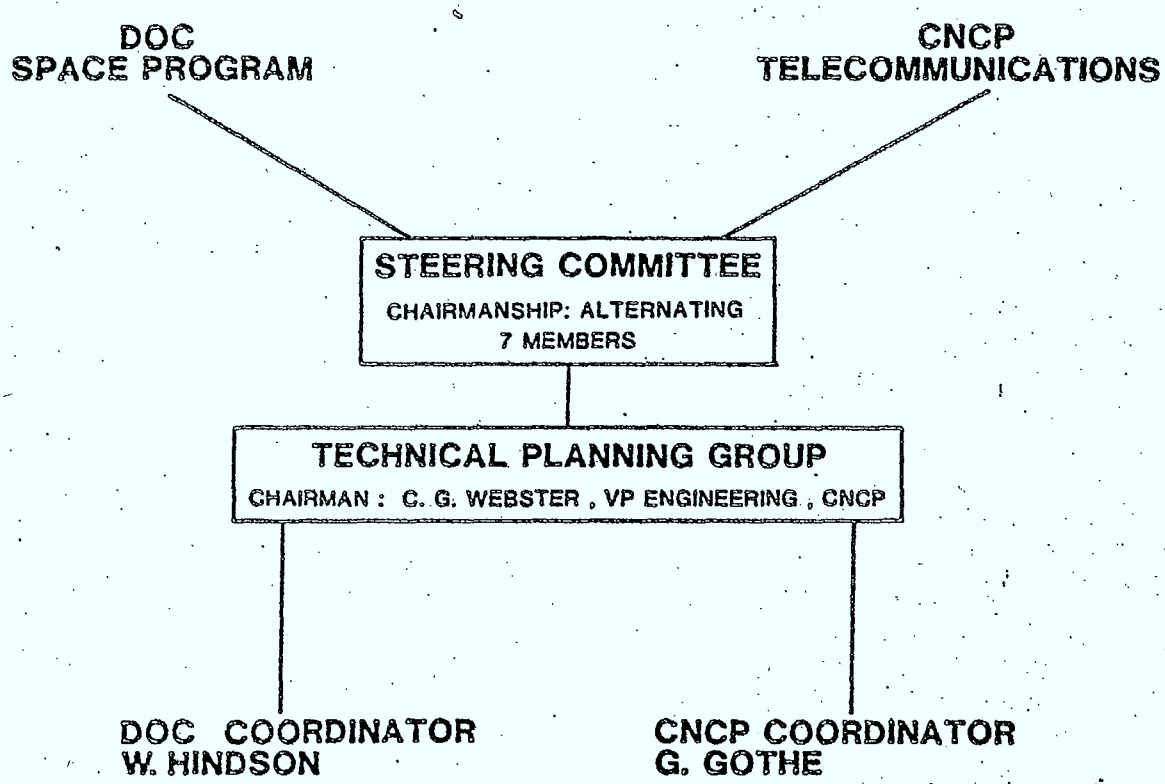
Presentation by:

G. Gothe
Planning Engineer
Customer Systems
CNCP Telecommunicatio

T2 - SLIM TDMA

SPONSORED BY

DOC / CNCP TELECOMMUNICATIONS



OBJECTIVES

- Support Canadian Industry in Development of Medium Capacity (SLIM) TDMA Equipment

- Establish System Design Parameters

- Evaluate Performance Achievable for Data, Voice, Video and Facsimile

- Test Terrestrial Interconnection/Interworking

- Alert Policy Makers, Regulators

PRESENT STATUS

- All Four Stations Operating

- Modifications to TDMA made to fit Operating environment

- Four-station System Operation needs Fine-Tuning of Parameters

- Phase II (Customer Trials) will proceed with Central Control of TDMA Stations

- High Cost of Completely Hitless Reconfiguration made funding of development impossible for DOC or CNCP in this Phase (I & II) of project.

2T-2E SLIM TDMA

Project Title: SLIM TDMA

Sponsors: Department of Communications
Canadian National/Canadian Pacific

Management

Overall direction of the Project is provided by the Steering Committee, consisting of management and engineering representatives from DOC and CNCP, a marketing representative from CNCP, a project representative from DOC and a secretary. Chairmanship alternates between the Director General, Space Technology and Applications (DOC) and the Vice-President, Planning (CNCP).

The Technical Planning Group, chaired by the Vice-President, Engineering (CNCP) is a subcommittee of the Steering Committee.

Project Co-ordinators were W. Hindson for DOC, and G. Gothe from CNCP.

Objectives

The objectives of the SLIM TDMA Pilot Project are:

a) Support Canadian Industry in development of Medium Capacity (SLIM) TDMA Equipment.

b) Establish system design parameters.

c) Evaluate performance achievable for data, voice, video and fascimile.

d) Test terrestrial interconnection/ interworking.

e) Investigate new applications.

f) Alert Policy Makers and Regulators.

Locations

Earth Stations are located in Kitchener, Toronto, Ottawa and Montreal.

For the Customer Trials of Phase II the Kitchener station will be moved to Bathurst, N.B.

All stations are in the Eastern Beam of ANIK-B.

Present Status

At present all four stations are in operation. Modifications have been made to the TDMA equipment, based on difficulties found at one station with induced interference, probably from the highly active environment of our Central Office in Toronto.

Further fine tuning of the variable TDMA operating parameters is in progress to maximize performance.

For Phase II customer trials TDMA controls will be remoted to one central Operations centre in CNCP headquarters. The equipment will be modified to enable its operation at full input/output port capacity.

The "hitless reconfiguration" feature originally planned for Phase II, was found to be more expensive than anticipated and it was beyond the means of either sponsor to make additional funds available. By reason of the nature of the planned customer trial and the present capability of the system, Phase II could be successfully completed without it.

As for "beam-switching" there is no technical reason making a demonstration necessary now, nor is there an operational opportunity to demonstrate it, due to the many pilot projects requiring resources, making beams other than the Eastern unavailable for long term use.

Both these features, "hitless reconfiguration" and "beam switching" will be necessary for Phase III.

Schedule

The present schedule is shown in Figure 1. The Project had been delayed by TDMA procurement difficulties and RF equipment failures.

Customer trials will include use of Remote Job Entry data traffic and a polling system. Both the Computer vendor and CNCP will endeavour to supply protocol adaption or conversion to counteract the effects of the satellite delay on Response Times and Net Data Throughput.

Teleconference will be used including participants via both satellite and terrestrial paths in the same conference.

Different types of facsimile will be transmitted via the TDMA and TDMA and SCPC in tandem.

We will also include an "Infotex" terminal to connect via the TDMA to the Infotex computer and communicate to itself and to Telex machines.

Future Plans

It is planned that based on the results of the Phase I and Phase II tests procurement specifications will be produced for operational, service-offering equipment, including central control, customer control over his leased aggregate capacity and dynamic assignment. This equipment will be useable over ANIK-C, to cover all of Canada.

Addition of switching equipment is under study.

SCHEDULE

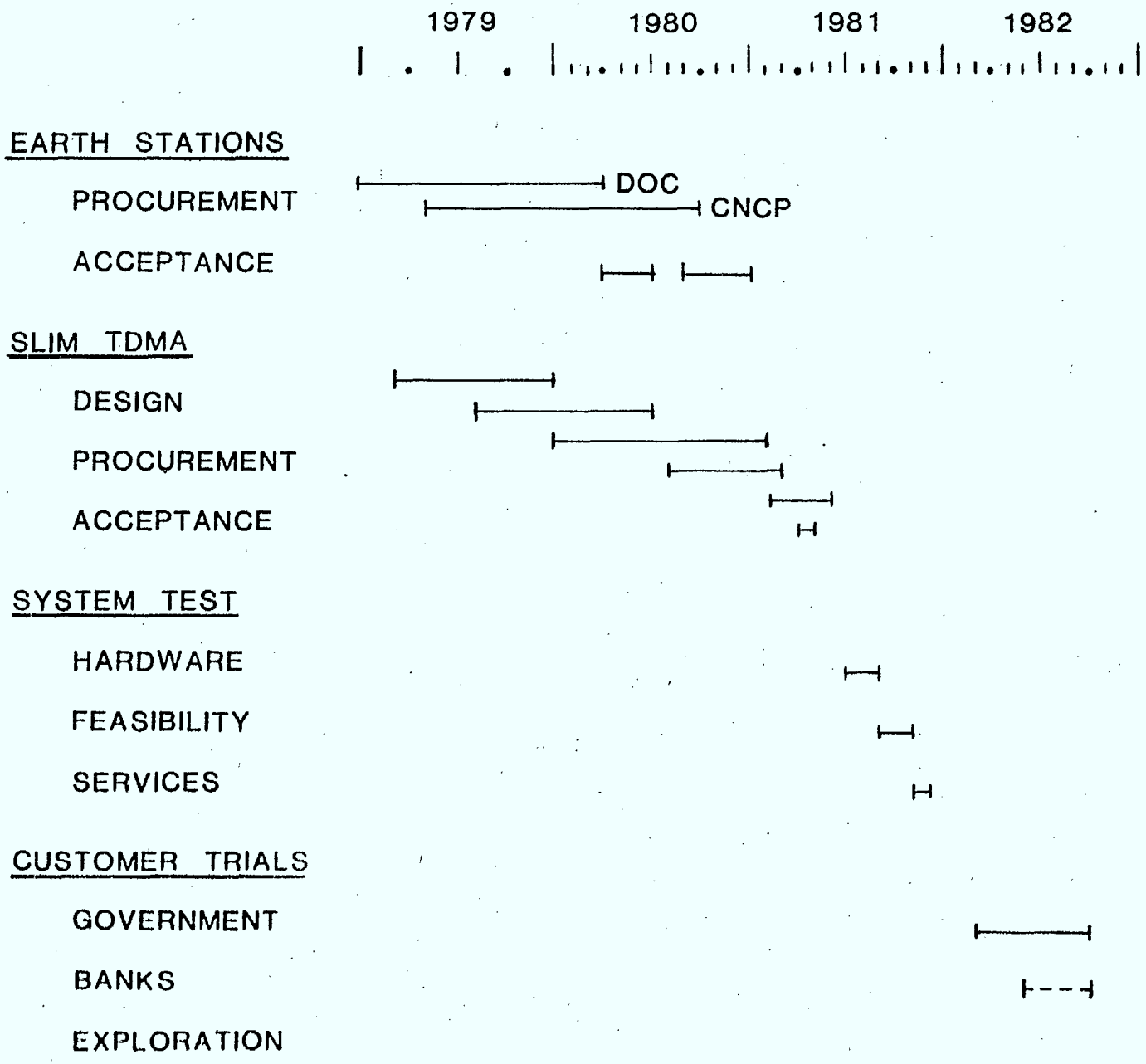


FIGURE 1

2T-3E PHASE COHERENT LONG BASELINE INTERFEROMETER FOR GEOPHYSICAL APPLICATIONS

- University of Toronto -

Presentation by:

J.L. Yen
Professor
Dept. of Electrical Engineering

2T-3E PHASE COHERENT LONG BASELINE INTERFEROMETER FOR GEOPHYSICAL APPLICATIONS

J.L. Yen, W.H. Cannon, W. Petrachenko, S.K. Knowles, W.B. Waltman, J.A. Galt, J.A. Popelar

The objectives of the project are to refine the technique of synchronization of remote oscillators by satellite phase link and to establish the precision of the phase coherent long baseline interferometer for length of day and other geophysical measurements. The detailed methodology is described in the progress report presented at the ANIK-B users meeting June 5, 1980. At present the principal short term objectives have been fulfilled and routine observations are to be continued for long term evaluation of the method. As a consequence of this pilot project the Canadian Time Service of the National Research Council has adopted the satellite phase link as their principal future means of international clock intercomparison. In addition to the main objectives, a new technique using a satellite relayed pilot tone for precision measurement of surface contours of large reflector antennas has recently been explored. The method appears to have potential use in the set-up of all large ground station antennas for satellite communications systems. A brief summary of the phase link geophysical measurement results are given below.

The accuracy of the phase link is limited by thermal noise and co-channel interference in the communications channel and by path length variations due to the ionosphere and troposphere. To a certain extent, the short term stability is mainly governed by the communications channel while the long term error is principally controlled by propagation effects. The variance of a typical path including two clocks and the phase link is about 25 picoseconds for 0.1 second samples. This value is quite adequate for the present purpose, but it is believed that improvement can be made for more stringent applications. The long term performance of the link cannot be easily measured because of the difficulty in separating the phase difference between clocks at two stations from the link error. One possible measure is the sum of the phase differences between each pair of three stations or the phase closure. For a perfect system this sum should vanish. A preliminary 24 hour closure phase evaluation results in a 1.1 nanosecond error. The discrepancy was traced to an operational error which was corrected in subsequent observations. Another performance measure is the Allen variance of the two clocks and the link combined. This is found to decrease from about 3×10^{-10} for 0.1 second sampling interval to 7×10^{-13} for 100 minutes beyond which it increases. Given that a rubidium frequency standard is the weakest member of this experiment and that their Allen variances typically turn up at few tens of minutes, it is clear that the phase link can be used to synchronize remote rubidium standards.

The purpose of the satellite phase link in this project is to correct the phase of remote oscillators in a long baseline interferometer for geophysical measurements. Without the phase link the accuracy of long baseline interferometer measurements are controlled not only by signal-to-noise ratio and path length variations of the interferometer but also by the clock errors. The clock error can to a certain extent be corrected by fitting a clock error model. In this project the clock error is removed by the phase link and the path length error corrected by observing at two frequencies. As a result the accuracy of the measurement should be depended on the signal-to-noise ratio alone. Present results indicate the system is capable of resolving day-to-day variations in earth rotation with an r.m.s. error of the order of 266 sec in UTI-UTC. This is within the expected range of the project. Further fine tuning is expected to further improve the performance.

2D-1 TRANS-CANADA AMATEUR RADIO PACKET NETWORK

- Canadian Amateur Radio Federation -
(CARF)

Presentation by:

H. Pett
Canadian Amateur Radio Federation

2D-1 CANADIAN AMATEUR RADIO FEDERATION

Project Title: Trans-Canada Amateur Radio Packet Network

Project Manager: H. Pett

The Trans-Canada Amateur Radio Packet Network began as pure serendipity, with my presentation on amateur radio packet networks to the First Global Conference on the Future in Toronto last year. One month later, the two major amateur radio groups in Canada, the Canadian Amateur Radio Federation and the Canadian Radio Relay League, had co-sponsored an application to experiment with a radio-telephony channel on ANIK-B, to connect existing packet networks in Vancouver and Ottawa. Each city had a team of about five people, from diverse technical backgrounds.

We received word on May 12 that we could begin our experiment. After verifying that the radio emissions from our equipment would not interfere with other activities, on July 3 we performed a loop test of the satellite link. This verified that data could be sent from a computer terminal at Shirley's Bay, to the Vancouver earth station at the Knowledge Network, where it was received by a computer, turned around and sent back to Shirley's Bay.

Then began the long process of integrating two totally dissimilar packet protocols, Vancouver's (SDLC, by the synchronous, interrupt driven) and Ottawa's (polled, asynchronous, no interrupts) into the Vancouver micro-computer board we had elected to use at both ends of the link. The first tests of the integrated system were conducted on August 14, with first contact on August 28.

There were two major objectives for this experiment:

1) prove that the telephony channel would support packet communication using standard components.

2) link radio amateurs in Vancouver and Ottawa, operating from their homes.

By September 9, objective 1) had been fully met, and 2) partially. The Ottawa network was not successfully handling the packet traffic, enabling use from personal stations (at home). On September 28, we achieved 100% of our objectives by maintaining contact for 1½ hours, with no outages, and with steady traffic, from a home in Vancouver to one in Ottawa. This ended our experiment.

Why is all this significant?

Radio amateurs have for decades been in the forefront of experimentation with new technologies; also, we have been very active providing emergency and personal communications services.

In the near future, many people will own or have access to computer terminals and equipment. They will be looking for ways to communicate among themselves. By linking Community Bulletin Boards, personal databases, and other non-profit facilities together, a totally new dimension of rapid, reliable, free communication will be opened up. Satellites will hopefully play a role, by joining distant networks together.

Perhaps, this decade, almost anyone will be able to send a message almost anywhere in the world, using local networks linked by satellites. We have now taken the first hesitant step toward that goal.

Our experiment is over. It worked. The amateur radio groups involved are currently seeking a satellite facility (or facilities) we could share with an existing channel user (on a non-priority, interruptable basis). It could be any kind of channel: TV, telephony, whatever. We have the technical expertise to provide any mode of signal, at whatever frequency is required. In fact, we have conducted successful experiments in using low-level signals injected into wide-band signals such as TV, with absolutely no interference to the primary user.

If anyone here today knows of such a channel we might share, please get in touch with me.

Hugh Pett (VE3FLL)
36 Lismer Crescent,
Kanata, Ontario
K2K 1A2
613-592-2331 (home)

2D-2 EVALUATION OF DIGITAL SYSTEM PERFORMANCE

- University of Ottawa -

Presentation by:

K. Feher
Professor
Faculty of Science & Engineering

UNIVERSITÉ D'OTTAWA UNIVERSITY OF OTTAWA

OTTAWA ONTARIO
CANADA K1N 6N5

FACULTÉ DES SCIENCES ET DE GÉNIE
GÉNIE ÉLECTRIQUE

FACULTY OF SCIENCE AND ENGINEERING
ELECTRICAL ENGINEERING

ANIK-B USERS MEETING

OTTAWA - OCTOBER 28, 1981

NEW DIGITAL MODULATION TECHNIQUES FOR POWER AND SPECTRAL EFFICIENT LOW COST EARTH STATIONS

PROJECT MANAGER
Dr. KAMILO FEHER, P.Eng.

Prof. Elect. Eng.
University of Ottawa
Ottawa, Ontario
Canada K1N 6N5
Tel: 613-231-2288
Dept. Secretary:
613-231-2495

Sponsors

- NSERC
- SPAR Aerospace

DIGITAL COMMUNICATIONS GROUP

DCG - DR. K. FEHER - CO-ORDINATOR

OBJECTIVE

1. TO EVALUATE ON ANIK-B THE PERFORMANCE OF NEW POWER-EFFICIENT DIGITAL MODULATION TECHNIQUES DISCOVERED BY OUR DCG TEAM.

2. THESE NEW MODULATION TECHNIQUES KNOWN AS INTERSYMBOL-INTERFERENCE AND JITTER-FREE -

   IJF-OKQPSK OR FEHER'S MODEMS

   HAVE AN EXCELLENT BER PERFORMANCE, I.E.

   $$P_E = 10^{-8} \text{ FOR } E_B/N_0 = 14 \text{ dB}$$

   AND ARE MORE SPECTRAL EFFICIENT THAN EXISTING TECHNIQUES.

3. EARTH STATION HPA WILL OPERATE IN A SATURATED MODE, THUS SIGNIFICANT COST SAVINGS ARE ANTICIPATED.

4. MORE 64 KBIT/SECOND SATELLITE CHANNELS WILL BE TRANSMITTED WITH SMALLER EARTH STATIONS.

5. FASTER CARRIER AND SYMBOL SYNCHRONIZERS AND ORIGINAL IN SERVICE MONITORS WILL SIGNIFICANTLY IMPROVE THE EFFICIENCY OF PRESENT SYSTEMS.

6. NEW DIGITAL SYSTEM CONCEPTS AND CONFIGURATIONS FOR TELEPHONE COMPANIES, BANKS, BROADCASTING COMPANIES, DEFENCE, INSURANCE COMPANIES, GAS-OIL UTILITIES, HEALTH/EDUCATIONAL INSTITUTIONS WILL BE EVALUATED.

EXPERIMENTAL REQUIREMENTS

DURING 1981 - 1985

THE UNIVERSITY OF OTTAWA - DCG OWNED 5-MM ANTENNA (15 WATT) 14/12 GHz EARTH STATION WILL BE USED FOR OUR EXPERIMENTS.

PERTINENT REFERENCES INCLUDE:

T. Le-Ngoc, K. Feher, H. Pham-Van: "New Modulation Techniques for low-cost power and bandwidth efficient satellite earth stations", accepted for publication in the IEEE Transact. on Communic., Scheduled for January, 1982 (manuscript has 45 pages)

D. Morais, K. Feher: "The Effects of Filtering and Limiting on the Performance of QPSK, Offset QPSK and MSK Systems", IEEE Transact. on Communic., December, 1980 (pp. 1999-2009).

H. Pham-Van, K. Feher, "A Class of two-symbol interval modems for nonlinear radio channels", Proc. of the IEEE National Telec. Conference, NTC-81, New Orleans, November 29-30, 1981.

T. Le-Ngoc, K. Feher: "Performance of new IJF-OQPSK modulation schemes in the presence of noise, interchannel and cochannel interference", Proc. of the IEEE National Telecom. Conference, NTC-81, New Orleans, November 29-December 3, 1981.

REFERENCE BOOKS

K. FEHER: DIGITAL COMMUNICATIONS: Microwave Applications - Prentice-Hall, Inc., Englewood Cliffs, N.J., 07632, U.S.A., 1981

This is one of the first books to offer a complete description and practical application of digital communications. The described data transmission techniques may also be applied to satellite, cable, wire and optical fiber systems.

Illustrated:

Over 100 illustrations and photographs of original measurement results and of hardware relate the concepts and ideas of system design to state-of-the-art operational and planned U.S., Canadian, Japanese, and other systems.

Includes Chapter by Dr. Adam LENDER & Dr. W. Woeler

DIGITAL MODULATION TECHNIQUES IN AN INTERFERENCE ENVIRONMENT

by Dr. Kamilo Feher

This valuable handbook will be of interest to practising engineers, scientists, and management personnel who may be confronted with modern digital transmission problems. It will be useful in particular to system designers who must know the capabilities of the rapidly expanding field of digital modulation, to equipment designers who build the systems and to system users who specify the performance of digital communication systems in an interference environment.

Published in 1977 by Don White Consultants Inc., Gainsville, Virginia, 22065, State Route 625, P.O. Box [illegible]

A FORTHCOMING BOOK

K. Feher, "Digital Communications: Satellite/Earth Station Engineering", Prentice Hall, Inc., December 1982.

This book contains chapters by Dr. S.J. Campanella, D. Schaefer, W. Tranter and L. Franks

These books are available directly from the publishers or from the University of Ottawa Bookstore.

DIGITAL COMMUNICATIONS GROUP

D C G

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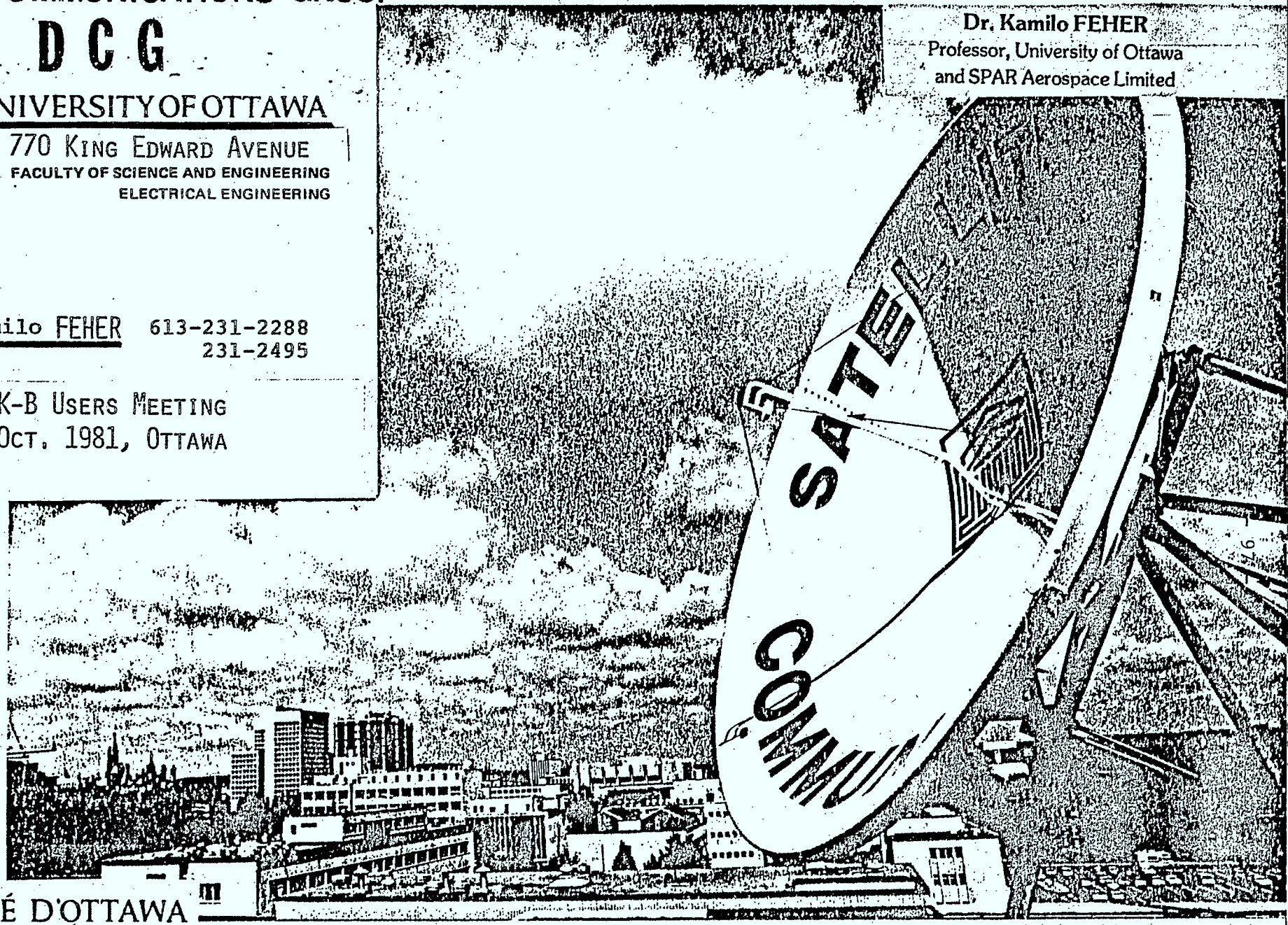
ELECTRICAL ENGINEERING

Dr. Kamilo FEHER 613-231-2288
231-2495

ANIK-B USERS MEETING
28 OCT. 1981, OTTAWA

Dr. Kamilo FEHER
Professor, University of Ottawa
and SPAR Aerospace Limited



UNIVERSITÉ D'OTTAWA

Photograph of the 14/12 GHz satellite earth station antenna of the University of Ottawa. The satellite earth station, 2 GHz terrestrial line of sight microwave link and the well equipped digital communications laboratory of the DCG provide a unique experimental facility for inventive digital communications systems and computer communications research and development in modulation, coding and signal processing. The satellite experiments are performed under the direction of Dr. K. Feher.

UNIVERSITÉ D'OTTAWA UNIVERSITY OF OTTAWA

OTTAWA ONTARIO
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FACULTÉ DES SCIENCES ET DE GÉNIE
GÉNIE ÉLECTRIQUE

FACULTY OF SCIENCE AND ENGINEERING
ELECTRICAL ENGINEERING

To Receive The

DIGITAL COMMUNICATIONS R&D NEWSLETTER

OF THE

DIGITAL COMMUNICATIONS GROUP (DCG)

AND ADDITIONAL INFORMATION ABOUT

OUR ONGOING R&D PROJECTS, SHORT

COURSES ON-CAMPUS AND OFF-CAMPUS

PLEASE CONTACT

Dr. Kamilo FEHER, P.Eng.
Prof. Elect. Eng.
University of Ottawa
Ottawa, Ontario, Canada K1N 6N5
Tel: 613-231-2288

2D-3 AUSTRALIAN DOMSAT SUPPORT ACTIVITY

- Department of Communications -

Presentation by:

W. Threinen
Project Manager

2D-3 AUSTRALIAN DOMSAT SUPPORT ACTIVITY

Project Title:	Australian DOMSAT Support Activity
Project Sponsor:	Department of Communications on behalf of Canadian Industry
Project Objectives:	to undertake demonstrations and trials to support Canadian industry to bid for supply of services and equipment for the Australian National Communications Satellite System (DOMSAT)

Schedule Overview

Summer 1979	-	Demonstrations of satellite communications in Australia through HERMES
1980 - 1981	-	Demonstrations of satellite communications through ANIK-B to many influential Australian visitors to Canada.
September 1980	-	Approval received for DOC program of technical support to Canadian industry to tender on DOMSAT.
October 1980	-	Australian government agencies issue RFT's for 14/12 GHz satellite communications system.
Spring 1981	-	Raytheon Canada, SED Systems and Spar Aerospace tenders to Australia and to potential prime contractors for space segment subsystems and for earth terminals.
1982	-	Initial contracts from Australian government agencies anticipated.
1983	-	RFT's from Australian private sector anticipated.

Details of Experiments

Fall 1980	-	Raytheon Canada investigation of specific equipment requirements associated with satellite delivery of PAL-B TV: ANIK-B satellite and modified ANIK-C earth stations.
Winter 1980/81	-	DOC tradeoff investigation of SCPC and sub-carrier approach to delivery of several radio carriers with video signal transponder: ANIK-B satellite simulator.
Fall 1981	-	Raytheon Canada investigation of a dual earth station antenna system for reception of TV: ANIK-B satellite and modified ANIK-C stations.
Fall 1981	-	DOC(A) and ABC investigation of delivery of several radio carriers with PAL-B video signal in a single transponder: the ANIK-B satellite, CRC earth stations and Australia test facility.
Winter 1981/82	-	SED Systems test program to verify a proposed satellite telephony system design suited to commercial application in Canada and Australia.
1982	-	DOC evaluation of the next generation earth terminal manufactured by SED Systems for reception of TV and radio signals.
1982	-	DOC evaluation of pre-operational telephony/data terminals delivered by Spar Aerospace and SED Systems at completion of government supported development contracts.

Initial Assessment

The ANIK-B Communications Program and its predecessor the HERMES Experiments Program have:

i) assisted Australian government agencies in defining DOMSAT, and

ii) assisted Canadian industry in preparing and confirming tenders for DOMSAT.

2D-4 ASSOCIATION CANADIENNE D'EDUCATION DE LANGUE FRANCAISE (ACELF)

- Quebec Department of Education -

Presentation by:

Ms. G. Roquet
President

2D-4 "WITHIN HEARING"

Project Sponsors:
- Association Canadienne d'Education de langue française (ACELF)
- Department of Communications of Canada (DOC)
- Quebec Department of Communications (QDC)

Objectives:

The aim of the ACELF is to work for the development and expansion of French-language education and French culture in Canada. During the Quinquennalle de la francophonie canadienne (fifth conference of the French-Canadian community) held in August 1980, the ACELF was given the mandate to co-ordinate educational and community communication projects. The aim of this project is to give Francophones throughout Canada who are involved in the educational field an opportunity to get to know each other and to further their development. This project will also be an opportunity to explore the possibilities of satellite communications and to lay the foundation for a longer term communication infrastructure.

Participants:

The participants in the project will be universities, primary and secondary schools and CEGEPS. In addition, "Within Hearing" will be aimed at various educators and members of the community.

Location:

Initially, the project will involve six cities: St-Boniface (Manitoba), Ottawa, Sudbury, Chicoutimi, Moncton and Pointe-de-l'Eglise (Nova Scotia). Ottawa, Sudbury and Chicoutimi will be able to broadcast video signals but Moncton, Pointe-de-l'Eglise and St-Boniface will only be able to receive the video emissions. The latter locations will, however, be able to communicate with the transmitting station through a telephone line in the normal audio manner.

Description of the Project

Although the actual programming has yet to be finalized, it is reasonably certain that the universities in Chicoutimi, Sudbury and Ottawa will participate in the project by providing courses for which there is a demand. The programs should start in mid-February 1982 and end in mid-September of the same year. Educational exchanges will take place between primary school, secondary school and collegiate classes and efforts will be made to have as much student involvement as possible to encourage spontaneity. The Quebec Department of Education (QDE) will participate by using its methods and evaluation service to carry out the project's evaluation. In addition, the Quebec Department of Communications will provide technical assistance including technical consultations and installation of antennas located in Quebec. The installation of studios will be easier in that they will be located in the universities, except in Ottawa, where the university will use the CRC facilities.

Conclusion

Since the air time allocated is not in the afternoon or evening, but in the morning, it may not be as easy as expected to fill the allotted periods. Nevertheless, we feel that this experiment will enable us to learn whether this communication mode will be a solution to the problem of Francophone communication or merely a creator of new needs.

2A-1E EVALUATION OF A SATELLITE TVRO TERMINAL FOR USE ON BOARD DRILLSHIPS

submitted by

- Dome Petroleum Limited -

(No presentation)

2A-1E DOME PETROLEUM LIMTED

Project Title: Evaluation of a satellite TVRO terminal for use on board drillships.

Project Sponsor: Dome Petroleum Limited

Project Manager: Cameron J. O'Rourke

Project Co-ordinator: J.B. Mercer
Nam Pui
Chet Perry

Project Objectives:

1) To provide drillship personnel with exposure to equipment and systems using satellite based communications facilities.

2) To provide drillship personnel with exposure to live T.V. broadcasts and as such, reduce the isolation syndrome.

3) To examine the feasibility of receiving signals via satellite using a fixed antenna platform.

4) To assist in determining the actual effects of yaw, pitch and roll on reception in the Beaufort Sea.

OUTLINE OF ACTIVITIES:

- In mid-August of 1980, Dome Petroleum Limited, through its subsidiary Canadian Marine Drilling Limited, installed TVRO equipment loaned by CRC Ottawa on a drillship in the Beaufort Sea. The six foot dish antenna and its low noise amplifier were installed adjacent to the ship's bridge. The ship (Explorer IV) was located approximately 100 nautical miles northwest of Tuktoyaktuk.

- TV signals originating from BCTV and CBC Vancouver were fed via coaxial cable to a TV set located in the ship's conference room. A manual antenna position controller was located near the set.

- Ship's personnel were able to view live program material for a period of $2\frac{1}{2}$ weeks, after which circumstances associated with drilling activities and ice conditions prevented use of the TVRO system.

- Qualitative assessments of picture/sound quality and representative data on ship motions were gathered during the test period.

RESULTS:

- Based upon informal viewers' comments, reception of the two available channels was marginally satisfactory.

- The ship's personnel were generally enthusiastic about the availability of live T.V.

- Alignment of the antenna proved to be difficult on board a moving vessel.

- Some picture degradation was reported during snowstorms and when a low cloud ceiling was present, but the major source of degradation was ship motion. On the basis of recorded roll, pointing errors exceeded the antenna half-power beamwidth approximately six percent of the time during the test period. A further source of motion was due to the shifting and/or consumption of drilling materials which affected the ship's list.

2A-3 EDUCATIONAL DELIVERY OF SERVICES TO FEDERAL INMATES VIA SATELLITES AND TELEVISION

- Stony Mountain Institution -

Presentation by:

R.G. Palmer
Assistant Warden
Stony Mountain Institution

2A-3 STONY MOUNTAIN INSTITUTION

Project Title: "Educational Delivery of Services to Federal Inmates via Satellite and Television"

Project Sponsor: Solicitor General's Department and the Stony Mountain Institution

Project Manager: Richard G. Palmer

My involvement in television as a medium for Education goes back fifteen years. I have taken graduate work in Educational Television at a United States based university as a result of this involvement.

My interest in Educational delivery by satellite and television goes back only five years to a period when I was a resident of North Central British Columbia. The area had limited access to radio and television: we could receive one strong commercial radio station, one weak CBC radio signal and a very weak CBC television signal. Traditionally CBC-TV broke down for ten days during the World Series and for a 36 hour period on the eve of the Grey Cup final.

At this particular time, I was employed as an educational administrator charged with the task of providing services to native students and those students in need of special education services. My territory was large and sparsely populated. There were tremendous costs and problems delivering these services. During my employment I was asked to contribute to a book later published by the University of Indianna on the subject of delivery of Special Educational Services in rural and isolated areas.

By accident my work took me to the Central British Columbia Coastal community of Bella Bella. There, I saw the Satellite Television Medical Support System. At that point I thought that if Medical people could make use of Satellite Television, then so could Education, especially Special Education.

Since that time I have become employed by the federal department of the Solicitor General and am the head of the Education and Training program at Stony Mountain Institution near Winnipeg --- our institution is a large federal medium security penitentiary.

The inmates in federal prisons have limited access to outside television (no cable at Stony and poor reception) and to education programs. This is particularly true of minority groups. By far the largest minority group of Stony Mountain are the native Canadians; they make up 37% of the inmate population. The Corrections Service wants to provide significant credit educational programs to our inmate population.

Satellite delivery would enable us to:

- provide special educational courses and opportunity to the large native population and other minorities within the system (the English Canadian in Quebec)

- provide specialized credit vocational and apprenticeship training from the leading Canadian Educational Institutions

- provide university credit courses from the campus via satellite
These courses could be taught by the best professors in a given field.

- provide specialized academic and literacy courses.

We are committed to the building of our own satellite antenna and to work with the institutions and native groups that will ultimately provide the services. We have assembled a group of staff and inmates knowledgeable in the satellite area and with the abilities to construct our "dish".

My job is to provide good educational services to inmates in the hope that they will develop literacy skills and vocational trade skills so that they can survive in our society and not return to crime. Today, because of present economic conditions we are being asked to provide more services with less funds available. I believe we can do the job with these restraints. In a few words, we could expand our existing educational services and still reduce the over-all cost. The answer is delivery of educational services by satellite and television.

DEPARTMENT OF COMMUNICATIONS
PROJECT OVERVIEW

N.G. Davies
Director
Space Communications
Program Office
Department of Communications

ANIK-B USERS MEETING
DOC PROJECT OVERVIEW

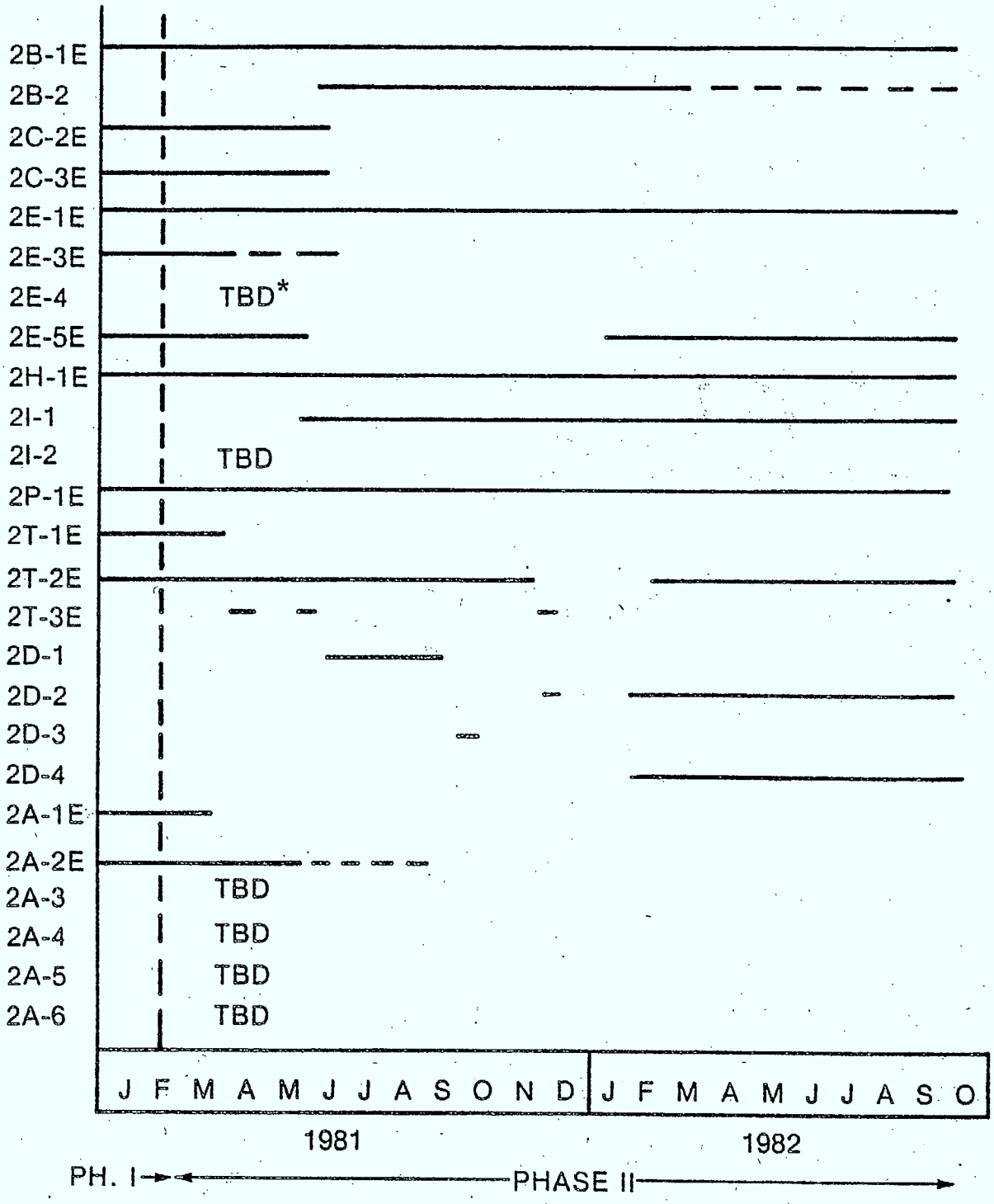
N.G. Davies

The present phase, Phase II, of the ANIK-B program was preceded by the Hermes experiments of 1976-79 and Phase I of the ANIK-B program of 1979-80. The role of DOC has been to prove out the technology for communications using the 14/12 GHz band and to explore the new communications services that could be provided. We recall that the first Hermes experiments provided communications that were unprecedented at that time for the rapidity with which wideband satellite links were established and for the installation of earth terminals on user premises without the complexity of interconnecting terrestrial links. Now, six years later, with the accumulation of experience and the proliferation of 12 GHz (and 4 GHz) TVRO earth terminals, the technology is much more familiar and mundane.

In the ANIK-B program, which presently consists of 15 projects and 14 experiments, demonstrations or aggregated activities (as listed in Table 1), we have sought to prove the viability of the new services over a significant period of time in order to accumulate the background experience and data necessary for decisions to be made regarding operational services. We have not lacked for projects and in almost all cases have had to compromise the objectives of individual projects to accommodate the approved projects. An example of this is the transmission of three western video signals through one TWTA at considerable compromise in technical quality in order to provide a selection of entertainment programming in a trial of TV program delivery and at the same time a test bed for a project in distance education. Equally severe compromises have had to be made in the east to accommodate an interim commercial service, a trial of TV program delivery, a trial of a TDMA business service and a trial of satellite news gathering. Figure 1 shows a schedule of the duration of the operational period for each of the pilot projects. Juggling this schedule to meet the objectives of the pilot projects has been a continuing struggle of the project office.

Towards the end of this phase in September 1982 we will face the test of transition to an operational service in which the users will incur the full cost of transponder lease and have to make long term commitments to a service. In some cases, the service may ultimately be provided at 6/4 GHz (for example for the newly formed Inuit Broadcasting Corporation or for BCTV as part of the CANCOM package) or by terrestrial means (for example, the microwave connection between Toronto and Thunder Bay for the teleconferencing service of the Ontario Ministry of Government Service). During the next months we will be seeking to increase the involvement of the carriers and the regulatory agency in order to increase the understanding of the potential and problems of future operational services. One step has been the transfer of the uplink services in the west for the CBC and BCTV to the Telesat/TCTS ANIK-C terminal in Vancouver. Another is the panel discussion scheduled for later in this meeting. Further steps will be made as we plan for potential Phase III operations after September 1982.

PHASE II
SCHEDULE OF ANIK-B PILOT PROJECT OPERATIONS



*TBD To be determined

Figure 1

TABLE 1

ANIK-B PILOT PROJECTS

TV BROADCASTING/DISTRIBUTION (B)
- 2B-1E Program Delivery - CBC, BCTV, OECA
- 2B-2 CBC - Satellite News Gathering

COMMUNITY COMMUNICATIONS (C)
- 2C-2E Inuit Tapirisat of Canada
- 2C-3E Taqramiut Nipingat Inc.

TELE-EDUCATION (E)
- 2E-1E Knowledge Network of the West
- 2E-3E Ministry of Education of Quebec
- 2E-4 Université du Québec
- 2E-5E Alberta Government

TELE-HEALTH (H)
- 2H-1E Memorial University of Newfoundland

BUSINESS APPLICATIONS (I)
- 2I-1 Canadian Petroleum Association
- 2I-2 Broadcast News

PUBLIC SERVICE (P)
- 2P-1E Ontario Ministry of Government Services

ADVANCED TECHNOLOGY (T)
- 2T-1E Telesat Canada/TCTS
- 2T-2E Department of Communications/CNCP
- 2T-3E University of Toronto

DEMONSTRATION/EXPERIMENTS (D)
- 2D-1 Canadian Amateur Radio Federation
- 2D-2 University of Ottawa
- 2D-3 Australian/DOMSAT - Support
- 2D-4 Association Canadienne d'Education de Langue Francaise
  - Ontario Hydro
  - Newfoundland TV
  - Telesat Radio

AGGREGATED ACTIVITIES (A)
- 2A-1E Dome Petroleum Limited
- 2A-2E Manitoba Telephone System - Project IDA
- 2A-3 Stoney Mountain Institution
- 2A-4 University of Regina
- 2A-5 Alberta Social Services and Community Health
- 2A-6 TCTS Health
  - RCA TV Receive

ANIK-B PHASE III

PANEL: Chairman - R.W. Breithaupt, Director
Communications Satellite Program
Department of Communications

Members - J.D Palmer
ANIK-B Program Manager
Department of Communications

- N.G. Davies, Director
Space Communications Program Office
Department of Communications

Note: The following is the Department of Communications overview of the panel discussion.

PANEL - ANIK-B PHASE III

The Chairman opened by defining the purpose of the Panel to decide preliminary DOC plans for ongoing fixed and broadcast service development beyond September 1982, and to briefly discuss users views of any such Phase III activity. The Chairman then described the general context and concept of a DOC Phase III service development as follows:

- A DOC obligation to support (if possible) experimenters who have made positive viability decisions to continue with commercial service on ANIK-C.

- Most present experimenters will have made viability decisions by September, 1982.

- Any Phase III activity will be related to a need for new service/technology development.

- DOC is preparing a submission for Phase III activity with objectives broadly similar to those of Phase II.

Mr Palmer then provided further detail on Phase III activity. He confirmed that arrangements are being made with Telesat to support those users who have made positive viability decisions regarding commercial operations, until ANIK-C services become available. Thus, the Phase III activity would be divided into three periods (see diagram). During the first two periods, i.e. until ANIK-C2 is operational, ANIK-B video capacity is expected to be largely taken up with the interim commercial services such as SETTE, OECA, KNOW and CBC. A small capacity would still be available for projects with relatively small power/bandwidth requirements.

After ANIK-C becomes operational early in 1983, DOC plans to retain the equivalent of one TWTA for program use for two or three years. This would permit one-way video in both east and west, as well as narrow-band activity across the country. On top of this, a third TWTA would be available from time to time, and possibly also some video capacity during early morning hours. Hence, some two-way video projects may still be possible during the extension period, although the main thrust of Phase III development will be in the narrow-band and medium bandwidth fields, with emphasis on new business application. (Editor's Note: subsequent budget costs will not permit these plans to be put fully into effect).

Mr. Palmer indicated that although Phase III proposals would be solicited from a selected user community, any preliminary proposals or suggestions would be welcome.

Mr. Davies briefly described terminal improvements which he saw as candidates for Phase III activity. These included:

- Very flexible telephony structure with some use of transportable terminals to meet requirements of small groups of subscribers.

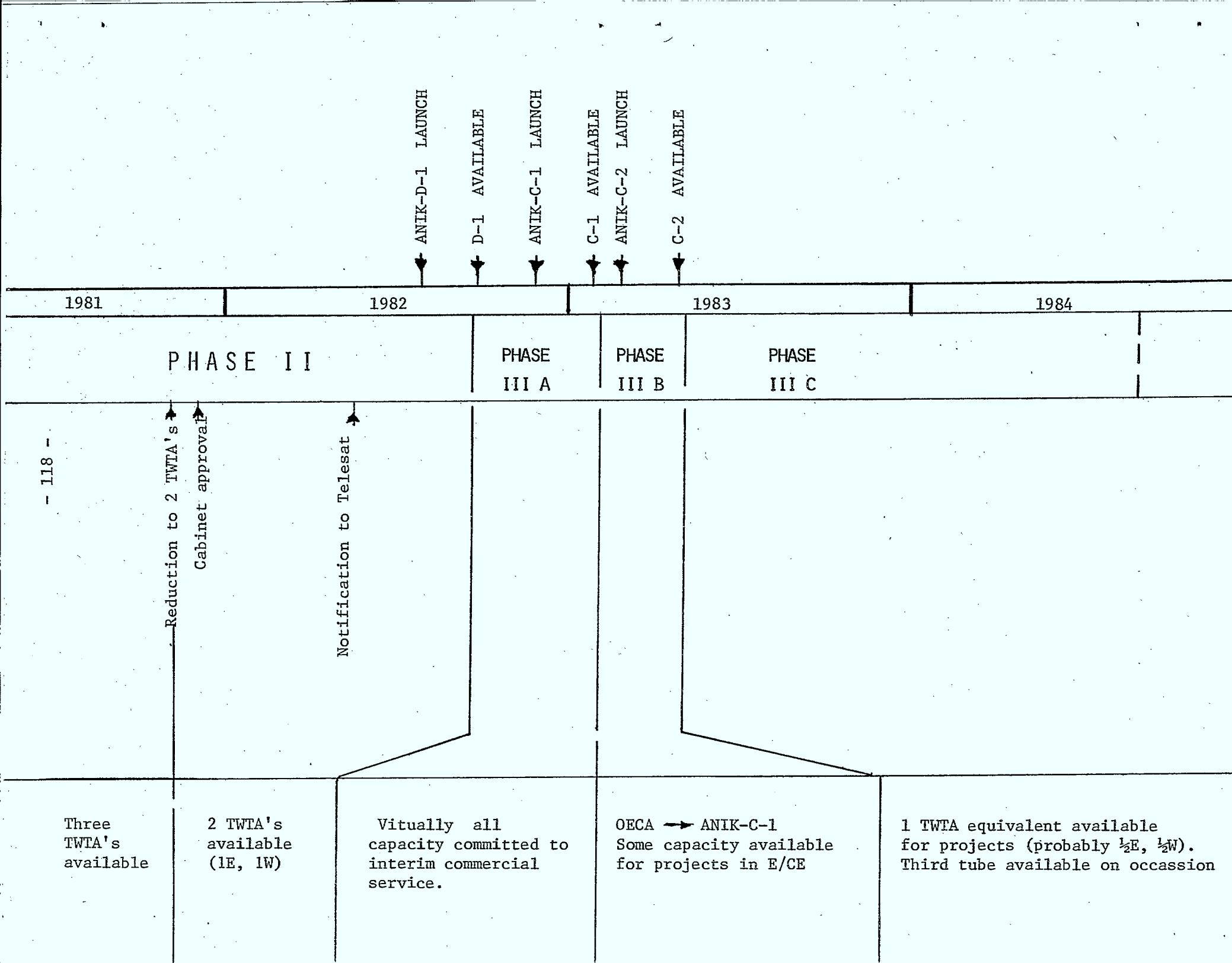
- Investigation of very flexible data services

- Investigation of requirements and capabilities for receive only operation for radio program or data applications

- Teleconferencing with highly transportable terminal, perhaps "push-to-see" reduced band-width transmission

- Terminal development to meet specialized needs of resource industries.

Following this, questions or comments were invited from the floor. Allen Yen of the University of Toronto expressed interest in satellite transfer oscillation characteristics for precise phase measurements. Bruce Robertson of OMGS asked what development priorities had been established; the Panel responded that this had not been agreed as yet. Mr. Davies was asked by Alex MacGregor what new terminals would be available in future and when; and he responded by noting the present telephony terminal development, improved TV receive terminal work, a news gathering terminal for the CBC, and the start of stabilized platform studies. Alan Miller of Miller Communications Systems commented that DOC should analyze requirements systematically, and then call for proposals from industry, and selected government and other users. The Chairman indicated that a limited call for proposals would be made, according to the schedule indicated by Mr. Palmer, after Phase III activity was approved.


ANIK-D-1 LAUNCH
D-1 AVAILABLE
ANIK-C-1 LAUNCH
C-1 AVAILABLE
ANIK-C-2 LAUNCH
C-2 AVAILABLE
1981
1982
1983
1984
PHASE II
PHASE III A
PHASE III B
PHASE III C
Reduction to 2 TWTA's
Cabinet approval
Notification to Telesat
Three TWTA's available
2 TWTA's available (1E, 1W)
Vitually all capacity committed to interim commercial service.
OECA → ANIK-C-1
Some capacity available for projects in E/CE
1 TWTA equivalent available for projects (probably ½E, ½W).
Third tube available on occassion

TRANSFER OF USERS TO COMMERCIAL SERVICE

PANEL: Chairman - B.C. Blevis
Director General
Space Program and Applications
Department of Communications

Members - R. Zeitoun
Manager, Policy and Planning
Technical Planning and Analysis Branch
Canadian Radio-Television and
Telecommunications Commission

C. Webster
Vice-President, Engineering
CNCP Telecommunications

B. Bonneau
Manager, Carrier Relations Division
Business Development Department
Telesat Canada

R. Montgomery
Director, Satellite Services Development
Trans Canada Telephone System

D. Rainboth
Director, Extension of Services Policy
Broadcasting and Social Policy Branch
Department of Communiations

Note: The following is the Department of Communications overview of the panel's discussion.

TRANSFER OF USERS TO COMMERCIAL SERVICE

The Chairman opened by introducing the Panel Members and expressing pleasure that virtually all major parties concerned with the introduction of commercial fixed and broadcast satellite services were present on the Panel. He noted that the purpose of the Panel was generally to discuss the transfer of successful pilot project activities to commercial services at 14/12 GHz on ANIK-B or C; and that the transfer question could be considered in terms of what will be transferred, when will it be transferred, and how will this be accomplished (including which carriers would be involved). Prior to any general discussion, the Chairman invited Panel Members in turn to make introductory comments on this transfer process, from their individual perspectives.

Ben Bonneau opened by noting the scheduled availability of planned Telesat satellites. These were given as:

ANIK-C1**	launch Sept. 82*, operational Dec.82
ANIK-C2	launch April 83, operational June 83
ANIK-C3**	launch late 84, operational 2 months later
ANIK-D1	launch early August 1982 operational Oct. 1/82

Bob Montgomery of TCTS indicated that the carriers needed to develop new facilities in order to meet new service requirements, and that needs and opportunities for new services were only now being assessed. He added that, as satellite system costs are high, wisdom would be required to decide when the transition to satellite service should take place.

Charlie Webster of CNCP indicated that CNCP now recognized a need to provide satellite communications services, and that CNCP wishes to push forward with development of a TDMA system and services.

Ralph Zeitoun confirmed the CRTC's continuing interest in ANIK-B project activity, as well as his concern that some false service expectations would result from these projects. An emphasis on rational development of new services is needed, which will complement existing offerings.

Editor's Note:
* Most recently announced date is 11 November 1982, operational 60 days later.
**C1 & C3 designators have since been interchanged.

Dan Rainboth, representing the policy area of DOC, reported a number of encouraging decisions regarding the transition of pilot projects to commercial service. He cited the TV Ontario decision to use ANIK-C, the newly created Inuit Broadcasting Corporation, the licensing of Atlantic TV2, the growth of KNOW and ACCESS and their expected use of ANIK-C, the work of the Federal/Provincial Task Force on Satellites and Education, and the gradual liberalization of earth station ownership and licensing.

In the ensuing general discussion, the following questions from the floor were raised:

Q. Peter Bowers - How can we intelligently plan to use ANIK-C without knowing the tariff or who will sell the service? What changes may come about in ownership of receive and transmit terminals?

A. Dan Rainboth - referred to a Sept. 12 Globe and Mail article which reported various government recommendations on earth station ownership, including that considerable liberalization was expected for receive-only terminals. No changes are seen in the near future for ownership of uplinks.

A. Ben Bonneau - explained that rates for 14/12 GHz service were in the final stages of assembly by Telesat, and that these were generally expected to be, for a full 54 MHz transponder channel and subject to CRTC approval:

class 3 (unprotected and preemptible) $1.8M/yr.
class 2 (unprotected and non-preemptible) $2.3M/yr.
class 1 (protected and non-preemptible) $3.0M/yr.

Bob Montgomery and Charlie Webster said that TCTS and CNCP respectively would quote uplink and space segment costs based on these Telesat numbers.

Q. Peter Bowers - Given that a short-term lack of satellite capacity will exist at 14/12 GHz in the US, and given that Canada (Telesat) may well sell ANIK-C capacity to the US during this shortfall, will rates to Canadian users be impacted, and will Canadian or US users receive priority?

A. Ben Bonneau- Since rates are based on best guess of utilization, sales to the U.S. will have an impact. Telesat's first commitment is to Canadian customers. Service to U.S. customers is provided on the basis that it is pre-emptible if required for Canadian uses.

Q. C. Webster - Would a customer be adequately served by leasing unprotected services?

A. P. Wadham - The greatest risk is with the launch itself. Given a successful launch, reliable service will be provided.

Q. G. Cormack - Given lease price of $1.1M/yr. for a 6/4 GHz TV channel, and $.9M/yr. for a 14/12 GHz TV channel, why are costs higher for 6/4 GHz, and for occasional use?

A. R. Zeitoun - 6/4 GHz service provides all-Canada coverage, while ANIK-C provides half-Canada coverage.

A. R. Montgomery- Rates vary depending on the time of day and the number of hours used.

Q. Wayne Taylor- Is there a bandwidth shortage projected in 5 years for the 14/12 and 6/4 GHz frequency bands? What will be the channel availability?

A. Ben Bonneau - Telesat Canada has responsibility towards customers and has confidence that the supply will be adequate.

Q. Peter Bowers- What Canadian organization could amortize a $800M high power DBS satellite over its operating life? Why not push high capacity terrestrial cable distribution systems, using a hybrid solution which also involves <u>low</u> power DBS satellites?

A. Bert Blevis - Agreed that such a hybrid approach would be most practicable.

ANIK-B USERS MEETING ATTENDEES AND DISTRIBUTION LIST

* Attendees at the ANIK-B Users Meeting

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ANIK-B USERS MEETING.
--Summary record of the ANIK-B users...