Report of the Working Group
on
Direct-to-Home Satellite
Broadcasting for Canada

Department of Communications

June 1984

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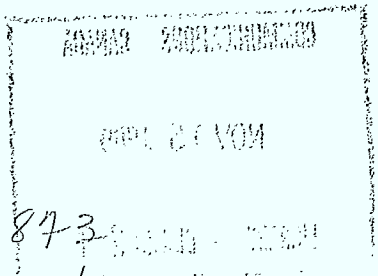

Table of Contents

EXECUTIVE SUMMARY

OBJECTIVE:

This paper analyzes the potential for development of direct-to-home satellite broadcasting services in the context of the government's broadcasting strategy, with particular regard to the equalization of services thrust in that strategy. It draws heavily on information provided in submissions received in response to a call for public comment on direct-to-home satellite broadcasting in the Canada Gazette, as well as further details provided by departmental officials who reviewed the submissions. The particular focus is delivery of direct-to-home satellite services prior to 1990, with some discussion related to longer-term DBS planning.

CONSIDERATIONS

Various concerns, not all of which are complementary, are brought into play in the discussion of direct-to-home delivery prior to 1990. They can be summarized as follows:

1. Broadcasters - Broadcasters generally expressed the view that cost-efficiency of delivering programming is of paramount importance, and technology should not be permitted to take precedence over program production. Neither should direct-to-home delivery be allowed to upset basic distribution and networking requirements. Costs, signal quality and coverage areas are matters of prime concern in terms of satellite delivery.

2. Carriers - Telesat is particularly concerned to ensure the lease of as much of its available capacity (primarily on the Anik C series) as possible, at rates which enable it to recover the cost of the 14/12 GHz portion of its space segment, and provide for a reasonable rate of return. It should be noted that one major reason for the existing excess capacity is that the original 1976 projections by Telecom Canada for use of fully-protected RF channel services on the Anik C series had been substantially reduced and changed to unprotected, non-preemptible RF channel services by 1984. Telesat has proposed participating financially in a direct-to-home broadcasting service itself.

3. Consumers - Consumers are primarily attracted to any broadcasting service, including a direct-to-home satellite service, by the programming available. The programming currently available on Anik C is limited to pay-TV and some educational and regional broadcasters. Other factors which influence consumer acceptance of this type of service include the cost of the earth station and its size, and protection from interference. Although the 14/12 GHz satellites satisfy these requirements better than do the 6/4 GHz satellites, the critical element of programming is missing.

4. Market - The underserved market which could be served by direct-to-home satellite broadcasting is about 1.5 million households. It is geographically dispersed and remote in parts, making it particularly difficult to access in terms of sales and service. For these reasons, penetration of the market is likely to be slow. The small size of the market also brings into question whether services which have the potential to compete with each other should be encouraged.

5. U.S. developments - Plans in the U.S. for DBS services could add another twenty to forty programming services to the U.S. roster. Regulatory and policy issues relative to the sale of U.S.-based subscription DBS services to Canadian homes have not yet been addressed, and will require bilateral discussions with the U.S. DBS developments in the U.S. are not, however, a new threat to the Canadian broadcasting system and to cultural sovereignty, but rather a volume addition to the existing threat posed by the extensive availability of American programming. (Direct-to-home satellite programming will, however, be available over a much wider geographical area.)

6. Regulatory and policy concerns - Regulatory and policy concerns center around the objective of extension of services, and the financial viability of entities which have been or may be licenced for this purpose. In addition, there is a need for clarification of the CRTC's regulatory stance on who may provide direct-to-home satellite broadcasting services, and under what regulatory and licensing requirements.

7. Federal-Provincial - The Provinces of Newfoundland, Nova Scotia and Ontario submitted opinions in response to the Gazette Notice. These opinions were, on the whole, supportive of the use of direct-to-home satellite technology. With regard to educational broadcasting, ACCESS (Alberta Educational Communications Corporation) expressed no preference for a particular technology.

DELIVERY ALTERNATIVES:

Further extension of broadcasting services could be achieved through the use of either existing 6/4 GHz satellites or existing 14/12 GHz satellites, or through combined use of both satellites.

The Anik C (14/12 GHz) satellites have better technical potential for delivery of broadcasting direct-to-home than do the 6/4 GHz satellites (Anik B and D), particularly in southern Canada, and operate in a frequency band where DBS has been accommodated through international agreements. The smaller, less costly earth stations required would undoubtedly promote faster market penetration of direct-to-home services. However, it must be recognized that certain limitations and disincentives exist to development of national broadcasting services on these satellites.

The first is a technical limitation: Anik C does not currently have good coverage north of 60° (although coverage can be improved through a slight tilt of the satellite, which should be undertaken prior to delivery of any direct-to-home broadcasting package). Although the majority of the geographically dispersed population does not live in the North, this poor coverage factor nonetheless would make it difficult to consolidate on the Anik C satellites a service which could simultaneously serve the direct-to-home market and the remote community market. The development of two competing services threatens fragmentation of a limited market and could seriously impair the financial viability of both services. One alternate solution is for a single service provider to operate a service utilizing both bands - 6/4 GHz to reach the community market and 14/12 GHz to reach the direct-to-home market.

A further limitation on developing direct-to-home broadcasting on Anik C is the fact that few programming services currently exist on the 14/12 GHz satellites, and the cost for delivering services on a national basis using this satellite is considerably greater than for delivery using 6/4 GHz satellites. Broadcasters would be able to access more of the underserved direct-to-home market using Anik C, because the smaller antennas required are less costly. However, this market is sufficiently small, dispersed, geographically remote and difficult to service to raise concerns about the potential financial return.

Both the 6/4 GHz satellites and the 14/12 GHz satellites have advantages in terms of addressing different segments of the underserved market. The decision on how to utilize the technology most efficiently to deliver an adequate selection of programming to all parts of the market should be left to a consortium of commercial interests.

GOVERNMENT ROLE

The government's broadcasting strategy, announced in March, 1983, contained an equalization of services thrust designed to reinforce the national effort to equalize the level of broadcasting services throughout the country by employing all available distribution technologies. In view of the fact that there are in Canada approximately 1.5 million households which are too dispersed to be served effectively by cable or rebroadcast operations, the delivery of broadcast programming direct to home by satellite becomes an important vehicle to achieve this policy objective.

As a first step to reviewing this issue, the Department of Communications undertook over a two year period a major studies program, culminating in the release last June of the information paper Direct-to-Home Satellite Broadcasting for Canada. The call for public comment on that paper was a second step, leading to further analysis of the issue. The conclusion of that analysis is that the government should encourage development of a direct-to-home broadcasting service on existing satellite facilities, and undertake a liaison role between Telesat and broadcasters in considering the question of an effective direct-to-home broadcasting capability in the design for the next generation of communications satellites, to be launched between 1990 and 1992.

With regard to a direct-to-home broadcasting service prior to 1990, it is felt that the Anik C series of 14/12 GHz satellites would be the better alternative for delivery (assumming a slight tilt of the satellite to improve coverage in the North). Further extension of services using 6/4 GHz satellites is possible through further development of small community broadcasting undertakings. In addition, CANCOM is planning, through a dealership network, to market actively a 6/4 GHz "DBS Service", using relatively inexpensive personal decoders. Although this type of extension of services promotes easier access, especially by community broadcast receiving operations, to existing programming packages on these satellites, it does not provide the individual consumer with a truly low-cost, aesthetically pleasing, or potentially interference-free installation.

The government role in promoting development of a direct-to-home broadcasting should be generally in line with the institutional model number two outlined in Chapter 10 of Direct-to-Home Satellite Broadcasting for Canada. The government should seek to foster the introduction of a direct-to-home broadcasting service by co-ordinating planning activities among interested parties, as opposed to playing a role financially in the establishment or maintenance of such a service.

This co-ordination role should be undertaken within certain broad policy parameters, in line with the broadcasting strategy objectives. The role of direct-to-home broadcasting services should be defined as complementary to existing broadcasting delivery systems, and in particular, as an effective vehicle for delivering broadcast programming to households which are currently underserved. The focus of direct-to-home satellite broadcasting should be to deliver existing broadcast programming to this market, as opposed to generating new programming. Furthermore, since the underserved market is somewhat limited and difficult to access, a single service aimed at remote communities, dispersed households, and the extra cable market seems most likely to succeed.

RECOMMENDATIONS

In order to advance this issue, the following actions could be undertaken at this point:

- The Minister of Communications could write to the Chairman of the CRTC, outlining the results of this analysis, and suggesting that the Commission take whatever regulatory action might be appropriate to promote the development of direct-to-home satellite broadcasting.

- The Minister could approach Cabinet for the Order-in-Council authority required to allow Telesat to participate in a direct-to-home broadcasting venture using existing satellite facilities, once the required subsidiary company has been incorporated by Telesat.

- In consultation with the Department, the CBC could be asked to assess options for its role in direct to home broadcasting services, consistent with the statement in the CBC strategy that "the government has endorsed fulfillment of the intent of the Accelerated Coverage Plan, while giving greater consideration to more cost-effective alternatives, such as the use of new satellite technologies".

- Further consideration could be given to a structure whereby the Department can become involved in conjunction with Telesat Canada, the terrestrial common carriers, and broadcasters, in a planning exercise for the next generation of satellites. This planning should take into account the needs of the broadcasting system in terms of cost, coverage and distribution, and allow for the integration of a direct-to-home delivery capacity on the satellites.

In the analysis of this issue, the possibility of providing government subsidies designed to equalize rates between the two series of satellites, in order to promote services using Anik C, was considered. However, it was decided that this would have the effect of creating something of an artificial environment with regard to cost of satellite delivery of broadcast programming.

Furthermore, the effect of such a program on the broadcasting system is unpredictable: which services would be likely to take advantage of the opportunity, and how would it affect their business operations and those of their competitors? Is it realistic to suppose that such a subsidy program could be discontinued after several years? Should resources be directed at this activity as opposed to further support of program production? And finally, how would such a program be administered? For these reasons, a subsidy program is not considered to be an appropriate response to this issue at this time.

I. Introduction

This paper analyzes the potential for development of direct-to-home satellite broadcasting services in the context of the government's broadcasting strategy, with particular regard to the equalization of services thrust in that strategy. This focus is taken at the direction of senior management of the Department of Communications, as a continuation of the work of implementing the broadcasting strategy. In the notice published in the Canada Gazette of October 15, 1983, it was emphasized that the call for public comment on the issues surrounding the introduction of direct delivery of satellite broadcasting services was intended to give effect to the equalization of services thrust in the strategy, "designed to reinforce the national effort to equalize the level of broadcasting services throughout the country by employing all available distribution technologies".

The paper therefore considers the question of direct satellite broadcasting within the overall context of broadcasting policy, and in relation to the institutional, economic, social and cultural factors which govern the development of the existing broadcasting system in Canada. It draws heavily on information provided in the submissions received in response to the Gazette notice, as well as further details provided to departmental officials who reviewed the submissions. In addition, members of the departmental working group called together to analyse the submissions added further information and valuable perspectives to the exercise.

II. Definitions

The ITU definition of a Broadcasting-Satellite Service is "a radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public". In this definition, the term "direct reception" includes both individual reception (... "by simple domestic installations and in particular those possessing small antennae") and community reception (encompassing more complex receiving equipment and larger antennas, used by a group at one location or through a distribution system covering a limited area).

Within the parameters of this general definition, the terms used in this paper are explained as follows:

DBS or direct broadcasting satellite service: a service operating in the broadcasting satellite service band (12.2 - 12.7 GHz), in accordance with the plan for the provision of broadcasting satellite services established by the 1983 Regional Administrative Radio Conference. Services would be provided by satellites which conform to the specifications of the plan, and the spacing of orbital positions for these satellites would be 9°. This affords effective protection from interference for individual users of such a service and allows for the use of small receive antennas (1 metre or less in diameter). Such a service may operate on a high power basis (EIRP's of from 54-57 dbw at edge of coverage), or possibly on a medium power basis (EIRP's of from 50-54 dbw at edge of coverage).

14/12 GHz direct-to-home satellite broadcasting service: a broadcasting service allowing for reception of lower-power satellite signals (EIRP's of from 42-50 dbw at edge of coverage) by individuals using medium-sized antennas (1.2 metre or 1.8 metre), and operating in the 11.7-12.2 GHz band. Use of this band for broadcasting satellite services is permitted by a footnote in the ITU radio regulations, provided that these transmissions are below a 53 dbw power level. This band does not

currently experience significant interference problems but in the future (post-1990) pressure for higher capacity in the orbit may result in closer satellite spacing and a requirement for larger antennas to access such a service.

6/4 GHz direct-to-home satellite broadcasting service: the reception by individuals using antennas of 3.0 metres or larger diameter of program signals, primarily intended for distribution purposes, transmitted by satellites operating in the 6/4 GHz bands. The 4 GHz band is allocated internationally to fixed (terrestrial) and fixed-satellite services; these are point-to-point and point-to-multi-point services. Therefore, no protection is provided for public reception of these signals on a broadcasting basis. Interference problems in this band can be significant (e.g. interference from terrestrial microwave transmissions in urban and some rural areas; interference from adjacent satellites), and are likely to increase even in uncongested areas as the planned spacing of satellites is reduced from 5° to 3.5° to 2° (for U.S. satellites). The consequence for the individual consumer is a need for a larger antenna to access these services, and greater difficulty in siting the antenna.

III. Direct-to-Home Satellite Broadcasting Services in the 1980's

Discussion of the potential for development of direct-to-home satellite broadcasting services in Canada prior to 1990 must focus on a variety of issues. They include the broadcasters' perspective, carrier issues, consumer concerns, market considerations, the impact of international developments, (in particular, the development of direct-to-home services in the United States), and regulatory matters.

A. The Broadcaster Perspective

In analyzing the approach of broadcasters to the issue of direct-to-home delivery via satellite in the 1980's it is imperative to recognize that, for current broadcaster satellite users, direct-to-home delivery must take

second place to basic distribution needs. Broadcasters who currently use satellites do so in order to satisfy needs for networking and distribution of signals to cable and rebroadcast head-ends. One of their most important concerns is that these requirements not be disturbed in the process of attempting to satisfy extension of service needs through direct-to-home delivery.

This concern comes through clearly, for example, in the CBC submission. That submission points out that the Anik D series of satellites best meets the Corporation's basic distribution needs, because, in the CBC's opinion, the performance and characteristics of the 6/4 GHz satellites lend themselves ideally to the geography and population distribution of Canada and are most appropriate for national network and northern and remote services. Although 14/12 GHz satellites could be utilized to meet the Corporation's regional distribution needs in some parts of the country, this would be at some extra cost. The CBC is interested in possible applications of 14/12 GHz technology for coverage extension through direct-to-home delivery, but points out that further advances in coverage extension could still be made through use of the 6/4 GHz facilities (e.g., by purchasing reception facilities for small communities).

TV Ontario, on the other hand, believes that direct-to-home services should be encouraged on 14/12 GHz satellites by making more programming available on Anik C and subsidizing the cost of home receivers. As TVO currently uses a half-transponder of Anik C for distribution purposes in the eastern part of Canada, its own networking and distribution arrangements would not be disturbed by this proposal. This is also in line with the position of the province of Ontario, which feels that Anik C is the most viable means of introducing direct-to-home services in Canada, and that the federal government should move quickly to encourage the introduction of such a service.

CANCOM finds itself in a difficult position with regard to the possible use of Anik C to deliver direct-to-home broadcasting services. While switching its signals from Anik D to Anik C should allow the company to access more of the underserved market on a direct-to-home basis, it would also require the purchase of new reception equipment by most of its existing affiliates. As of March, 1984, one hundred and seventy-six CANCOM affiliates were operational, and more had already ordered 6/4 GHz reception equipment. The company understands that few of these affiliates currently have 14/12 GHz reception facilities. The current cost of procuring professional quality equipment is $4,000 to $15,000, depending on its complexity, to which fairly high shipping costs must often be added. This can be a significant cost factor for cable or rebroadcast operators in very small communities. Furthermore, CANCOM affiliates north of 60° latitude would suffer if the company were to switch its signals to Anik C, as the coverage of this satellite in the North is not good. Larger reception facilities (up to 4.5 metre dishes north of 70°) would be required, and their procurement would be a hardship for these affiliates. Finally, CANCOM has recently announced plans to market a personal decoder which will allow individual customers to access its signals on Anik D at a more reasonable cost ($495 for the descrambler, plus the cost of the TVRO). For all these reasons, a switch from Anik D to Anik C at this point would constitute a disturbance to CANCOM's existing distribution system.

Underlying the broadcasters' concern that basic distribution requirements take precedence over direct-to-home delivery is the belief that direct-to-home broadcasting should not compete directly with more conventional (terrestrial) delivery systems. In fact all submissions, with the exception of the one from the Government of Ontario, placed direct-to-home broadcasting in the near term solely in the context of equalization of viewing opportunities in underserved areas.

A second issue which is of great importance to broadcasters is the differential in costs involved in utilizing Anik C as opposed to Anik D.

At the time when the submissions were prepared, the cost differential calculated by broadcasters was based on an annual rate of $1.3 million per transponder for national coverage on Anik D (unprotected, non-pre-emptible) versus $1.8 million for half-transponder coverage on two half-Canada beams on Anik C, at the same medium grade of service. Since that time, a decision by the CRTC on Anik C rates has increased the differential: full-Canada coverage on a half-transponder of Anik C at a medium grade of service is now just over $2 million per year. The same coverage in a full-transponder mode would cost more than $4 million.

In its decision, the Commission expressed the view that the cost of half-Canada coverage on Anik C should appropriately be in the range of 60% to 68% of the cost of full-Canada coverage on Anik D (the current ratio is 72%). If this relationship is achieved by raising Anik D rates slightly, broadcast users would still be faced with rates 20% to 36% higher to achieve full-Canada coverage on Anik C as compared to Anik D, in the half-transponder mode. Even allowing for the fact that Anik C provides better time-zone flexibility and good service for broadcasters with regional mandates, this rate differential, combined with the poorer coverage by Anik C in the North, constitutes a powerful disincentive for broadcasters requiring national distribution to use the 14/12 GHz satellites.

In emphasizing the importance of cost in determining appropriate distribution arrangements, broadcasters generally expressed the opinion that, to the greatest extent possible, financial resources should be directed to the production of quality programming rather than to distribution needs. This position was stated most succinctly by the CBC:

> "The government's and CBC's broadcasting strategies are dominated by the imperative to increase the amount and quality of Canadian programming available and viewed by Canadians. Though important for its distribution objectives, the Corporation believes technology must not be allowed to lead content, nor must its development dilute resources for programming."

Copyright issues inherent in delivery of programming direct-to-home by satellite will obviously be of concern to broadcasters. The Working Group noted that the recently published (May 1984) Guide to Canada's Copyright Revision Proposals states that the concept of "transmission" will be developed and clarified to include any originating activity such as satellite developed since the advent of commercial public broadcasting. The Guide adds that all originating transmissions to the public will require the consent of the owner of the copyright in the works being used (the so called "underlying works"). The Working Group noted the importance of this issue, but considered that it is too early to judge the economic impact which might eventually result from statutory changes in this regard.

B. Carrier Issues

The carrier concerns referred to in relation to this issue are particularly Telesat's, though they extend to the terrestrial common carriers through the connecting agreement with Telesat. Telesat's basic concern in this matter is to ensure the lease of as much of its available capacity on the Anik C series as possible, at rates which enable it to recover the cost of the 14/12 GHz portion of its space segment, and provide for a reasonable rate of return.

In its recent decision on Anik C rates*, the CRTC partially rejected the argument made by some intervenors, including broadcasting interests, that Telesat should set rates for its entire space segment (6/4 GHz and 14/12 GHz) based on factors such as value of service and rate relationships. The Commission concluded that each space service should be separately costed, but that factors such as those referred to above should be taken into account.

During the hearing, criticism was directed at Telesat's use of utilization forecasts in its rate-setting process, which resulted in such anomalies as Telecom Canada's original (1976) forecast of requirements for fully protected, RF channels on the Anik C series being substantially reduced and changed to unprotected, preemptible RF channels by the 1984 forecast, with higher rates proposed by Telesat as a consequence. Telesat's representative stated that, in the Company's view, there were no reasonable limits that might be placed on the amount of excess capacity for which customers could be expected to pay through rates, and that attempting to set some minimum capacity which would be the responsibility of Telecom Canada to fill would threaten termination of the connecting agreement and create grave uncertainty as to Telesat's financial future. However, other intervenors, such as Northstar, argued that because the failure by Telecom Canada members to utilize the Anik C series of satellites to the degree forecast for telephone message traffic was one cause of the overall underutilization, it would be wrong to ascribe any portion of the cost of the underutilized capacity to video users, whose use has exceeded original forecasts.

* Telecom Decision CRTC 84-9

The Commission expressed the view that Telesat should develop a form of percentage fill objective applicable to future generations of satellites, and that spare capacity be limited and fixed for the eight year test period used for this rate-setting purpose, to ensure that customers are not required to pay for unreasonably high levels of spare capacity caused by fluctuations in utilization forecasts. The Commission noted that the company's current utilization forecast would provide for a 2/3 fill factor for the Anik C series, provided that Anik C-1 was put into a storage orbit when launched and not used before mid-1987. It recommended that this in fact be done.

In view of the Commission's decision on Anik C rates, the cost differential between Anik D and Anik C in terms of providing a national service will continue to be a disincentive to broadcasters to utilize Anik C. Telesat's reply to this problem is that, since the rates provide for a return of 14%, they would decrease if enough transponders were sold. As the common carriers have now established their projected needs at a lower rate than originally anticipated, this extra traffic would presumably have to be provided by broadcasters.

Information provided by Telesat indicates that, for every empty transponder filled in January, 1985, the rate could drop by about 2.6% over and above its September 1983 forecasted utilization. For example, if one full transponder were leased, Telesat might see fit to drop the rate from $4,064,496 to $3,958,819 (for full-Canada coverage, unprotected, non-pre-emptible). If eight full transponders were leased, the rate might drop to $3,219,080. It is probable, however, that the full potential decrease in rates might not be realized. Lease of Telesat's total projected available Anik C capacity in 1985 (about 10 full transponders) would, the Company predicts, result in a rate reduction of between 25% and 35%. One further pertinent factor is that the longer the time before the transponders fill up, the lesser the decrease in rates. For instance, the 2.6% decrease per transponder lease quoted for January, 1985, would have been 4% in January, 1983.

Although the potential of a rate decrease may make the Anik C service more attractive to broadcasters, it should be noted that this issue was not addressed in the CRTC Anik C rate decision, nor does it play a role in Telesat's model and business proposal for Company X. It is not an element which Telesat itself has brought to the fore in its arguments for increased utilization of Anik C capacity.

C. Consumer Concerns

The concerns likely to be brought to bear by the consumer in making a decision whether or not to purchase a direct-to-home satellite broadcasting service can be summarized as follows:

- What programming is available and at what fee?
- What is the cost of the installation?
- What is the size and complexity of the installation?
- Is the service likely to be available without interference for a reasonable length of time?

Leaving aside for a moment the question of programming, the other three consumer criteria are best satisfied by a true DBS operation, reasonably well satisfied by a 14/12 GHz direct-to-home operation, and not so well satisfied by a 6/4 GHz operation. The emergence of de facto DBS with individually owned dishes aimed at 6/4 GHz satellites is attributable to the existence of program signals intended for distribution purposes on these satellites, and in the main, on the existence of popular American services in this band (presently available in unscrambled form). The proliferation of individual use of these fairly costly installations does, however, underline the significance of availability of attractive programming as a vital factor in any sort of direct-to-home delivery service.

The fourth factor which should be of significance to the consumer is protection from interference. It should be remembered that full protection is offered the consumer by the planned 9° satellite spacing of true DBS services, that reasonable protection exists for the near term in the 14/12 GHz band, and that no protection is afforded to broadcast services in the 6/4 GHz band, where the individual consumer's interests are already being threatened by a decrease in satellite spacing. Although this factor is of less immediate concern than programming availability and cost to the consumer, it does have the potential to affect the equation by requiring larger earth stations for reception and thereby driving up the cost of the installations.

D. Market Considerations

The underserved television market is generally estimated at 1.5 million households in Canada which are too remote and/or geographically dispersed to be effectively served by cable or low power rebroadcast systems. This estimate generally excludes most of what is considered the CANCOM community market: communities of more than 300 households or 1,000 individuals.

Two recent market surveys add to our understanding of what would be the likely penetration rate of this market by television services delivered direct-to-home by satellite. The first of these assessed demand for a proposed satellite service offering Canadian pay-TV channels at $16.50 per month, and some services now available free of charge on Anik C3 (TVO, ASN, Knowledge Network), with the purchase of a 1.8 meter earth station, including descrambler. The survey sample consisted of over 1,000 households not served by cable. One year and five year penetration levels were estimated on the basis of consumer responses, to which a diffusion model was applied. The survey projected sales of 14,000 units within the first year. Cost of the reception equipment did not appear to be of primary concern to first-year purchasers. Similarly, purchase intentions

did not differ substantially between "buy" and "lease" options. After five years of operation, the survey predicted about 10% penetration of the market assuming a cost of $1,500 per installation.

The second survey attempted to assess demand for a service providing a greater choice of programming, with one of the options involving a lesser cost for reception equipment. The survey sample was 600 households, none of which were served by cable.

The major finding of the survey was that 55% of the sample indicated some level of interest in purchasing or leasing receiving equipment, assuming an acceptable price level and program package. (This includes levels of expressed interest ranging from "very interested" to "somewhat interested" to "not very interested".) Added to this result was consideration of TVRO size and cost, as well as coverage and reception factors, to determine penetration rates for broadcasting services delivered in the 14/12z GHz band. According to the resulting projections, at the end of year one of operation, a half-transponder service offering eleven of a possible sixteen channels would achieve just over 100,000 subscribers (about a 7% penetration rate). A full-transponder service offering eight channels would achieve about 150,000 subscribers (9%). At the end of five years, the penetration levels would be about 460,000 (27%) and 600,000 (35%) respectively.

E. The Telesat Proposal

Telesat Canada proposed in its submission to the Department of Communications the formation of a "Company X" to package and provide direct-to-home services on two of the Anik C satellites, using a full-transponder mode of operation. Telesat projects that such a company

would require $45 million in initial capitalization, including transponder costs (before they are offset by revenue), uplink costs, and costs of encoding/decoding equipment, and could look forward to a pay-back period of 3.7 years. Telesat also proposes that it could itself participate in the capitalization of such a venture. (This would require an Order-in-Council authority under section 6 of Telesat Act, to permit Telesat to participate in a direct-to-home operation.)

By comparison, it is interesting to note that the original financial projections for CANCOM predicted a deficit for the first three years of the operation, and a profit in the fourth, based only on sales of the four Canadian television signals in the" core" market. In fact, the company's experience has been that the underserved market is difficult to access, and after three years of operation, CANCOM has fallen significantly behind its original financial projections. Although some of CANCOM's problems were precipitated by delays in licensing affiliates by the CRTC, and delays by affiliates in becoming operational (neither of which would be a factor in direct-to-home delivery), the company's experience does give an indication of the problems inherent in reaching the underserved market. This market is difficult to access and costly to serve and rate of penetration of equipment as well as ability to service customers will be vital factors in the success of any direct-to-home venture.

A pertinent issue raised by the Telesat submission is the role CANCOM should play in delivery of direct-to-home services. The submission states that CANCOM should remain on Anik D in order to service cable and rebroadcast affiliates and provide adequate service to the North, and other service providers should package programming for Anik C. (This would, of course, result in the greatest possible amount of traffic on both D and C.) In support of this position, Telesat pointed out that there would still be a place for CANCOM in direct-to-home delivery via 6/4 GHz. Its market analysis indicates that in competition with a half-transponder Anik C service, direct-to-home delivery via Anik D could expect to capture 30% of the market, and in competition with a full-transponder mode would capture a 25% market share.

However, the question of whether any form of competition should be encouraged in the underserved market must be examined closely. To begin with, the part of the underserved market which can be accessed only on a direct-to-home basis has valuable revenue-producing potential, which could either strengthen CANCOM's financial position or go to another service provider. Secondly, if direct-to-home services are developed on Anik C for delivery to underserved areas on a subscription basis, this will be the first DBS-type service offered in Canada. The broadcasting and cable industry have already made known their view that these services should not compete with terrestrially-delivered services. The cable industry in particular will be pressuring for the right to carry DBS signals; it is probable that CANCOM affiliates would do so as well. In such a situation, CANCOM may find itself in a position where some of its affiliates - especially uncabled affiliates who have limited capacity - could choose to disconnect some or all of the CANCOM services because others are considered more attractive. Even if a firm regulatory stance is adopted to separate "community" services provided by CANCOM from "direct" services provided by Company X, CANCOM affiliates would still face the prospect of some of their customers disconnecting from their service and purchasing home reception equipment, depending on the attractiveness of the alternative service and its cost.

Although Telesat holds out hope that CANCOM could on a 6/4 GHz basis enlarge its revenues through direct-to-home delivery, even in competition with a 14/12 GHz service, the potential negative impacts from another service provider on the company's revenues from this market segment, as well as on its community market, must be recognized. <u>It is unlikely that two service providers could prosper in a market that is relatively small, geographically remote and dispersed, difficult to access, and costly to service</u>.

F. International (U.S.) Developments

Another form of competition which could have a negative impact on Canadian service to the underserved market is provided by U.S. services available on satellite, whether intended for direct reception or not. Currently, thirteen U.S. satellites operating in the 6/4 GHz band carry over 100 channels of unscrambled television programming, freely available to Canadians with 6/4 GHz earth stations. It is estimated that there are well over 20,000 such stations in Canada now, and the numbers are projected to double in the next year.

The first U.S. dedicated 12 GHz DBS operation in existence is United Satellite Communications, Inc. (USCI), operating five full-transponder services on Anik C-2. It is now marketed in six urban centres in the northeastern United States. This service will be moved to the GSAT satellite when it is launched in the fall of 1984. The service is scheduled to be scrambled.

The FCC in the U.S. has licensed a total of eight DBS applicants, under a very loose regulatory approach with little attempt to assess the financial viability of the proposed services. Of the applicants, Satellite Television Corporation (STC) plans a low power DBS service on a modified 12 GHz satellite to be launched late in 1984, and a dedicated high-power DBS satellite for 1986. The other applicants are all currently entering into contractual arrangements for procurement of high power satellites, although early market experience may lead some of them to trade off high power for lower power with more transponders per satellite.

It is worthwhile noting that, although four of the eight applicants propose to offer initial services in the western and mountain time zones where most of the underserved households in the U.S. are, there is more emphasis on delivering more television signals to urban markets, in direct competition with terrestrial systems. It is felt that, in order to compete effectively, DBS will have to deliver new programming services which are distinctive from commercial television services. Many of these will be scrambled, but some will be open and advertiser supported.

Depending on the number of services which survive and the number of channels which the market indicates should be offered, DBS could add another twenty to forty programming services to the U.S. roster. Many of these will include a significant new programming component. They will be receivable in the most densely populated parts of southern Canada with small earth station antennas. (The existing USCI service can be received in Ottawa using a 1.2 metre antenna.) It is unclear whether there are legal or regulatory constraints which would prevent the sale of U.S.-based subscription DBS services in Canada, and vice versa. This issue has not been addressed in bilateral discussions.

The legal regime applicable in Canada to the reception of U.S. DBS services would probably be as follows. Individuals and other non-broadcasting receiving undertakings would benefit from the statutory exemption of the Radio Act for the reception of these "broadcasting" signals, or else would fall within the class of TVRO owners exempted by Ministerial regulation. The CRTC would regulate the reception and distribution of these services by its licensees. If an operation involving subscription sales of U.S. DBS services on an agent basis were established in Canada (similar to Northstar Home Theatre's current affiliation agreements with pay-TV licensees), the Commission might take the view, as it did with Northstar, that it has no jurisdiction over such an operation. However, depending on the nature of the relationship existing between the U.S. DBS operator and the Canadian agent, a case could probably made that one or the other, or both, are operating at least in part a broadcasting undertaking in Canada, and are therefore subject to the CRTC's jurisdiction. This is an area that requires bilateral discussion with the U.S.A., as there are some "trade in services" elements involved.

DBS developments in the United States are not a new threat to the Canadian broadcasting system and cultural sovereignty, but rather a volume addition to the existing threat posed by the extensive availability of American programming. (Direct-to-home satellite programming will, however, be available over a much wider geographical area.) In view of the fact that any direct-to-home delivery service in Canada prior to 1990 will simply extend existing services and not generate new programming, the issue posed by the broadcasters related to the trade-off between the cost of utilizing an expensive distribution system to extend services, and the resources available to produce quality Canadian programming to compete with American services, becomes even more pertinent.

G. Regulatory Concerns

The position of the CRTC on licensing a direct-to-home satellite broadcasting service is not known at this point. Obviously, the financial viability of such a service would be of major concern to the Commission. In light of previous decisions regarding extension of service initiatives, it is reasonable to conclude that the Commission would not have any fundamental difficulty with a service that delivered existing programming to underserved areas, particularly on a subscriber basis.

However, recent actions of the Commission with regard to proposed delivery of services to individual households lead to confusion regarding its regulatory stance on this issue. The Commission has informed Northstar Home Theatre, Inc. that it does not need a broadcasting licence to act as an agent in sales of pay television programming to individual households which install satellite reception facilities, presumably because the pay television companies are programmers and network licensees. On the other hand, CANCOM, which is licensed to deliver programming only to cable and rebroadcast affiliates, has recently entered the direct-to-home delivery field without any intervention from the Commission as well.

Unless the Commission clarifies who should be permitted to deliver broadcasting services direct to individual homes, and under what circumstances, some broadcasters who are not currently satellite users will put their signals on satellite, ostensibly for direct-to-home delivery purposes, and effectively become available in all markets. This may become a practical scenario if the issues of subscriber-supported versus advertiser-supported services, and restriction of markets are not dealt with. Furthermore, the regulatory stance of the Commission with regard to a consortium packaging existing programming for delivery direct-to-home needs to be clarified.

One further issue which may pose regulatory problems for the Commission is Telesat's proposed participation in a direct-to-home broadcasting service, in view of Telesat's mandate to provide just and equitable service as a carrier. There are regulatory and policy issues related to this which must be resolved, and will like centre around the actual relationship between Telesat and its subsidiary.

H. Issues for long term DBS development

The submissions in response to the call for public comment generally contained fewer and less substantive comments on long term DBS than on direct-to-home services using existing satellite facilities. However, several issues tend to come to the fore. These can be characterized as economic, institutional and programming issues.

Most who commented were of the opinion that Canada probably does not need and cannot support a full-power dedicated DBS system. The high cost of such a facility, coupled with a relatively small market in Canada, was noted as the main deterrent to its development. The possibility was cited that, rather than providing a substitute for basic program delivery, DBS at 14/12 GHz may provide a more experimental or narrowcast method for delivering enhanced (EDTV) or specialized audio and television services.

On the question of whether DBS be competitive or complementary to existing distribution systems, opinion among those in the broadcasting and cable industry was unanimous that existing terrestrial and fixed satellite systems should continue to play a major role in distribution of programming. Many of those who commented felt that consideration should be given to replacing existing satellite facilities with a hybrid system which could feed terrestrial facilities and have sufficient power to provide direct-to-home broadcasting. The cable industry in particular came out strongly in support of this view and noted that any services available on DBS should also be made available on cable.

On the question of programming, most respondents, with the exception of one or two, did not feel that DBS has particular potential to stimulate new programming services. Most saw it as a means of delivering existing programming services, especially to individuals who could not effectively be reached by other means.

In keeping with the government's broadcasting strategy, the Department of Communications does not view DBS as a vehicle to replace terrestrial delivery systems or to generate significant amounts of new programming, but as a delivery mechanism to complement and extend the reach of the existing broadcasting system. In particular, it is an appropriate vehicle to extend programming choice to communities and dispersed households in the underserved market.

I. Scenarios

The following two major delivery scenarios are proposed for consideration.

1. Extension of broadcasting services via 6/4 GHz (including direct-to-home delivery) until 1990.
2. Delivery of services via 14/12 GHz for direct-to-home broadcasting until 1990.

Each of the scenarios will be examined separately. The advantages and disadvantages are not ranked in any order of priority.

1. Extension of services via 6/4 GHz

Advantages

- does not require dislocation or realignment by major satellite broadcasters (CBC and CANCOM), or impose extra costs on broadcasters
- would not disturb existing users of Anik C (e.g. - by requiring a move between satellites, or to full-transponder mode, if one or more Anik C satellites are dedicated to a 14/12 GHz direct-to-home service)
- provides better service to the far North
- does not disturb existing 6/4 GHz infrastructure in remote/rural areas
- an attractive programming package already exists on Anik D

Disadvantages

- does not promote new traffic for Telesat, with consequential adverse impact on Telesat's revenues
- more costly, larger dishes required (though prices may still decline)
- provides no protection for broadcast reception from interference in this band
- market penetration would probably be smaller than with a 14/12 GHz service
- limits experience in marketing direct-to-home broadcasting services, which could be useful in planning for future services
- no spin-off benefits for pay-TV services currently on Anik C

2. Delivery of services on Anik C

Advantages

- demonstrated step towards provision of direct-to-home broadcasting services and a positive step towards extension of services to underserved areas
- may promote new traffic on Anik C, with beneficial effect on Telesat's revenues
- less costly to individual consumer, and smaller dishes can be used
- more protection for reception by individuals
- market penetration will probably be higher in view of cheaper consumer equipment; more experience with direct-to-home delivery will be gained
- possible industrial benefits to Canadian suppliers of 14/12 GHz equipment

Disadvantages

- current satellite broadcasters face some realignment (e.g. CBC to uplink additional signals; CANCOM the decision whether to switch signals to Anik C or duplicate services; existing Anik C users may need to move between satellites or change to full-transponder mode of operation)
- costs to broadcasters are substantially higher for all Canada coverage
- coverage in the far North is not good
- current CANCOM affiliates could be faced with purchase of more equipment
- competitive scenario may develop in underserved market with adverse impact on financial viability of players

Subsets of Option 2

These are several technical options related to option 2 which are briefly outlined for consideration:

Full-transponder use of one Anik C

Advantages

- more revenue for Telesat
- smaller dishes, less costly for consumer

Disadvantages

- less channel capacity
- higher costs to broadcasters
- cannot accommodate switch of all CANCOM signals

Half-transponder use of one Anik C

Advantages

- greater channel capacity
- lower costs to broadcasters for transponder capacities
- could accommodate wholesale switch by CANCOM

Disadvantages

- less revenue for Telesat
- larger and more costly dishes are required

Full-transponder use of two satellites

Advantages

- would fill up Telesat's excess capacity, with beneficial effect on its revenues
- smaller dishes could be used

Disadvantages

- substantially greater costs to broadcasters
- problem of splitting services between satellites
- steerable equipment required to receive all services

With regard to the above scenarios it should be noted that the question of whether to use an Anik C in the half-transponder or full-transponder mode is of major importance. Supporters of the use of Anik C for direct-to-home delivery argue almost unanimously for use in the full-transponder mode. They point out that, because of power levels and coverage areas, use in the half-transponder mode requires larger reception antennas, and in terms of costs to the consumer and size of installation presents very little advantage over using Anik D for direct-to-home delivery. It is argued that smaller (1.2 metre) and less costly antennas would allow for greater market penetration, if the full-transponder is used.

The trade-off is with channel capacity and costs to the broadcaster. Use in a full-transponder mode allows for only eight program channels (per satellite with full-Canada coverage). Furthermore, the cost doubles over use in a half-transponder mode; the current rates are $4,064,496 for full-Canada coverage (unprotected, non-premptible). Even taking into account the decrease projected by Telesat, if more transponders are sold, it is unlikely that the cost for a full-Canada service would drop to $3 million.

J. Options for Direct Government Intervention

Any of the scenarios outlined above could be supported by government initiatives designed to encourage the various players to follow a particular course of action. What follows is a "shopping list" of options for action available to the government. It is important to note that all options are not mutually exclusive. It is also important to note that most carry a significant price tag.

Measures to encourage extension of services through 6/4 GHz

- provide subsidies to communities otherwise too small to cable economically, to promote the development of cable systems (one estimate of a national cable infrastructure program based on a 25% federal subsidy and a 10% penetration into the uncabled market projected costs of $50 million).

Measures to encourage direct-to-home delivery via 14/12 GHz

- promote the Telesat concept of Company X, and grant Telesat's request for authority to allow it to participate in Company X;
- subsidize rates on a 14/12 GHz satellite through a sliding subsidy program designed to equalize rates with Anik D

The following are some examples of possible subsidy programs, based on the full loading of one satellite, in both half- and full-transponder modes, and use of a medium grade of service (unprotected, non-pre-emptible)(1). For the purposes of this comparison, Anik D rates are assumed to remain at $1.3 million per transponder. The cost for a full-Canada service on Anik C in the full-transponder mode has been rounded to $4.1 million, and that for half-transponder mode to $2.0 million. The cost differential with Anik D for one fully loaded Anik C satellite is, therefore, $22.4 million in the full-transponder mode ($4.1M - $1.3M x 8) and $11.2 million in the half-transponder mode ($2.0M - $1.3M x 16).

(1) Basing the calculations on the lowest grade of service (unprotected, pre-emptible) would result in a lower cost subsidy program. However, at the time the subsidy analysis was done, a number of Anik D transponders were leased at the medium grade of service.

Example 1: Full subsidy, 1985-1990, assuming existing Anik C and D rates

	1985	1986	1987	1988	1989	1990	Total
full-transponder	22.4M	22.4M	22.4M	22.4M	22.4M	22.4M	134.4M
half-transponder	11.2M	11.2M	11.2M	11.2M	11.2M	11.2M	67.2M

Example 2: Full subsidy, 1985-1990 assuming decreased Anik C rates of $3M and $1.5M

	1985	1986	1987	1988	1989	1990	Total
full-transponder	13.6M	13.6M	13.6M	13.6M	13.6M	13.6M	67.2M
half-transponder	3.2M	3.2M	3.2M	3.2M	3.2M	3.2M	19.2M

Example 3: Sliding subsidy(2), 1985-1990, assuming existing Anik C rates

	1985	1986	1987	1988	1989	1990	Total
full-transponder	22.4M	17.9M	13.4M	9.0M	4.5M	0	67.2M
half-transponder	11.2M	9.0M	7.6M	5.1M	2.6M	0	35.5M

Example 4: Sliding subsidy(2), 1985-1990, assuming decreased Anik C rates of $3M and $1.5M

	1985	1986	1987	1988	1989	1990	Total
full-transponder	13.6M	10.9M	8.2M	5.4M	2.7M	0	40.8M
half-transponder	3.2M	2.6M	1.9M	1.3M	.6M	0	9.6M

(2) Note: The sliding subsidy programs are based on declining subsidies of 100% of cost differential, 80%, 60%, 40%, 20% and 0%.

K. Conclusion

The government's broadcasting strategy, announced in March, 1983, contained an equalization of services thrust designed to reinforce the national effort to equalize the level of broadcasting services throughout the country by employing all available distribution technologies. In view of the fact that there are in Canada approximately 1.5 million households which are too dispersed to be served effectively by cable or rebroadcast operations, the delivery of broadcast programming direct to home by satellite becomes an important vehicle to achieve this policy objective.

As a first step to reviewing this issue, the Department of Communications undertook over a two year period a major studies program, culminating in the release last June of the information paper Direct-to-Home Satellite Broadcasting for Canada. The call for public comment on that paper was a second step, leading to further analysis of the issue. The conclusion of that analysis is that the government should encourage development of a direct-to-home broadcasting service on existing satellite facilities, and undertake a liaison role between Telesat and broadcasters in considering the question of an effective direct-to-home broadcasting capability in the design for the next generation of communications satellites, to be launched between 1990 and 1992.

With regard to a direct-to-home broadcasting service prior to 1990, it is felt that the Anik C series of 14/12 GHz satellites would be a better alternative for delivery (assuming a slight tilt of the satellite to improve coverage in the North). Further extension of services using 6/4 GHz satellites is possible through further development of small community broadcasting undertakings. In addition, CANCOM is planning, through a dealership network, to market actively a 6/4 GHz "DBS Service", using relatively inexpensive personal decoders. Although this type of extension of services promotes easier access, especially by community broadcast receiving operations, to existing programming packages on these satellites, it does not provide the individual consumer with a truly low-cost, aesthetically pleasing, or potentially interference-free installation.

Both the 6/4 GHz satellites and the 14/12 GHz satellites have advantages in terms of addressing different segments of the underserved market. The decision on how to utilize the technology most efficiently to deliver an adequate selection of programming to all parts of the market should be left to a consortium of commercial interests.

The government role in promoting development of a direct-to-home broadcasting should be in line with the institutional model number two outlined in Chapter 10 of Direct-to-Home Satellite Broadcasting for Canada. The government should seek to foster the introduction of a direct-to-home broadcasting service by co-ordinating planning activities among interested parties, as opposed to playing a role financially in the establishment or maintenance of such a service.

This co-ordination role should be undertaken within certain broad policy parameters, in line with the broadcasting strategy objectives. The role of direct-to-home broadcasting services should be defined as complementary to existing broadcasting delivery systems, and in particular, as an effective vehicle for delivering broadcast programming to households which are currently underserved. The focus of direct-to-home satellite broadcasting should be to deliver existing broadcast programming to this market, as opposed to generating new programming. Furthermore, since the underserved market is somewhat limited and difficult to access, a single service aimed at remote communities, dispersed households, and the extra cable market seems most likely to succeed.

In order to advance this issue, the following actions could be undertaken at this point:

- The Minister of Communications could write to the Chairman of the CRTC, outlining the results of this analysis, and suggesting that the Commission take whatever regulatory action might be appropriate to promote the development of direct-to-home satellite broadcasting.

- The Minister could approach Cabinet for the Order-in-Council authority required to allow Telesat to participate in a direct-to-home broadcasting venture using existing satellite facilities, once the required subsidiary company has been incorporated by Telesat.

- In consultation with the Department, the CBC could be asked to assess options for its role in direct to home broadcasting services, consistent with the statement in the CBC strategy that "the government has endorsed fulfillment of the intent of the Accelerated Coverage Plan, while giving greater consideration to more cost-effective alternatives, such as the use of new satellite technologies".

- Further consideration could be given to a structure whereby the Department can become involved in conjunction with Telesat Canada, the terrestrial common carriers, and broadcasters, in a planning exercise for the next generation of satellites. This planning should take into account the needs of the broadcasting system in terms of cost, coverage and distribution, and allow for the integration of a direct-to-home delivery capacity on the satellites.

In the analysis of this issue, the possibility of providing government subsidies designed to equalize rates between the two series of satellites, in order to promote services using Anik C, was considered. However, it was decided that this would have the effect of creating something of an artificial environment with regard to cost of satellite delivery of broadcast programming. Furthermore, the effect of such a program on the broadcasting system is unpredictable: which services would be likely to take advantage of the opportunity, and how would it affect their business operations and those of their competitors? Is it realistic to suppose that such a subsidy program could be discontinued after several years? Should resources be directed at this activity as opposed to further support of program production? And finally, how would such a program be administered? For these reasons, a subsidy program is not considered to be an appropriate response to this issue at this time.

Appendix A

Summary of submissions in reply to the

Gazette notice on Direct-to-Home Satellite Broadcasting

I. Introduction

On October 15, 1983, the Department of Communications published in the Canada Gazette a notice calling for public comment on the short and long term issues surrounding the introduction of direct-to-home satellite broadcasting in Canada, and on the feasibility of using existing satellite facilities to develop direct-to-home satellite services.

In response to that call, a total of twenty-two public submissions was received. As the various submissions comment on either or both of the long-term and short-term issues, the position taken in the submissions on these matters will be considered separately. First, the feasibility of a direct-to-home service in the 1980's will be addressed, and then the issue of direct broadcasting as it relates to the replacement of existing satellite facilities in 1990.

Direct-to-Home Broadcasting Services Using Existing Satellite Facilities

A. The Telesat Model

Telesat Canada proposed the most detailed model of direct-to-home broadcasting service, utilizing Anik C, and based on the results of a market survey conducted by the company in December, 1983. Contact with a sample of 600 households selected randomly from rural and remote areas of Canada indicated that up to 55% of respondents would consider purchasing or leasing receiving equipment, assuming an acceptable price level and programming package. Respondents were given a choice of three options: existing C-band services (8 CANCOM channels and the possibility of accessing U.S. 6/4 services), with a 3.0 meter receiver at a current cost of $2,500; a Ku-band half-power service consisting of a possible 16 channels, with a 1.8 meter dish costing $1,500; and a Ku-band full-power service consisting of eight channels and a 1.2 meter earth station costing $1,000. (It should be noted that these prices are estimates or averages. The cost of a 3 meter C-band

dish for home use can range up to $4,000 without descrambler; Northstar Home Theatre is planning to market a 1.8 metre dish with descrambler for $1,600; some estimates place the cost of 1.2 metre earth stations at $600 without descrambler within the near future.)

The Telesat submission states that the consumer choice was a full-tranponder Ku-band service of 8 channels, and that this choice was based on the lower cost for receiving equipment. In further support of its preference for Ku-band service over C-band service, Telesat cites better regional coverage and freedom from radio frequency problems. The Telesat market analysis also indicates that use of Anik-C in the full-transponder as opposed to the half-transponder mode would allow for a faster market penetration, in spite of the lesser amount of programming available. This is based on the lower cost of reception equipment, plus the fact that those respondents expressing a preference for the larger programming package would switch to the full-power, eight channel offering if their first choice was not available, whereas the reverse is not true.

Based on the above, Telesat proposes a direct-to-home satellite service using two Anik C satellites in the full-transponder mode. English services would be on Anik C3 and French services on Anik C2, utilizing half-Canada beams on both satellites. The package would include a CBC service available free of charge, educational and private Canadian and American network signals available for a subscription fee ($20/month) and pay and discretionary services as a final tier. A total of eleven channels with full Canada coverage and three (French) with half Canada coverage is projected. (Given current Anik C rates, this represents an annual tariff charge of approximately $25.5 million, based on use of unprotected, non-preemptible channels.)

Telesat proposes that a new entity (Company X) be created to provide this service. In Telsat's view, equity participation could be expected from broadcasters, common carriers, hardware manufacturers and distributers.

Telesat also proposes that section 33 of its act (which prohibits Telesat's participation in broadcasting enterprises) be amended so that it can take an active equity position in Company X. It further points out that Company X is not considered to be competitive with CANCOM, as the CANCOM market of communities over 300, as well as the percentage of respondents expressing a preference for C-band technology, were specifically excluded from its economic viability forecast. In fact, Telesat proposes that CANCOM might want to become a partner in Company X.

Telesat's economic viability forecast indicates an initial capital funding requirement of $45 million for Company X, and a pay-back period of 3.7 years. (The capitalization costs include charges for transponders to the end of the pay-back period, as well as estimated capital costs for uplinks, encoding and decoding equipment.)

B. The CBC Position

The CBC submission states that:

> "The government's and CBC's broadcasting strategies are dominated by the imperative to increase the amount and quality of Canadian programming available and viewed by Canadians. Though important for its distribution objectives, the Corporation believes technology must not be allowed to lead content, nor must its development dilute resources for programming."

The point that the cost of reaching all Canadians with CBC services may involve some trade-offs with the CBC's primary strategic objective -- achieving more Canadian programming -- is underscored in the submission. However, the Corporation is also determined to "stay in tune with satellite developments" and to play a leading role in the definition and design of an appropriate Canadian direct-to-home broadcasting system. Its objectives in terms of satellite delivery include improved signal reliability, extended

service reach, increased operational efficiency and flexibility, and delivery of new types of services.

Within this general framework, the CBC feels that the Anik D series of satellites best meets its basic distribution needs in the near term. The Corporation points out that it is satisfied with the performance and characteristics of the 6/4 GHz satellites, as they lend themselves ideally to the geography and population distribution of Canada and are most appropriate for national networking and northern and remote services. The Anik C series, with its more specific footprints is useful for regional distribution, satellite news gathering, and where frequency co-ordination problems exist. The Corporation's analysis indicates, however, that the 14/12 satellites are appropriate for its network and regional distribution needs only in British Columbia, Quebec and Ontario, and that at some additional cost to the CBC. Furthermore, the submission points out that the 14/12 GHz satellites would present reliability problems if CBC broadcast network standards are to be met, especially in adverse weather conditions, and do not allow for good coverage of the North.

The Corporation also considers that economics mitigate against its use of the Anik C series for distribution applications. The cost of providing a national program service using 6/4 GHz is $1.45 million per channel per year, compared with $3.9 million for 14/12 GHz. Furthermore, the submission points out that prevailing satellite usage patterns and hardware investment are in 6/4 GHz technology and dishes, and that cost for 14/12 GHz reception equipment might therefore not be much less than for 6/4 GHz.

The CBC conclusion is that the 6/4 GHz system "... already exists, and functions well with our terrestrial system. Much has been invested in its creation and maintenance and a substiantial user base has developed". Furthermore, the Corporation feels that much progress in extension of services can still be made through an approach using existing 6/4 GHz satellite technology. For example, the Corporation is studying the possibility of assisting small cable concerns and community groups in the

acquisition and operation of suitable earth receiving stations, as a follow-on to its Accelerated Coverage Plan.

Nevertheless, the CBC is interested in possible applications of 14/12 GHz technology for coverage extension (direct-to-home) purposes. It points out that the sort of consortium approach proposed by Telesat might make this use more economical and therefore more attractive, and that the CBC would consider it imperative to have its services included in any such package. For this purpose, the Corporation favours full-power use of Anik C.

C. The CANCOM Submission

Canadian Satellite Communications Inc. (CANCOM), favours continued use of 6/4 GHz satellites to reach underserved areas and individuals. In the company's opinion the 6/4 GHz satellites are best suited for reaching remote and underserved markets because they provide better coverage, lower rates for the operator, and larger channel capacity. Furthermore, CANCOM already has a large base of affiliated operators (about 250 operational) who would have to incur costs to convert reception equipment, and CANCOM itself would incur substantial conversion and added operating costs to switch its signals from Anik D to Anik C.

The submission cites certain advantages of the 14/12 GHz technology which are recognized: the band is free from radio interference, and it allows for the use of smaller and less costly TVRO's. However, it cites as major deterrents to the use of this technology higher transponder and uplink costs, and the fact that there is currently no infrastructure of 14/12 GHz reception equipment in place in underserved areas. The submission also argues that costs of 14/12 GHz reception equipment are currently comparable to 6/4 GHz TVRO's, because most of the existing market infrastructure has been geared to use of 6/4 GHz satellites. (This conclusion regarding cost is questionable, in view of developments such as Northstar's plans for marketing 14/12 GHz TVRO's.)

The company has provided an estimate of the conversion and added operational costs it would incur to switch its signals from Anik D to Anik C. These are predicated on use of two half-Canada beams in half power mode, as the full-power mode would not provide sufficient channel capacity to accommodate all of CANCOM's signals. The one-time additional costs for capital expenditures include conversion costs for existing uplink facilities, and building one new Western uplink and an operations centre to co-ordinate services on the Western beam; these total $2.3 million. Additional operating costs include higher transponder rates on Anik C and additional manpower costs for the Western operational centre; these total about $6 million per year, most of which in in additional transponder costs. (It should be noted that these estimates include provision for TCTV to be uplinked on both beams, and the four American networks to be uplinked from different sources on each beam). No estimate is provided of the cost to affiliates of converting from 6/4 GHz to 14/12 GHz receiving stations.

For reasons of economics and existing infrastructure, then, CANCOM argues for continuing to service remote and underserved areas and individuals via the C-band satellites. The submission points out that serving the more than 1 million scattered households left unserved or underserved is a costly and a risky proposition, because there are very few well-organized networks which can efficiently install equipment in every region of the country and in hard to access localities, nor enough experienced servicing people available to make adjustments or quickly repair broken equipment. CANCOM states that if this is true for the 6/4 GHz terrestrial equipment which has been and still is proliferating in Canada over the last four to five years, it is even more true for the 14/12 GHz TVRO infrastructure which is in its infancy, and wonders how long it will be before such an infrastructure is in place.

As an alternative, CANCOM, like the CBC, proposes further exploitation of the potential of the C-band for extention of services. It favours a government subsidy program to aid small underserved communities to establish cable systems. (CANCOM has also begun to market a low-cost "personal"

descrambler to be available to individual TVRO owners at about $500, which will allow the company to more efficiently market its services on a direct-to-home basis. However, quantities of this descrambler are currently limited to 5,000.)

D. Private Broadcasters

Among the submissions from private broadcasters, Northern Television Systems (WHTV, Whitehorse), Western International Communications, Ltd., and the British Columbia Television Broadcasting System, Ltd. (all CANCOM shareholders) support the CANCOM position. They point out that a DBS service to remote and underserved ares should not be encouraged in competition to CANCOM which, together with CBC on Anik D, will provide a very attractive programming package. BCTV points out that the strength of the Canadian broadcasting system depends first on the programs it delivers and secondly on the quality of signal provided. "How the programmes are delivered is something better determined by private capital and personal consumer decisions than by public policy direction."

The CTV submission likewise focuses on the question of programming:

> "Newer distribution technologies, no matter how attractive to technocrats or investors, do not address the critical issue of programming; the massive investment in ingenuity and imagination necessary to bridge the final few feet between the television screen and the eyes, brains and hearts of viewers."

CTV believes that the healthy broadcasting system is based on a mix of local station services and national services, that direct-to-home broadcasting is not necessary for the further development of the Canadian broadcasting system in the short term, and that the CANCOM experience proves that even less costly means of delivering broadcasting services to remote areas cannot be supported from subscription revenues from those areas alone.

Furthermore, CTV feels that the introduction of U.S. direct broadcast services poses no threat to the Canadian broadcasting system, because it is likely that such services will be scrambled and that the marketing of American subscription services will not be permitted in Canada.

CHUM Limited of Toronto submitted a position based on its participation in the Atlantic Satellite Network, broadcast on Anik C. The CHUM submission underlines the high costs of utilizing satellite technology to reach a comparatively small and thinly dispersed population, and states that the CANCOM experience has effectively proved that the economics of the use of satellites to service only remote and underserved areas do not work. In CHUM's view, a Canadian DBS system could be economically reasible only if it became the principal distribution facility for all signals described by the CRTC as "optional", to virtually all Canadian cable systems. CHUM's main concern with this scenario is the erosion of advertiser revenue for support of local broadcasting services and the consequent effect on local stations.

E. Educational Broadcasters

TV Ontario currently operates a service on a half-transponder of Anik C3 to feed its broadcast transmitters and some cable companies, which allows it to reach 92% of Ontario's population. A planned transmitter program would bring that coverage up to 99%. TVO agrees that "theoreticaly, the remaining remote population could be served direct-to-home if the cost of satellite receivers were affordable and people were motivated to acquire them". Given that the rural and remote market alone cannot sustain a separate satellite distribution system, the use of Anik C to bring conventional and pay services to all areas of Canada therefore makes sense.

With this in mind, TVO makes several recommendations, which include encouraging the immediate development of an interim hybrid DBS system by transferring CBC and CANCOM services to Anik C. TVO also recommends subsidizing home receivers to bring prices down to about $500 and promoting

subsidizing home receivers to bring prices down to about $500 and promoting active marketing, and making changes to Telesat rules to encourage Anik C use (e.g., transponder sharing, sub-leasing, and owner-operated uplinks). TVO further recommends amendments to copyright laws to reflect current technological developments, development of further financial incentives for Canadian program production, and a CRTC issues hearing within six months on the question of introduction of DBS services.

ACCESS (Alberta Educational Communications Corporation) notes that it plans to develop a full service to be transmitted via FSS to CATV systems and TVRO's in rural Alberta, and that its major concern is to reduce space and earth segment costs for the distribution of the service. It expresses no current preference for a particular technology.

F. Northstar Home Theatre

Northstar Home Theatre plans to launch its "direct-to-home" service to the rural areas of Canada in mid-1984. This service will consist of delivery via 1.8 metre TVRO's of the programming currently available on Anik C: educational services (TVO, Knowledge Network), the Atlantic Satellite Network, and pay-TV services (Superchannel, First Choice, Premier Choix/TVEC) with which Northstar has affiliation agreements.

The submission states that Northstar has been pursuing the development of a multi-channel addressable scrambling system and the mass production of low cost antenna systems. A contract signed with General Instruments in October, 1983, will provide Northstar with 1.8 metre TVRO's and descramblers which can be marketed for approximately $1,600.

Northstar is of the opinion that this effectively constitutes a direct-to-home service, but that such a service will not grow without the addition of more programming on Anik G. The submission states that Northstar plans, in due course, to take steps to increase the amount of

programming on Anik C at its own expense. However, in the meantime it believes that circumstances call for specific policy intervention by the government either to require Canadian programming services to use Anik C, or to require Telesat's rates for national coverage on Anik C to be comparable to Anik D.

Although the submission does not directly address the issue of full-transponder or half-transponder use of Anik C, all the services which Northstar plans to deliver are currently operating in the 2 TV per transponder (half-transponder) mode.

G. The Cable Industry

The Canadian Cable Television Association believes that direct broadcasting should develop as a satellite system primarily servicing cable head-ends and broadcast transmitters and, as an adjunct, individual TVRO's in underserved areas. This would mean that the market base for the DBS portion would be limited. The CCTA further submits that cable systems must be able to carry all the signals carried by a direct broadcast system, including any U.S. signals.

The CCTA submission notes that the slow implementation of DBS could result in lost opportunities for the origination of new programs and for the manufacture of DBS equipment by Canadian industry, and would leave Canada ill equipped to respond to the availability of American unscrambled DBS signals in this country. For these reasons, the CCTA favours the introduction of an interim direct-to-home service on Anik C. It notes, however, that given the competitive alternative available from 4GHz installations and with 4GHz TVRO's approaching a $2,000 cost figure, an Anik C direct-to-home service would have to be considerably enhanced beyond the current Northstar package before it becomes viable.

Rogers Cablesystems Inc. notes that, de facto, DBS already exists in the form of individually owned and operated TVRO's largely aimed at U.S. satellites. This de facto DBS has created a new form of underserved Canadian - the cable subscriber who is not allowed to receive the signals TVRO owners receive. It is vital that cable operators be able to offer to their subscribers signals that are being received from satellites by individuals.

Rogers considers that the use of Anik C as an interim direct-to-home service may provide a market base for later higher power DBS, and that pay and projected specialty services could benefit from the expansion of market potential. But it is unclear whether current Anik D users are prepared to move to Anik C, and in any case, the basic issue of DBS providing competition for small market broadcasters and cable operators would remain.

H. Provincial Points of View

Three provinces - Newfoundland, Nova Scotia and Ontario - submitted opinions on direct-to-home broadcasting. Newfoundland is of the opinion that direct-to-home satellite technology can offer an opportunity to further reduce the disparity in access to programming services in Canada, but that this is dependent on reasonable charges for reception facilities and subscription services. Existing facilities should be used to deliver existing programming services. Newfoundland suggests that as capacity allows, existing subscription services should be delivered via Anik C.

The submission of the Nova Scotia Department of Transport supports the development of a broadcast satellite system to provide a wide range of high quality television services to rural residents of Nova Scotia who will not likely receive such services by any other means (estimated at 100,000 households). These services should consist of high quality Canadian and American programming in a package comparable to that provided by urban cable systems. In order to ensure reasonable market penetration, antennae should

be 1 metre or less in size and $1,000 or less in price. Nova Scotia feels that the Anik C satellite is capable of providing this service.

The province of Ontario feels that Anik C is the most viable means of introducing interim DBS services in Canada, and that the federal government should move quickly to encourage the introduction of such a service in order to combat the possibility of spill-over from American DBS satellites.

Ontario further recommends that DBS be used as a method of distribution to cable, SMATV, and multi-point distribution systems as well as homes, in both urban and rural areas. This will increase the economic viability of both interim and long-term DBS, and provide an additional delivery vehicle within the broadcastng system.

> "Ontario views interim DBS as an excellent opportunity to not only enhance Canada's communications environment through the extension of broadcast services to remote communities, but to introduce new and innovative services across the entire country, and thereby stimulate domestic and export markets for Canadian programming. Indeed, by limiting the role of interim DBS to extending services to rural areas, federal policies would only serve to undermine the opportunities inherent in DBS technology."

Ontario also recommends a loose regulatory environment for the introduction of DBS and the encouragement of a competitive climate, as well as an early CRTC issues hearing on the topic.

I. The Carriers

Submissions were presented by Telecom Canada, Bell Canada, and the British Columbia Telephone Company. The Telecom Canada Forum (representing the common carriers and Telesat) stressed that the overriding issues surrounding the introduction of direct-to-home services were economic and

financial, and suggested that "... in light of the present economics of DBS, and the numerous market factors that remain somewhat speculative, the Forum strongly recommends that maximum use of existing satellite facilites be made prior to embarking on a "true" DBS system for Canada". Specifically, Telecom supports the use of Anik C because it would stimulate optimal utilization of existing satellite facilities, contribute to equalization of services, and provide an invaluable concrete market test for future DBS.

Bell Canada likewise feels that more should be done to fully exploit the current satellite approach to providing television services to smaller and remote communities, and suggests that providing "financial incentives" to these communities might be a less costly solution at this point that building a new satellite facility. In addition, Bell notes that the migration of broadcasting users from still under-utilized existing satellites to a DBS facility would have a serious negative impact, and points out that the implementation of a DBS system would require the premature replacement of satellite dishes in locations already served by CANCOM.

B.C. Tel submits that initiatives such as CANCOM and Northstar have already improved television services to remote and rural areas, and that the use of Anik C for direct broadcasting and/or new or expanded terrestial systems may be a less costly alternative for extending service than DBS. B.C. Tel also points out that quality programming is the key to combating challenges to Canadian culture values posed by U.S. services, and that DBS will not alter this circumstance. "... the question must be asked whether the public interest would not better be served by using the funds which would be spent on DBS to directly stimulate excellence in Canadian programming."

J. Other Submissions

SPAR Aerospace indicated that it is currently working to extend its capabilities with respect to DBS markets. It is undertaking internal

R and D activities of a preparatory systems and hardware development nature, activities presently oriented towards export markets, but would be most interested on applying its capabilities to any proposed Canadian system.

International Phasor Telecom Ltd. of Vancouver has also indicated an interest in being considered as a supplier for future DBS systems, and states that its Phasor Link technology for protection of satellite video signals has been developed with the DBS market directly in mind.

Issues for Long Term DBS Development

The submissions generally contained fewer and less substantive comments on long term DBS than on interim direct-to-home services. However, in reviewing the comments on long-term DBS development, several issues come to the forefront. These can be characterized as economic, institutional, and programming issues.

Most who commented were of the opinion that Canada probably does not need and cannot support a full-power dedicated DBS system. The high cost of such a facility, coupled with the relatively small market in Canada, is the main deterrent to its development. Telesat notes that "Future generations of satellites could involve a movement to higher power and operation in the Broadcast Satellite Service frequency band, however, this would depend on how the market evolves". CTV concluded from an economic analysis that there is no economic viability to a Canadian DBS system. CBC is also of the opinion that extremely high costs, combined with Canada's small population and market base, may render true high-power DBS impractical or irrelevant in the Canadian context. The Corporation notes that "it is quite possible that, rather than providing a substitute for basic program delivery, true DBS such as 17/12 GHz may provide a more experimental or narrowcast method for delivering enhanced (EDTV) or specialized audio and television services."

On the question of whether DBS should be competitive or complementary to existing distribution systems, opinion among those in the broadcasting and cable industry was unanimous that existing terrestrial and fixed satellite systems should continue to play the major role in distribution of programming. Only the Government of Ontario, as noted above, extolled the potential of DBS as a primary distribution means. Many of those who commented felt that consideration should be given to replacing existing satellite facilities with a hybrid system which could service terrestrial facilities and have sufficient power to provide direct-to-home broadcasting. The cable industry in particular came out strongly in support of this view and noted that any services available on DBS should also be made available on cable.

On the question of programming most respondents, with the exception of one or two, did not feel that DBS had particular potential to stimulate new programming services. Most saw it as a means of delivering existing programming services, especially to individuals who could not effectively be reached by other means.

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JAN 18 1995		
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