PATV STUDY PHASE FOUR:

USE OF A PAY PER CHANNEL SIMULATION MODEL TO ASSESS THE ECONOMIC

IMPACT OF VARIATIONS IN PRICE, TOTAL PROGRAM CONTENT, PERCENTAGE

OF CANADIAN CONTENT, AND PERCENTAGE OF FRENCH LANGUAGE CONTENT

J. HATCH   P. KUZDRALL   R. MORE

MARCH 31, 1981

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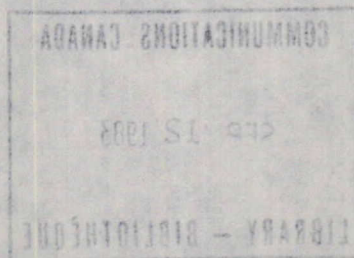
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I. MANAGEMENT SUMMARY

Beginning in the Fall of 1979, the Department of Communications (DOC) requested a four part study of the introduction of pay television (PATV) into Canada. This report is the fourth part of that study.

The purpose of this report is twofold. Firstly, it outlines a simulation model which can be used to assist the DOC and others in the formulation of public policy with respect to PATV. Secondly the report contains the results of several preliminary simulation runs.

Three different groups of simulation runs were conducted to assess the economics of (1) various price/foreign content scenarios, (2) various Canadian content scenarios, and (3) a Quebec only network. In addition the impact of PATV on individual cable companies was simulated.

Given the assumptions used in these runs it seems reasonable to conclude that a pay television network offering bilingual programming and Canadian content in excess of 30 percent is economically viable. Such a system would provide the Candian film industry with upwards of $170 million over a 10 year period. The economic viability of a French language only PATV system appears to be questionable. Finally PATV is likely to be a profitable pursuit for all but the very smallest cable companies.

II.   THE PAY TELEVISION PAY PER CHANNEL SIMULATOR

OBJECTIVE

The objective of this model is to simulate the effects of the introduction of pay per channel pay television (PATV) into Canada. The model has been designed so as to provide the user with the opportunity to quickly and easily ascertain the financial and market impact of changes in the size and value of marketing and cost parameters.
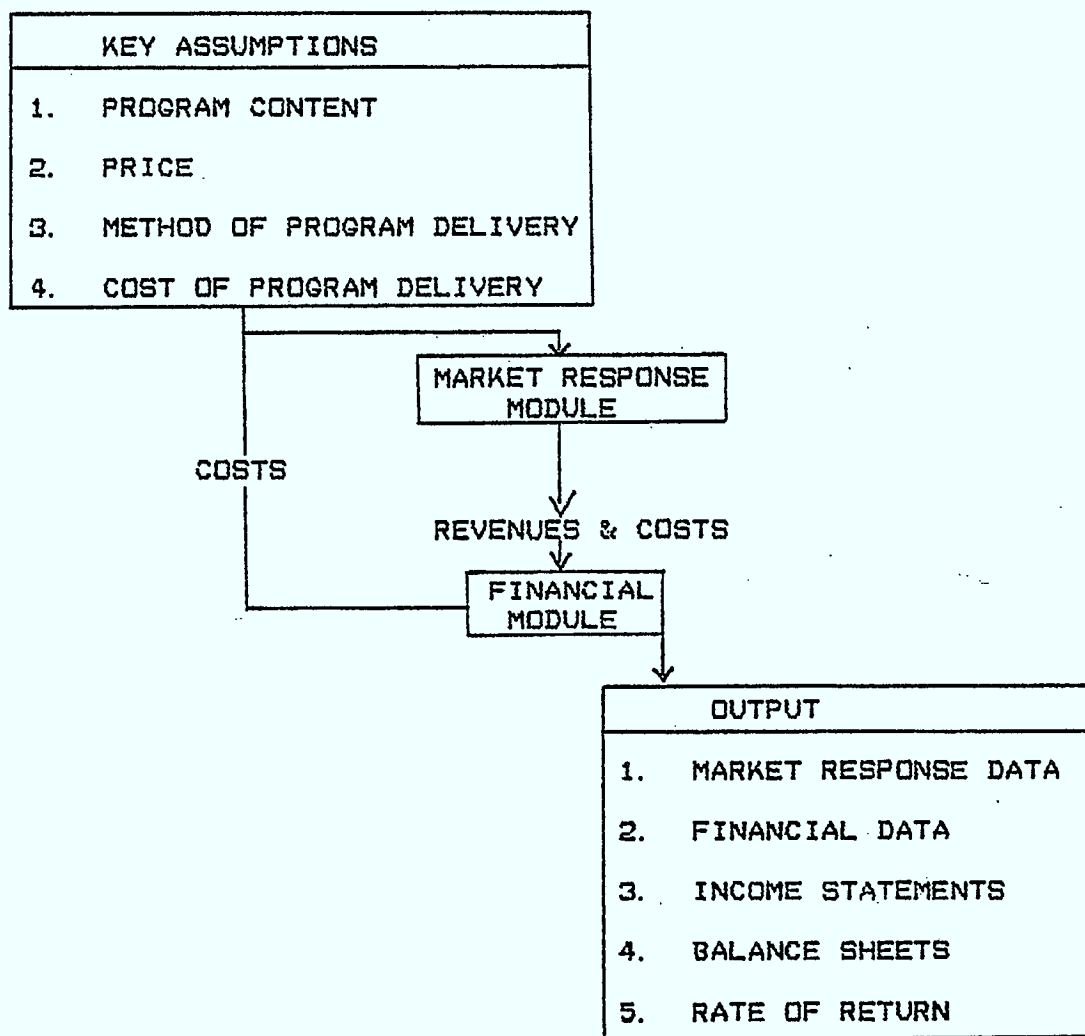
TECHNOLOGICAL OVERVIEW

It is assumed that a signal of a film or live event is beamed upward from a central location to a satellite. For special events portable sending stations could be used to send up a signal from almost anywhere in Canada. These simulations assume that three satellite transponders are available, two devoted to English language product and one devoted to French language product. The signal received by the satellite is beamed down to earth stations located at the head ends of cable companies. The cable companies scramble the signal and send it to those households connected to the local cable service. Households that wish to view PATV are equipped with a device which descrambles the signal. The descramblers are installed by the local cable company which also does all of the related service work including the provision of program information and the collecting of subscriber fees. In many urban centres there will be no available channels for PATV unless the customer already has or is willing to acquire a converter (brown box) which allows extended channel service.

SIMULATION MODEL OVERVIEW

Exhibit 1 illustrates the main components of the PATV simulation model.

EXHIBIT 1

OVERVIEW OF THE MODEL

```
┌─────────────────────────────────────────┐
│  KEY ASSUMPTIONS                          │
│                                           │
│  1.  PROGRAM CONTENT                      │
│                                           │
│  2.  PRICE                                │
│                                           │
│  3.  METHOD OF PROGRAM DELIVERY           │
│                                           │
│  4.  COST OF PROGRAM DELIVERY             │
└─────────────────────────────────────────┘
                    │
                    │        ┌──────────────────┐
         COSTS      │        │ MARKET RESPONSE  │
                    │        │     MODULE       │
                    │        └──────────────────┘
                    │                 │
                    │       REVENUES & COSTS
                    │                 │
                    │        ┌──────────────────┐
                    └────────│  FINANCIAL       │
                             │    MODULE        │
                             └──────────────────┘
                                      │
                           ┌───────────────────────────┐
                           │  OUTPUT                    │
                           │                            │
                           │  1.  MARKET RESPONSE DATA  │
                           │                            │
                           │  2.  FINANCIAL DATA        │
                           │                            │
                           │  3.  INCOME STATEMENTS     │
                           │                            │
                           │  4.  BALANCE SHEETS        │
                           │                            │
                           │  5.  RATE OF RETURN        │
                           └───────────────────────────┘
```

A network head office is set up to begin negotiating for the rights to show feature films and special events prior to the introduction of PATV. One or more regional offices are created to provide technical and marketing assistance to cable companies and to contract for local product. All network costs including fees paid to producers are variables which may be adjusted.

For marketing purposes the country is subdivided into 38 census market areas (CMA's). The model has the capability of either simulating entry into all of these markets at once or entering them on a gradual basis after the network has been set up. The consumer household is faced with a selection of movies and live events offered repeatedly throughout a given quarter. The selection is gradually changed over time. In order to receive PATV the household must pay a one-time installation fee for the descrambling device plus a monthly subscription fee.

The user of the model can vary the viewer response to PATV in every CMA. The level of viewer response and the resultant consumer revenue is determined in the Market Response Module of the simulation model which is discussed in Section III.

Once viewer response is estimated, the model computes delivery costs for the service. The major cost categories include the fee paid to cable companies, fees paid to producers, satellite usage and network operating costs. These costs and revenues are summarized by the model in the form of financial statements for both the network and individual CMA's as well as an internal rate of return calculation for the network. Calculation of the costs and generation of the financial statements are performed by the Financial Module. The Financial Module is discussed in Section IV.

COMPUTER PROGRAM OVERVIEW

The PATV simulation model is written in FORTRAN, is run on a PRIME 750 computer, and is in conversational mode. The simulation system currently consists of some 17 programs and 41 data files. All programs are internally documented.

III.   OPERATION OF THE MARKET RESPONSE MODULE

OVERVIEW OF THE MODULE

In order to perform a run of the model the user must first make
assumptions regarding program content. Content is specified in terms
of the number of new foreign movies, Canadian movies and live events
offered each quarter as well as the language in which they will be
offered. The user then makes an assumption with respect to the
quarterly subscription fee charged.

Given the assumed content and price the Market Response Module
goes through a series of quarterly iterations for each of the CMA's.
Each iteration consists of the nine steps seen in Exhibit 2.

As seen in the exhibit the starting point for the calculation is
the number of cable passed households. This is then multiplied by the
percent of households cabled to obtain the number of households which
are cabled and therefore capable of receiving PATV. The number of
cabled households is multiplied by a PATV signup rate which is the
proportion of cable customers that might be signed up to PATV in a
"base" market in a given quarter. This base signup rate is then
"corrected" by a market response factor which reflects the fact that
some markets are expected to respond better to PATV than others. The
result is an estimate of the number of households subscribing to PATV.
When this is multiplied by the price charged for the service the result
is the total revenue from PATV by CMA for a given quarter.

Derivation of the Market Response Parameters

Exhibit 2 provided an overview of how the Market Response Module
works. At this point we will discuss each step in the module in
greater detail.

EXHIBIT 2

PATV MARKET RESPONSE MODULE
OPERATION FOR EACH QUARTER

1. | CMA CABLE-PASSED HOUSEHOLDS |

X

2. PERCENT OF HOUSEHOLDS CABLED

||

3. | CMA CABLED HOUSEHOLDS |

X

4. BASE PATV SIGNUP RATE

||

5. | BASE CMA PATV HOUSEHOLDS |

X

6. CMA MARKET RESPONSE FACTOR

||

7. | CMA ACTUAL PATV HOUSEHOLDS |

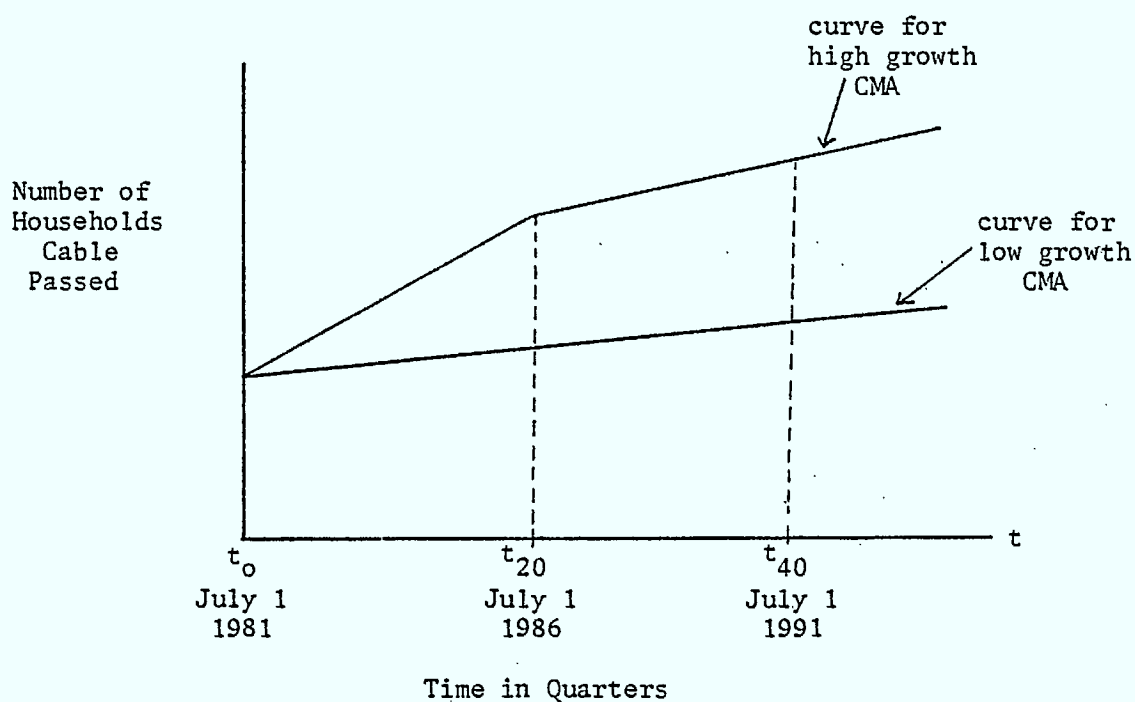X

8. PRICE PER QUARTER

||

9. | CMA REVENUE FOR THAT QUARTER |

CMA Cable Passed Households

A plot of the function which computes CMA cable passed households is seen in Exhibit 3.

EXHIBIT 3

PLOT OF THE CMA CABLE PASSED HOUSEHOLDS FUNCTION

curve for
high growth
CMA

Number of
Households
Cable
Passed

curve for
low growth
CMA

t_o t_{20} t_{40} t

July 1   July 1   July 1
1981   1986   1991

Time in Quarters

The number of cable passed households at the beginning of the run, t_o, was determined from data supplied by the Department of Communications. These numbers are seen in Exhibit 4.

Analysis of the available data revealed that over the past five years growth rates in cable-passed households had been extremely variable from one period to the next within a given CMA. This high variability was due primarily to changes in the size of license areas. To get a more reasonable estimate of how cable-passed households could be expected to grow in the future, the most recently available data on CMA population growth rates was obtained. It was assumed that the number of cable-passed households would grow for five years (20 quarters) at the past five years' population growth rate in each CMA. These growth rates are also seen in Exhibit 4.

An attempt is then made to have slow growth markets continue to grow at the same rate but have the growth rate in rapidly growing markets taper off. To accomplish this, at the end of 20 quarters the growth rate in those markets which have been growing at greater than one percent per year is lowered to one percent per year while the growth rate in those markets which have been growing at less than one percent per year is left at its previous rate. The two different types of growth curves are illustrated in Exhibit 3. The model is limited to a 40 quarter (10 year) time horizon.

Percent of Households Cabled

The function which computes the percent of households which are cabled is plotted in Exhibit 5. It is assumed that the percentage of households cabled will grow from its present level, PC_o, to some steady state level PC_{ss}. The initial and steady state percentages of households cabled vary by CMA as seen in Exhibit 4. For mature markets it was assumed that the steady state percentage of households cabled was five percent above the initial percentage of households cabled. For immature markets (those still being heavily cabled) it was assumed that the steady state percentage of households cabled would approach the percentage experienced by the average mature market of a similar type (such as rural versus urban).

It is assumed that in the absence of PATV the percentage of households cabled would gradually grow to the steady state level. This gradual growth rate is the parameter K1 and is set at 0.5 percent per quarter.

PATV is introduced for the first time at time t_p. In the subsequent quarters the percent of households cabled grows at an accelerated pace to reflect the impact of PATV. This accelerated growth rate is derived from a mathematical function seen in Exhibit 5. For present purposes it is sufficient to note that the speed with which the percent of households cabled approaches the steady state percentage can be varied by changing the K2 parameter shown in the exhibit.

EXHIBIT 4

INITIAL ESTIMATES OF SELECTED MARKET RESPONSE MODULE PARAMETERS

	CMA	Initial Cable Passed Households	Projected Growth Rate 1981-1986 in % per annum	Initial Percent of Households Cabled	Steady State Percent of Households Cabled
1	VANCOUVER	465947	0.3	89.9	98.0
2	VICTORIA	95940	1.1	90.0	98.0
3	REGIONAL B.C.	268793	1.7	84.0	92.0
4	EDMONTON	209198	2.4	62.8	69.0
5	CALGARY	209289	3.6	62.5	68.0
6	REGIONAL ALBERTA	96271	3.1	69.2	76.0
7	SASKATOON	54700	2.0	41.6	46.0
8	REGINA	53000	2.8	53.1	58.0
9	REGIONAL SASK.	34416	1.2	69.5	76.0
10	WINNIPEG	210088	0.7	83.8	92.0
11	REGIONAL MAN.	21970	0.1	51.7	57.0
12	TORONTO	1064272	0.7	75.1	82.0
13	HAMILTON	136663	0.5	79.7	87.0
14	LONDON	106857	0.6	87.7	96.0
15	OSHAWA	50067	1.5	67.1	73.0
16	KITCHENER	114500	1.3	78.7	86.0
17	ST. CATHARINES	85564	0.5	37.4	41.0
18	WINDSOR	0	0.0	0.0	0.0
19	SUDBURY	42000	0.0	66.1	72.0
20	THUNDER BAY	33743	0.6	88.7	97.0
21	OTTAWA/HULL-A	169071	2.3	76.7	84.0
22	OTTAWA/HULL-F	72459	1.9	76.7	84.0
23	REGIONAL ONT.	489337	0.9	80.2	88.0
24	MONTREAL-A	315697	0.2	36.8	40.0
25	MONTREAL-F	612823	0.2	36.8	40.0
26	QUEBEC-A	5019	1.0	49.2	54.0
27	QUEBEC-F	162308	1.0	49.2	54.0
28	CHICOUTIMI-A	1328	0.3	53.7	59.0
29	CHICOUTIMI-F	31674	0.3	53.7	59.0
30	REGIONAL QUEBEC-A	40872	0.3	71.9	79.0
31	REGIONAL QUEBEC-F	367854	0.3	71.9	79.0
32	HALIFAX	77253	0.6	74.0	81.0
33	REGIONAL N.S.	70427	0.7	75.1	82.0
34	ST JOHN, N.B.	30250	1.7	76.8	84.0
35	REGIONAL N.B.	76007	1.1	70.5	77.0
36	ST. JOHNS, NFLD.	30000	1.2	50.9	56.0
37	REGIONAL NFLD.	16894	1.0	72.7	79.0
38	REGIONAL P.E.I.	13481	1.2	85.5	93.0

EXHIBIT 4 CONTINUED

Market
Response
Factors

1.	VANCOUVER	1.1
2.	VICTORIA	1.0
3.	REGIONAL B.C.	0.9
4.	EDMONTON	1.1
5.	CALGARY	1.1
6.	REGIONAL ALBERTA	0.9
7.	SAKATOON	1.1
8.	REGINA	1.3
9.	REGIONAL SASK.	0.9
10.	WINNIPEG	1.0
11.	REGIONAL MAN.	0.9
12.	TORONTO	1.2
13.	HAMILTON	1.0
14.	LONDON	1.0
15.	OSHAWA	1.1
16.	KITCHENER	0.9
17.	ST. CATHERINES	1.0
18.	WINDSOR	0.0
19.	SUDBURY	0.9
20.	THUNDER BAY	0.9
21.	OTTAWA HULL-A	1.2
22.	OTTAWA HULL-F	1.3
23.	REGIONAL ONTARIO	0.9
24.	MONTREAL-A	1.1
25.	MONTREAL-F	1.2
26.	QUEBEC-A	1.1
27.	QUEBEC-F	1.2
28.	CHICOUTIMI-A	1.0
29.	CHICOUTIMI-F	1.1
30.	REGIONAL QUEBEC-A	0.9
31.	REGIONAL QUEBEC-F	0.9
32.	HALIFAX	1.0
33.	REGIONAL N.S.	0.9
34.	ST. JOHN N.B.	0.9
35.	REGIONAL N.B.	0.9
36.	ST. JOHNS, NFLD.	1.0
37.	REGIONAL NFLD.	0.9
38.	REGIONAL P.E.I.	0.9

EXHIBIT 5

PLOT OF THE PERCENT HOUSEHOLDS CABLED FUNCTION

Time (Quarters)
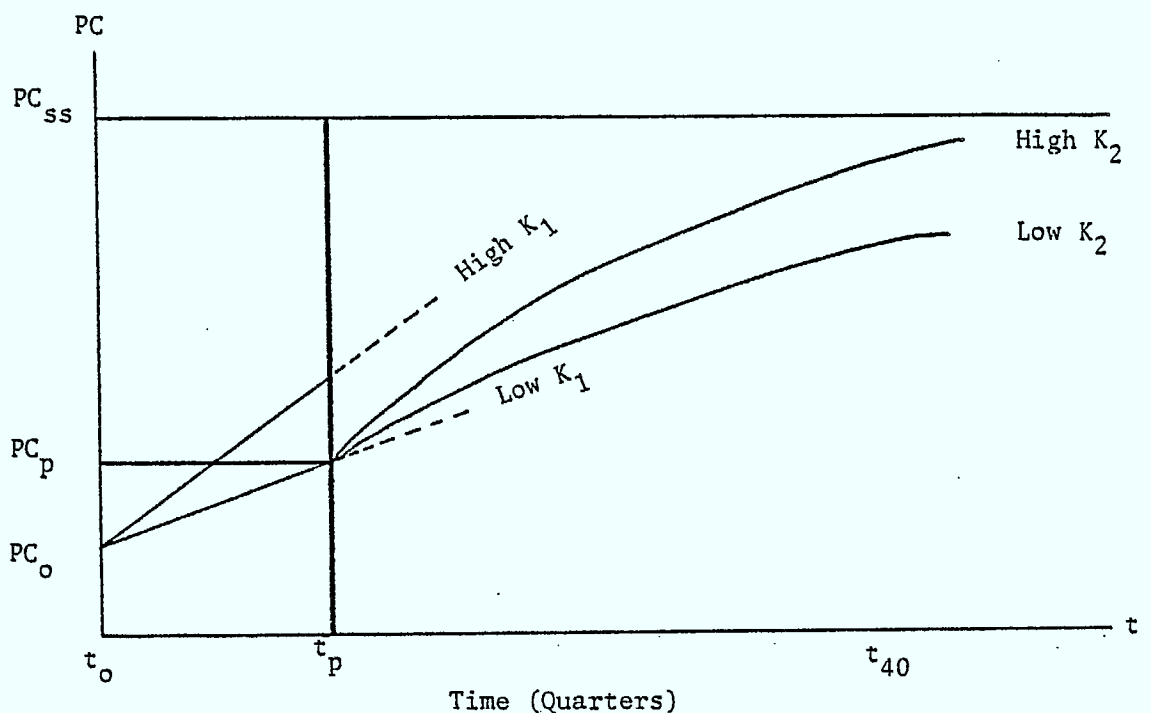
Definition of Terms:

t_o = Network startup quarter

t_p = Quarter of PATV market entry for a particular CMA. If for example a CMA gets PATV service at t=2, subscriber fees (revenue) are collected at the end of that quarter or at t=3.

PC_o = Estimate of percent of households cabled when the network starts.

PC_p = Percent of households cabled when PATV enters a particular CMA.

PC_{ss} = Percent of households cabled at steady state for a particular CMA.

Functions

$$PC_t = PC_o(1+K1)^t \qquad t_o \le t_i \le t_p$$

$$PC_t = PC_{ss} - \frac{PC_{ss} - PC_p}{t(t - t_p)K2} \qquad t_p < t_i \le t_{40}$$

Parameters

K1 and K2 are constant across all CMA's

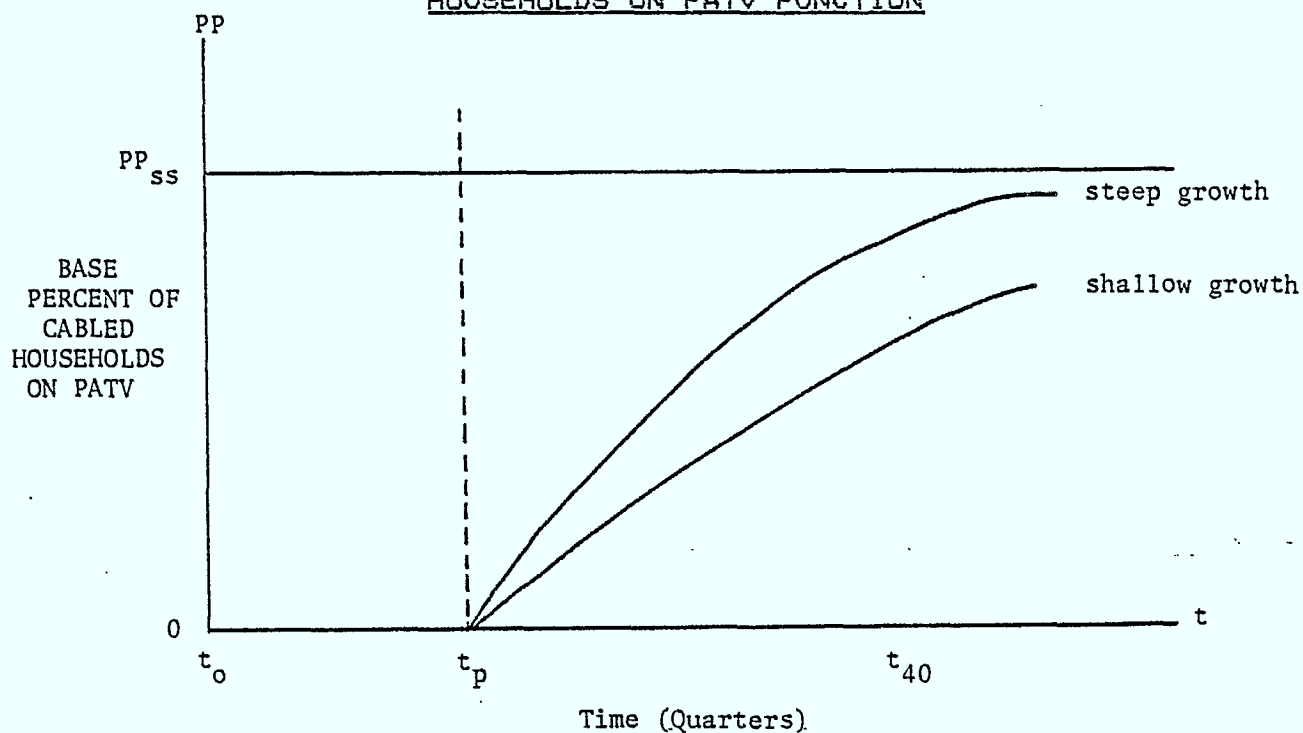## Base Percent of Cabled Households on PATV

As seen in Exhibit 6 it is assumed that the percent of cabled households subscribing to PATV starts at zero when PATV is introduced and grows to a steady state percentage (PPss). This steady state percentage is a base rate in the sense that its value is constant across all CMA's for a given price/content scenario. As we shall see later this base rate is varied for different price/content scenarios to reflect the relative desirability of the package being offered to consumer households.

As time passes the percent of cabled households subscribing to PATV can be made to increase rapidly or slowly as seen in Exhibit 6. This is accomplished through the use of four parameters K3, K4, K5 and K6. The shape chosen for this curve for current runs of the model are based on experience with the introduction of PATV into the American market. It was done by simply observing the percent of cabled households subscribing to PATV in widely different markets for different periods after market entry and creating a mathematical function which appeared to fit the data. The curve was not fit by any statistical curve fitting method.

CMA Market Response Factor

The base percent of cabled households which subscribe to PATV discussed in the preceeding section is corrected for each CMA using a market response factor. These market response factors, which typically take on values from 1.3 to 0.8, are intended to reflect the notion that some CMA's are expected to respond more strongly to PATV than the base percentage while other CMA's are expected to respond less strongly. The market response factors for all CMA's assuming the product is offered in the appropriate language are seen in Exhibit 4.

EXHIBIT 6

PLOT OF THE BASE PERCENT OF CABLED
HOUSEHOLDS ON PATV FUNCTION

Time (Quarters)

Definition of terms:

t_o = Network startup quarter
t_p = Quarter of PATV market entry
PP_{ss} = Long-run steady state percent of cabled households
that subscribe to PATV service

Functions

$$PP_t = 0 \qquad\qquad t_o \leq t_i \leq t_p$$

$$PP_t = PP_{ss} - \frac{PP_{ss}}{(t - t_p + 2)^Z} \qquad t_p < t_i \leq t_{40}$$

where

$$Z = \frac{K3}{t^{2.7}} + \frac{K4}{t^2} + t\,K5 + (t - t_p)\,K6$$

Parameters

K3, K4, K5 and K6 are constant across all CMA's

The market response factors are derived from an analysis of the following market characteristics:

1. Percentage of movie house capacity utilized

2. Rate of growth in (1)

3. Per capita recreation expenditures

4. Percentage change in (3)

5. Percentage of household color TV ownership

6. Per capita disposable income

These characteristics were chosen because they represented features of the CMA's that could logically be related to PATV penetration and because most of them were available on a CMA basis.

The procedure used was to break the CMA's into five groups based on the preceeding characteristics. The lowest response markets were assigned a value of 0.8 and the highest response markets were assigned a value of 1.2. The three categories in between were assigned values of 0.9, 1.0 and 1.1. These initial market response factors were then modified slightly (by adding or subtracting 0.1) to reflect the degree of cable penetration in the market and other unique market factors. The market response factors in Phase IV differ from those in Phase III primarily due to the more recent and more detailed data available for Phase IV.

IV.   OPERATION OF THE FINANCIAL MODULE

OVERVIEW

The financial module produces income statements for each CMA or any group of CMA's by quarter or for any specified series of quarters. It also produces a network income statement and balance sheet by quarter or for a series of quarters. In addition this module produces an internal rate of return for the network.

Data on revenues from consumers per quarter per CMA are generated by the marketing module and are fed into the financial module. The financial module then computes the costs of delivering the product described in the particular scenario being run. A distinction is made between costs incurred at the CMA level and costs incurred by the national distributor (network). The cost assumptions used for initial simulation runs have all been provided by DOC.

EXHIBIT 7

TYPICAL CMA INCOME STATEMENT

```
        CMA:   TORONTO
                 INCOME STATEMENT
                 STARTING 1    ENDING 40

REVENUE
   SUBSCRIBER REVENUE          x x x
   SIGN-UP REVENUE             x x x          x x x
LESS CMA OPERATING EXPENSES
   SIGN-UP EXPENSE             x x x
   EXHIBITION EXPENSE          x x x          x x x


CONTRIBUTION TO THE N. E. T.                  x x x
```

CMA Revenues

The revenues from consumers are of two types, a signup fee and a subscription fee. The signup fee is used to pay for the cost of installation of the descrambling device. It is currently assumed to be a one time charge of $10 for each new customer but may be varied with each run of the model. The fee per quarter must be input to the model and as we shall see later is based on the particular price/content scenario being simulated. Derivation of the estimated number of subscribers per CMA occurs in the market response module discussed in Section III.

Source of Revenues

Depending on the scenario assumed the consumer is presumed to watch some mix of the Canadian and foreign films and special events offered. Although in Section III it was noted that the mix offered to consumers of these three products could affect the number of subscribers to PATV, the model has no way of determining how many viewers are watching any of the specific products offered. This differs from pay per program PATV where the network knows exactly how much revenue is being generated by each event.

Sign Up Expense

It is assumed that all revenues from sign up fees are simply paid to the cable company that installs the descrambling device. Consequently, if the revenue item called "signup revenue" is changed in the model, the "signup expense" item automatically changes as well.

Exhibition Expense

The cable company is paid a fee which is intended to cover the costs of local marketing, billing and all hardware necessary to deliver the signal to its subscribers. This fee, which is constant across all CMA's but which may be varied from run to run, is some proportion of total subscription revenue. Currently it is assumed that the cable company receives 40 percent of the subscription fee. Thus for example if the subscription fee is $30 per quarter the cable company will receive (.40) x ($30) or $12 per quarter per subscriber. The 40 percent split to the cable companies is based on a submission by one of the proposed cable network operators.

NETWORK REVENUES AND COSTS

Organization of The Network

The national network acts as a conduit of product from producers to cable company head ends. It is assumed that the national network has a rented office in Toronto to handle English language programming and one in Montreal to handle French lanaguage programming. These locations were chosen somewhat arbitrarily but some location had to be assumed in order to assess the likely cost of uplink facilities. Each office has access to its own playback, and uplink facilities. The network is assumed to purchase furnishings and video equipment but for the purposes of this report the network does not own the sending station and does not own a studio which could be used for live program origination. Network staff negotiates with suppliers of product, produces the TV guide which is in turn mailed out by local cable companies, initiates the program signals to the satellite, and performs its own accounting and general management functions.

The sequence of market entry currently assumed is seen in Exhibit 8.

EXHIBIT 9

UNFOLDING OF THE MARKET AND THE NETWORK

Beginning of Quarter	Time Value In Model (t)	Activity
1	0	—Head office is set up —Negotiations with producers begins —Regional office set up
2	1	—Some local marketing begins
3 (Jan 1, 1982)	2	—PATV begins in all markets —Network staff expanded
4	3	—First cash flows from subscribers arrive
3-40	2-40	—All markets build toward steady state viewership

During the first two quarters the Toronto and Montreal offices are set up, contracts are signed for the acquisition of rights to broadcast films and live events and the network markets its service to the local cable companies. At the local level cable companies begin to advertise the service and install descramblers. At the beginning of the third quarter, January 1, 1982 PATV is offered to all of Canada simultaneously. The first cash flows begin to arrive one quarter later. The model runs for a total of 40 quarters from the time that the network is first created.

Network Income Statement

The model will produce a network income statement which includes data from any CMA or group of CMA's and for any time period up to 40 periods. A sample network income statement is seen in Exhibit 9.

Network Revenues

In all liklihood the local cable companies would be responsible for collecting installation and monthly subscription fees and remitting only the network share to the network. However for ease of presentation we have chosen to show all signup fees and subscription fees as revenue to the network.

The proportion of subscriber fees remitted to the network may be varied. The initial assumed proportion is 60 percent. Thus if subscription fees are $30 per quarter the network receives $18 per quarter.

Payments to Producers

Producers receive a proportion of the network's share of subscription revenue. This proportion may be varied in the model. The initial proportion of network revenues given to producers is 40 percent. Thus for example if the network receives $18 per quarter per subscriber the producers receive $7.20 of that amount per quarter.

The model subdivides the producer fees among Canadian film producers, foreign film producers and special event producers. The proportions going to each of these sources of programming can and should be varied depending on the number and type of new events or films included in the scenario being run.

EXHIBIT 9

TYPICAL NETWORK INCOME STATEMENT

	INCOME STATEMENT	
	STARTING 1	ENDING 40
SUBSCRIBER FEES		XXX
LESS PAYMENTS TO PRODUCERS		
CANADIAN FILM PRODUCERS FEES	XXX	
NON-CANADIAN FILM PRODUCER FEES	XXX	
LIVE EVENT PRODUCERS FEES	XXX	XXX
GROSS MARGIN		XXX
SIGN-UP REVENUE		XXX
AVAILABLE TO EXHIBITORS AND NETWORK		XXX
LESS EXHIBITORS EXPENSES		
SIGN-UP EXPENSES	XXX	
EXHIBITION EXPENSE	XXX	XXX
AVAILABLE TO NETWORK		XXX
NEGOTIATION STAFF	XXX	
NEGOTIATION CHIEF	XXX	
TV GUIDE STAFF	XXX	
TV GUIDE CHIEF	XXX	
PLAYBACK STAFF	XXX	
PLAYBACK CHIEF	XXX	
LEGAL COUNSEL	XXX	
TRAVEL	XXX	
OFFICE SPACE	XXX	
SECTY AND SUPPORT STAFF	XXX	
INTL ACCT STAFF	XXX	
INTL ACCT CHIEF	XXX	
SATELLITE RENTAL	XXX	
SENDUP CHARGES	XXX	
MICROWAVE	XXX	
DEPRECIATION	XXX	XXX
NET INCOME BEFORE TAX		XXX

We have assumed that each live event supplier receives one half of the money received by each film supplier. Canadian and foreign film suppliers are paid an equal amount per film. Thus, for example, if in a quarter there are 3 new Canadian films, 12 new foreign films and 12 new live events the 'producers' share of network revenue would be divided up as follows;

> Canadian films 3/21 of producer revenues,
> foreign films 12/21 of producer revenues, and
> live events 6/21 of producer revenues.

Another feature of the model is that it allows the producers to demand some minimum fee for use of the film or live event. Thus the producer receives a guaranteed minimum dollar amount at the time of delivery of the new film or live event or a percentage of revenue whichever is larger. Initial runs assume that a minimum of $300,000 per new movie per quarter is paid to Canadian producers only. The model permits the user the opportunity to have different minimums for Canadian films, foreign films and live events.
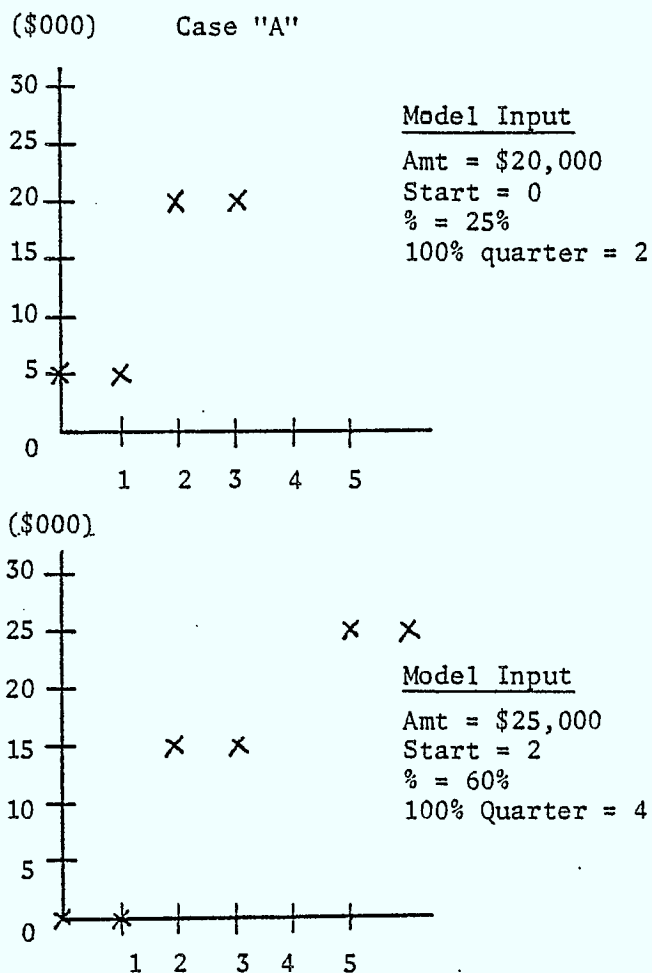
Signup Revenue and Signup Expense

As discussed earlier although signup revenues (initially assumed to be $10 per new subscriber) appear in the network income statement as "signup revenue" the model also deducts an equivalent amount as "sign up expense" on the presumption that this fee is paid to the cable companies.

Exhibition Expense

As discussed earlier exhibitors receive a proportion of subscriber fees. Initial model runs assume this proportion to be 40 percent but it may be varied.

Network Cost Behavior

Network costs reflect the underlying assumptions regarding the unfolding of the market. They are all fixed per quarter but the model allows each cost to be increased in two distinct steps as seen in Exhibit 10.

EXHIBIT 10

Illustration of Network Cost Behavior

($000)   Case "A"

```
30 ┼
25 ┼                          Model Input
                              ─────────────
20 ┼     X    X               Amt = $20,000
                              Start = 0
15 ┼                          % = 25%
                              100% quarter = 2
10 ┼

 5 ✳  X

 0 ┼──┼──┼──┼──┼──
    1  2  3  4  5
```

($000)

```
30 ┼
25 ┼                  X    X

20 ┼                          Model Input
                              ─────────────
15 ┼     X    X               Amt = $25,000
                              Start = 2
10 ┼                          % = 60%
                              100% Quarter = 4
 5 ┼

 0 ✳──✳──┼──┼──┼──
    1  2  3  4  5
```

    In Case A costs begin at $5,000 per quarter for two quarters then
rise to $20,000 per quarter for all remaining quarters. In Case B
costs begin at $0 for 2 quarters, rise to $15,000 for the next two
quarters and rise finally to $25,000 for all remaining quarters. No
allowance for inflation is made in any costs.

    The assumed costs of operating the network except for satellite
rental, sendup charges, microwave charges and depreciation are seen in
Exhibit 11.

EXHIBIT 11
Assumed Network Operating Cost Behavior

A. Toronto Office Costs   100%

		Amount	Start	Proportion	Quarter
1.	Negotiation Staff	18,000	0	1.00	0
2.	Negotiation Chief	9,000	0	1.00	0
3.	TV Guide Staff	10,000	0	1.00	0
4.	TV Guide Chief	7,500	0	1.00	0
5.	Playback Staff	13,000	0	0.50	2
6.	Playback Chief	7,000	0	1.00	0
7.	Legal Counsel	15,000	0	1.00	0
8.	Travel	45,000	0	1.00	0
9.	Office Space	40,000	0	1.00	0
10.	Secty and Support Staff	20,000	0	0.50	2
11.	Accounting Staff	9,000	0	0.50	2
12.	Accounting Chief	7,500	0	0.50	2

B. Montreal Office Costs   100%

		Amount	Start	Proportion	Quarter
1.	Negotiation Staff	12,000	0	1.00	0
2.	Negotiation Chief	9,000	0	1.00	0
3.	TV Guide Staff	10,000	0	1.00	0
4.	TV Guide Chief	7,500	0	1.00	0
5.	Playback Staff	13,000	0	0.50	2
6.	Playback Chief	7,000	0	1.00	0
7.	Legal Counsel	15,000	0	1.00	0
8.	Travel	30,000	0	1.00	0
9.	Office Space	40,000	0	1.00	0
10.	Secty and Support Staff	20,000	0	0.50	2
11.	Accounting Staff	9,000	0	0.50	2
12.	Accounting Chief	7,500	0	0.50	2

C. Combined Toronto and Montreal Office Costs   100%

		Amount	Start	Proportion	Quarter
1.	Negotiation Staff	30,000	0	1.00	0
2.	Negotiation Chief	18,000	0	1.00	0
3.	TV Guide Staff	20,000	0	1.00	0
4.	TV Guide Chief	15,000	0	1.00	0
5.	Playback Staff	26,000	0	0.50	2
6.	Playback Chief	14,000	0	1.00	0
7.	Legal Counsel	30,000	0	1.00	0
8.	Travel	75,000	0	1.00	0
9.	Office Space	80,000	0	1.00	0
10.	Secty and Support Staff	40,000	0	0.50	2
11.	Accounting Staff	18,000	0	0.50	2
12.	Accounting Chief	15,000	0	0.50	2

Uplink and Satellite Charges

It was assumed that the Toronto and Montreal playback facilities would be located near the antenna being used to send the signal to the satellite. Consequently, there is no cost built in to backhaul the signal from the playback facility to the uplink antenna.

The ANIK A satellite is used. This means that two transponders can be used to provide reasonable English language coverage across Canada's several time zones. Analysis of the distribution of French speaking persons in Canada suggests only a modest demand for this service west of Quebec. Consequently, we have assumed only one French language transponder which can cover all of Canada but over which the timing of programs is designed for the Quebec market. It is assumed that transponder rental costs $1.3 million per year per video channel for 24 hour service.

The uplink facility would have to be rented at an assumed cost of $120,000 per year per video channel in Toronto and a cost of $300,000 per year per video channel in Montreal. The higher cost in Montreal is incurred because a new uplink facility would have to be constructed.

Depreciation

It is assumed that the network initially acquires equipment valued at $500,000. This equipment is depreciated over 40 quarters on a straight line basis.

Taxes

No allowance for taxes is built into the model.

Network Balance Sheet

The network rents its premises, therefore the assets employed are primarily purchased equipment and accounts receivable. Purchased equipment is assumed to equal $500,000 while accounts receivable are equal to one month's revenues received from the subscribers. Early losses and all equipment purchases are assumed to be funded through borrowing. No interest cost has been built into the model. Notice that while this causes expected profit to be overstated it causes the return on equity investment to be understated. [1]

[1]. For example suppose a firm with profits before interest of $1,000 and total assets financed entirely by equity of $10,000. The return on equity is 10%. If this same firm had paid for half of its assets with debt borrowed at 8% the profit level would have been 1000 - (.08)(5000) = $600 but the return on equity would have been 600/5000 = 12%.

EXHIBIT 12

Sample Network Balance Sheet

N. E. T.
Balance Sheet
Period 20

ASSETS		LIABLITIES	
CASH	x x x	DEBT	x x x
ACCOUNTS RECEIVABLE	x x x		
EQUIPMENT (At Cost)	x x x		
LESS:			
ACCUMULATED DEPRECIATION	x x x		
NET EQUIPMENT	x x x	RETAINED SURPLUS	x x x
TOTAL ASSETS	x x x	TOTAL LIABILITIES	x x x

Internal Rate of Return [2]

The internal rate of return per quarter over 40 quarters of network operation is computed. This return is based strictly on cash inflows and outflows, not accounting profit. It should be stresed that the return generated by the model is compounded quarterly.

[2] The internal rate of return is sometimes called the discounted cash flow rate of return, or effective yield.

V. SIMULATION OF DIFFERENT PRICE/CONTENT SCENARIOS

OVERVIEW

The preceeding four sections outlined the operation of the PATV simulation model. This section is devoted to a discussion of several simulation runs conducted using the model.

Four distinct series of runs were conducted as outlined in Exhibit 13 below.

The first series of runs, called series A, simulated the reaction of Canadian consumers to an offering of exclusively foreign content. Although the output from this series of runs was not the primary objective of this project, it did serve as a sound benchmark against which to subsequently assess the impact of Canadian content. This series consisted of nine different simulation runs labelled one to nine.

The second series of runs, series B, considered the impact of the introduction of Canadian content. In this series it is assumed that all of Canada is offered a mix of foreign and Canadian features, all in the English language. This series includes four simulation runs, labeled ten to thirteen.

EXHIBIT 13

OVERVIEW OF THE FOUR SERIES OF
SIMULATION RUNS REPORTED IN THIS STUDY

SERIES	CONTENT	LANGUAGE	LOCATION	RUNS
A	Foreign only	English only	All Canada	1-9
B	Foreign and English Canadian	English only	All Canada	10-13
C	Foreign, English Canadian and French Canadian	English and French	All Canada	14-17
D	Foreign and French Canadian	French only	Quebec only	18-21

Series C, consisting of runs fourteen to seventeen, is the primary focus of this study. In this case it is assumed that all of Canada is offered foreign and English Canadian content in the English language and foreign and French Canadian content in the French language. This represents the most likely scenario for the introduction of PATV into this country.

The last series of runs, series D, consists of runs eighteen to twenty-one. This series is an attempt to assess the economic viability of a Quebec based network which broadcasts foreign and French Canadian content in the French language to a Quebec audience.

Series A

Series A assumes that a Toronto based network broadcasts exclusively foreign content via two satellite transponders to all of Canada in the English language. PATV subscribers are assumed to begin viewing during the second quarter after the network is created. Nine simulation runs were conducted using the price/content scenarios seen in Exhibit 14.

EXHIBIT 14

Overview of the Nine Simulation Runs
Making up Series A

		PROGRAM CONTENT		
		Low Profile (27 new/Q)	Moderate Profile (45 new/Q)	High Profile (72 new/Q)
	Low ($8/mo)	Run 1	Run 2	Run 3
PRICE	Moderate ($10/mo)	Run 4	Run 5	Run 6
	High ($12/mo)	Run 7	Run 8	Run 9

The three monthly subscription prices tested were $8, $10, and $12. The $8 price was tested for two reasons: (a) it is close to the price ($7.25 U.S.) for the HBO PATV offering in many U.S. markets (23). As such it provides a useful benchmark for the assessment of market response and (b) it represents the minimum price per month that has been considered by those advocating the introduction of PATV into Canada. The $10 price represents the current most likely price for PATV in Canada. For example it is consistent with the current plans of the proposed Pay Television Network (PTN) for the introduction of PATV (19). The $12 price is considered to be an upper bound for price with

suggetion by some that by the time PATV is introduced inflation plus the normal tendency of entrepreneurs to be profit maximizers may drive the price to $12 (21). The three different program contents are outlined in Exhibit 15.

EXHIBIT 15

Overview of the Three Different Content Profiles Assumed for Series A (Number of New Programs Offered Per Quarter)

	Low Profile	Moderate Profile	High Profile
Films	15	27	48
Special Events	12	18	24
Total	27	45	72

These content profiles assume that films and special events are offered several times each per quarter. However each quarter new films and special events are introduced. Thus our low profile has 27 new programs per quarter, the moderate profile 45 new programs and the high profile 72 new programs.

The high profile program content is based on that of Home Box Office (HBO) PATV offerings in the U.S. markets (2). Thus this content combined with the $9 per month price provides a very useful benchmark for all other simulation runs. The moderate and low profile program content were chosen to show the effect of varying content and reflect the type of content currently offered in some U.S. markets. It should be emphasized, however, that because of competition within markets by various networks offering different products and the trend to multiple tiering these content profiles are a substantial oversimplification of the product available in U.S. markets.

All simulation runs in this report assume the CMA cable passed households, initial percent of cable passed gouseholds and the steady state percent of cabled households discussed in section III and outlined in Exhibit 4.

The base steady state PATV signup rates (called PPss earlier) used for the nine runs are seen in Exhibit 16.

EXHIBIT 16

Values of Base Steady-State PATV Signup Rates
For Different Price/Content Scenarios

PROGRAM CONTENT

		Low Profile	Moderate Profile	High Profile
PRICE	Low	(1) 0.19	(2) 0.24	(3) 0.32
	Moderate	(4) 0.17	(5) 0.23	(6) 0.30
	High	(7) 0.16	(8) 0.22	(9) 0.28

The reference point for calculation of all the above base signup rate values was the scenario in cell 3. The high profile program content in this cell is approximately that of the HBO program offering in U.S. markets (23). The price of $8 per month is close to that charged by HBO in most U.S. markets, ($7.25), although there are variances between markets (23). The approximate average U.S. response to PATV under these circumstances is 50 percent (25), so this value has been used as an empirical "benchmark" for estimating cell 3.

In addition, a recent report of summary data for many U.S. PATV systems (26), reported an signup rate of 45 percent cabled households at an average monthly price of $8.98, which seems consistent with the HBO experience cited after adjusting for price. In addition to this evidence, an earlier report (24) cited considerable evidence on a reasonable range of potential PATV response in Canadian markets. Recent evidence (3,6) suggests that one major variable may differentiate U.S. and Canadian response to the same price/content PATV scenario; that is the percentage of households cabled in a market. The approximate average cable penetration (as a percentage of total households) in the U.S. is 20 percent compared to about 50 percent in Canada. Evidence (3,6) indicates a negative relationship between cable penetration and PATV signup rate. One report estimates that, given the U.S. experience, the average Canadian market will experience a PATV signup rate of 29 percent of cabled households (6). This estimate takes no account of the richness of the program content or price.

Given all the above evidence, this report will assume that high profile program content offered at an $8 per month subscription price offered to the Canadian market will result in a base PATV signup rate of 32 percent of cabled households. This is of course before any adjustment for individual market response using the market response factors.

Using scenario 3 in Exhibit 16 as a benchmark, content sensitivity was estimated for the moderate profile and low profile program content. The estimate was based on the number of new movies presented per month, since most evidence suggests that market response to PATV is primarily based on the major movie content. The following approximation function was used;

$$PP_{ss} = 0.32 \times \left(\frac{\text{Number of Movies}}{48} \right)^{1/2}$$

Sensitivity of signup rate to price with constant content was calculated using an estimate of price of demand for PATV(3). The price elasticity used was -0.3.

The results of these price and content sensitivity adjustments was the base steady-state PATV signup rate values shown in Exhibit 16.

The final step in this run was modification of the market response factors (MRF) outlined in Section III. Since the program content offered in these scenarios is all English language, the Francophone markets' response would be limited to the bilingual segment. The Market Response Factors for the Francophone market were thus reduced to 20 percent of the value they would have had with French language program content since it was assumed that 20 percent of the Francophone markets are bilingual (21).

The results from the series A simulation are shown in Exhibit 17. Notice that all nine simulations are very profitable.

EXHIBIT 17

Summary of the Economic Impact of
Series A Scenarios
($000,000)

	$8 PRICE			$10 PRICE			$12 PRICE		
	1	2	3	4	5	6	7	8	9
I. Total Subscriber Fees (all 40 quarters)	730.8	1056.0	1448.9	648.1	918.9	1312.2	552.2	849.8	1184.9
II. Payments to Exhibitors (all 40 quarters)									
Signup Expenses	7.9	10.4	13.9	7.2	9.9	13.0	6.7	9.4	12.1
Exhibition Expenses	292.3	422.4	579.5	259.2	392.8	524.8	220.9	339.9	473.9
III. Payments to Producers (all 40 quarters)									
Canadian	0	0	0	0	0	0	0	0	0
Foreign	126.3	190.0	278.2	111.9	176.9	251.9	95.4	152.9	227.5
Special Events	49.1	63.4	69.5	43.5	58.9	62.9	37.1	50.9	56.8
Total	175.4	253.4	347.7	155.6	235.7	314.9	132.5	203.9	284.4
IV. Other Network Costs (all 40 quarters)									
Satellite Rental	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7	24.7
Sendup Charges	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
All other	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Total	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5
V. Selected Income Statement Data (all 40 quarters)									
Total Net Income	227.6	344.7	486.1	197.8	318.0	436.9	163.3	270.4	391.1
Net Cash Inflow	207.2	321.6	459.5	177.9	295.4	411.2	143.9	248.4	336.3
VI. Timing of Profits and Losses									
Maximum Loss in a Quarter	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)
Quarter in Which Maximum Occurs	3	3	3	3	3	3	3	3	3
Quarters that are Profitable	4	4	4	4	4	4	6	4	4
VII. Timing of Financing									
Maximum Borrowing Required	2.5	2.3	2.0	2.6	2.4	2.3	3.0	2.5	2.4
Quarter in Which Maximum Occurs	4	4	4	4	4	4	6	4	4
Quarter in Which Debt is Completely Repaid	7	5	5	8	5	5	10	7	5
VIII. Time Adjusted Rate of Return (Percent Per Quarter)	46.9	78.7	>100	36.9	67.6	84.1	26.6	46.4	73.1

Series B

The purpose of the series B runs was to assess the impact of Canadian content on PATV viewership. In order to do this it was decided to hold price and the number of programs constant and to vary the proportion of Canadian films and live events offered. The price chosen was $10 per month and the number of programs was 45. Thus the comparable run from series A used as a starting point for Canadian content analysis was run 5 which assumed the offering of 27 films and 18 special events. This was referred to earlier as the moderate content profile.

The moderate content profile was used as a starting point for analysis because (a) it was felt that it represented the most likely short-term Canadian PATV offering and b) with 50 percent Canadian content, this program content would require 14 new Canadian films per quarter, or 56 per year. Any total program content requiring more than this could be difficult to meet in the short run. In 1978, only 28 English feature films were produced in Canada(1), and approximately 30 were forecast for 1979(4), so that even the above requirement for Canadian film content may not be easy to meet.

The four levels of Canadian content in Exhibit 18 were simulated.

EXHIBIT 18

Composition of the Content Simulated (in Terms of Number of Programs) In Runs Ten to Thirteen

Content	Run 10	Run 11	Run 12	Run 13
Foreign films	27	24	19	14
Canadian films	0	3	8	13
Foreign Events	18	16	12	9
Canadian Events	0	2	6	9
Total Programs	45	45	45	45
Percent Canadian	0%	10%	30%	50%

For these four runs the steady state PATV signup rates (PPss) were adjusted downward from the level used in run 5 of series A to reflect the impact of increasing Canadian content while at the same time lowering foreign content. The new values of the steady state signup rates are seen in Exhibit 19.

EXHIBIT 19

Steady State PATV Signup Rates
For Various Levels of Canadian Content

	Run 10	Run 11	Run 12	Run 13
Percent Canadian Content	0	0.10	0.30	0.50
Steady State PATV Signup Rate	0.23	0.22	0.19	0.15

The estimates in Exhibit 18 are derived from the following function:

$$PP_{ss} = 0.23(\text{Percent foreign film}) + 0.23(\text{Percent Canadian film})(26/74)$$

This function is based on a variety of evidence.

The prime mover of PATV acceptance is widely regarded to be major film offerings. As U.S. major films are replaced by Canadian films, the response is expected to decline proportionally by the ratio (26/74). This ratio reflects data on the relative TV viewing (percentage of audience viewing time) between U.S. major films and Canadian films (1).

It must be acknowledged that this analogy is an imperfect one, since viewing preferences do not reflect the same consumer choice as whether or not to subscribe to PATV.

The above function reflects evidence that response to Canadian films is lower in general than U.S. films in Canadian audience viewing behavior.

One source comments that Canadian programs are watched most heavily for news and sports, and foreign (U.S.) programs for light entertainment, a category that includes major movies. In the Toronto market, for example feature films represent about 23 percent of TV viewing time (7). In addition, the viewing share for Canadian light entertainment was 11 percent compared to about 89 percent for U.S. light entertainment, most of the difference being accounted for by movies. Another source (8) notes that in prime time, the viewing share of Canadian programs (all types) is about 30 percent. This report also notes "Canadian programs are generally produced to fulfill the legal requirements of Canadian content, and, in general have lesser appeal than the U.S. programs". This report also noted that during daytime TV viewing hours, 23 Canadian feature films had an audience share of 0.01 percent, almost nil. The report states "if Canadian prime time programs compete poorly against U.S. prime time programs (as is the case), the performance of Canadian daytime programs (against U.S.

daytime programs) is even worse". The report cites the main reason for this is that Canadian news and current affairs programs compete fairly well and these are found more in prime time than in the daytime periods.

A table from our report (8) is useful in highlighting the differences in response to U.S. and Canadian entertainment offerings. These data apply to English language TV stations.

Percentage of Audience Viewing Time

	Daytime		Prime Time	
	Canadian	Foreign	Canadian	Foreign
Entertainment	7.95	70.14	8.72	66.18
Sports	10.68	2.32	5.47	1.14

The entertainment category here involves both feature films and shorter shows. The difference in viewings for Canadian content is dramatically lower. One report (10) amplifies this by stating "the attraction of foreign (mostly U.S.) content is highest in the entertainment category, which is primarily movies". The report further states that the "share of audience" for Canadian programming is declining rapidly.

It seems reasonable to conclude the percentage of Canadian content in a PATV offering in Canada will have a negative impact on the signup rate for PATV. This conclusion is really based on a notion of a pure Canadian feature movie, that is with all people involved in the movie primary residents of Canada and with the great majority of their work done in Canada. The function used to estimate the impact of Canadian content assumes this type of feature film.

The market response factors for this run were the same as those used in series A since they represent the same conditions with respect to relative market response between markets offered the same scenario.

The results from simulation series B are seen in Exhibit 20. The introduction of greater Candian content lowers returns to the point where the before tax quarterly ROI is 7.8 percent. If this is approximately 3.9 percent quarterly after tax then 50 percent English Canadian content appears marginally achieveable given all cost assumptions.

EXHIBIT 20

Summary of the Economic Impact of
Series B Simulations
($000,000)

		10	11	12	13
I.	Total Subscriber Fees (all 40 quarters)	981.9	918.4	773.2	579.4
II.	Payments to Exhibitors (all 40 quarters)				
	Signup Expenses	9.9	9.5	8.2	6.4
	Exhibition Expenses	392.9	367.4	309.3	231.7
III.	Payments to Producers (all 40 quarters)				
	Canadian	0	33.3	104.6	144.3
	Foreign	176.8	147.7	40.8	51.4
	Special Events	58.9	55.1	46.4	34.7
	Total	235.7	236.1	191.7	230.5
IV.	Other Network Costs (all 40 quarters)				
	Satellite Rental	24.7	24.7	24.7	24.7
	Uplink Charges	2.3	2.3	2.3	2.3
	All Other	8.5	8.5	8.5	8.5
	Total	35.5	35.5	35.5	35.5
V.	Selected Income Statement Data (all 40 quarters)				
	Total Net Income	318.0	279.5	236.7	91.6
	Net Cash Inflow	295.4	257.3	215.9	62.6
VI.	Timing of Profits and Losses				
	Maximum Loss in a Quarter	(0.9)	(0.9)	(0.9)	(3.3)
	Quarter in Which Maximum Occurs	3	3	3	4
	Quarters that are Profitable	4	4	5	10
VII.	Timing of Financing				
	Maximum Borrowing Required	2.4	3.2	4.7	17.2
	Quarter in Which Maximum Occurs	4	4	5	10
	Quarter in Which Debt is Completely Repaid	5	7	8	21
VIII.	Time Adjusted Rate of Return (Percent Per Quarter)	67.6	50.1	35.3	7.9

Series C

Series C was designed to simulate the price/content scenarios that were most likely to be offered to Canadians. In this series of runs one channel was assumed broadcast all over Canada in the English language while another channel would broadcast all over Canada in the French language. The specific runs done varied the amount of Canadian content on each channel, however on the anglophone channel the Canadian content was English language productions while on the francophone channel the Canadian content was French language productions.

The assumed levels of Canadian content for the runs are as seen in Exhibit 21. This exhibit also points out the steady state PATV signup rates which are assumed.

EXHIBIT 21

Key Assumptions For Runs
Fourteen to Seventeen

	Run 14	Run 15	Run 16	Run 17
Foreign films	27	24	16	14
Canadian films	0	3	8	13
Foreign Events	18	16	12	9
Canadian Events	0	2	6	9
Total Programs	45	45	45	45
Percent Canadian	0%	10%	30%	50%
Steady State PATV Signup Rate	0.23	0.22	0.19	0.15

These runs differ from the runs in Series B in that the market response factors for all francophone markets are at their normal levels outlined in Exhibit 4. Recall that in Series B the francophone market response factors were only 20 percent of their normal level due to the lack of French language programming. From a cost standpoint Series C also differs from Series B because the number of Canadian programs produced doubles to reflect a duplication of content requirements in the francophone and anglophone markets. Also the introduction of a francophone channel requires a complete Montreal based regional office, uplink facilities and an additional transponder.

The results from simulation Series C are seen in Exhibit 22. The most noticeable feature of these results is that given the cost assumptions Candian content of somewhere between 30 and 50 percent in both francophone and anglophone markets seems viable.

EXHIBIT 22

Summary of the Economic Impact
of Series C Simulations
($000,000)

		14	15	16	17
I.	Total Subscriber Fees (all 40 quarters)	1129.0	1055.9	888.9	666.1
II.	Payments to Exhibitors (all 40 quarters)				
	Signup Expenses	11.4	10.9	9.4	7.3
	Exhibition Expenses	451.6	422.4	355.6	266.4
III.	Payments to Producers (all 40 quarters)				
	Canadian	0	66.6	177.6	288.6
	Foreign	203.2	157.1	91.7	46.4
	Special Events	67.7	58.3	44.8	28.8
	Total	270.9	282.0	314.1	363.7
IV.	Other Network Costs (all 40 quarters)				
	Satellite Rental	37.0	37.0	37.0	37.0
	Uplink Charges	5.1	5.1	5.1	5.1
	All Other	16.2	16.2	16.2	16.2
	Total	58.3	58.3	58.3	58.3
V.	Selected Income Statement Data (all 40 quarters)				
	Total Net Income	348.1	293.2	160.9	(22.4)
	Net Cash Inflow	324.0	269.7	138.9	0
VI.	Timing of Profits and Losses				
	Maximum Loss in a Quarter	(1.5)	(1.5)	(3.4)	(7.4)
	Quarter in Which Maximum Occurs	3	3	4	4
	Quarters that are Profitable	4	4	8	20
VII.	Timing of Financing				
	Maximum Borrowing Required	4.3	5.9	15.3	56.4
	Quarter in Which Maximum Occurs	4	4	8	19
	Quarter in Which Debt is Completely Repaid	6	8	14	–
VIII.	Time Adjusted Rate of Return (Percent Per Quarter)	51.6	35.5	13.9	0

Series D

This series of runs was designed to simulate the operation of a single channel offered in French to the Quebec market. The four runs done are seen in Exhibit 23.

EXHIBIT 23

Key Assumptions For Runs
Eighteen to Twenty-One

	Run 18	Run 19	Run 20	Run 21
Foreign films	27	24	16	14
Canadian films	0	3	8	13
Foreign Events	18	16	12	9
Canadian Events	0	2	6	9
Total Programs	45	45	45	45
Percent French Canadian	0%	10%	30%	50%
Steady State PATV Signup Rate	0.23	0.22	0.21	0.19

In the exhibit the steady state PATV signup rate declines as the percent of French Canadian content increases. However this decline is not as great as the decline assumed when more English Canadian content is introduced into the anglophone markets. There is some evidence that francophone markets are more receptive to Quebec content material than anglophone markets are to Canadian content material.

The following table (5) illustrates some significant differences in anglophone and francophone TV viewing habits. These data represent percentage of audience viewing time.

Percentage of Audience Viewing Time

	English Stations		French Stations	
	Canadian	Foreign	Canadian	Foreign
News	11.3	1.2	10.1	—
Current affairs	4.2	0.2	5.2	0.2
Information	1.3	—	1.7	—
Sports	4.3	1.5	15.2	—
Entertainment	7.7	68.2	32.7	35.0
Other	0.1	—	—	—
	28.9	71.1	64.8	35.2

The table illustrates both the anglophone audience preference for foreign (U.S.) entertainment and the large difference in francophone audience interest in Candian content by comparison. A different source (8) notes that Candian programs obtain a much higher share of viewing time during prime time (54 percent) on French language channels than on English language channels (30 percent). An analysis of the French language TV audience in Montreal (7) showed 57 percent of viewing time is spent watching Canadian content compared to 26.4 percent in Toronto.

These data provide evidence to support the assumptions made above for the effect of PATV on the steady state signup rate in the francophone markets.

The values of the MRF for Quebec anglophone markets were reduced to 20 percent of their value with English language programming to reflect an assumption about the size of the bilingual anglophones who might respond to a French language PATV offering.

The results from simulation Series D are seen in Exhibit 24. The most noticeable feature of these results is that none of the French Canadian content scenarios run were economically viable given the cost assumptions in the model. It is important to emphasize once again that if costs can be reduced or if alternative revenue sharing arrangements with cable systems and producers could be worked out the system could possibly become viable.

EXHIBIT 24

Summary of the Economic Impact
of Series D Simulations
($000,000)

		18	19	20	21
I.	Total Subscriber Fees (all 40 quarters)	189.9	177.5	165.2	141.7
II.	Payments to Exhibitors (all 40 quarters)				
	Signup Expenses	1.9	1.8	1.7	1.5
	Exhibition Expenses	75.9	71.0	66.1	56.7
III.	Payments to Producers (all 40 quarters)				
	Canadian	0	33.3	98.8	144.3
	Foreign	34.2	28.5	21.0	13.3
	Special Events	11.4	10.6	9.9	8.5
	Total	45.6	72.5	119.7	166.0
IV.	Other Network Costs (all 40 quarters)				
	Satellite Rental	12.4	12.4	12.4	12.4
	Uplink Charges	2.8	2.8	2.8	2.8
	All Other	7.7	7.7	7.7	7.7
	Total	22.9	22.9	22.9	22.9
V.	Selected Income Statement Data (all 40 quarters)				
	Total Net Income	45.5	11.2	(43.5)	(103.9)
	Net Cash Inflow	30.9	0	0	0
VI.	Timing of Profits and Losses				
	Maximum Loss in a Quarter	(0.6)	(0.9)	(2.5)	(3.7)
	Quarter in Which Maximum Occurs	3	4	5	9
	Quarters that are Profitable	4	14	0	0
VII.	Timing of Financing				
	Maximum Borrowing Required	1.9	6.9	57.9	101.3
	Quarter in Which Maximum Occurs	4	14	40	40
	Quarter in Which Debt is Completely Repaid	10	–	–	–
VIII.	Time Adjusted Rate of Return (Percent Per Quarter)	19.9	0	0	0

VI.   CABLE COMPANY OPERATING ECONOMICS

A question that naturally arises from the preceding simulations is; would PATV be viable for all cable companies or just the larger cable companies? In order to address this question a model has been created which simulates the before tax internal rate of return for a hypothetical cable company.

Model Overview

In order to receive the signal the cable company would require a small dish with associated receiver and modulator. In addition he would want to scramble the signal sent out by the head end. The cost of these items can vary tremendously depending on buying power, the quality of signal desired and the degree of backup desired. For a small system we have assumed this cost to be $17,000, while for a larger system this cost may be $50,000.

The cable company may decide to install positive (descrambles signal) or negative (scrambles signal) trapping systems. We assume that some form of positive trapping device is installed in the home of each subscriber. As in previous analyses it is assumed that the installation cost of this trap is paid by the subscriber however the cable company must purchase the traps. The cost of the traps is likely to vary depending on volume of purchase, degree of security desired and the prevalence of brown boxes in the area. For these simulations we have assumed that small systems will pay $20 each for these traps while larger systems will pay $30 each.

Revenues are generated from the product offering of Run 16 (Series C). The market the cable company is operating in is an average one whose initial penetration of passed households is 70%. It will grow to 85% penetration and has a population growth of 1% per year. Its MRF is set at 1.0. Under this scenario the revenue split to the cable company is $12 per quarter. The cable company will have to undertake some marketing activities which will gradually taper off. We have assumed that marketing costs will be $1 per cable passed household in the first quarter, declining to $ .75 per passed household in the second quarter $ .50 per passed household in the third quarter and finally $ .25 per cable passed household from the fourth quarter on. In addition, printing, bad debt, billing and consumer relations, etc. expenses are assumed to be $ .50 per quarter per PATV subscriber. No other operating costs are assumed.

The model assumes an initial number of cable passed households such as 10,000. The market is allowed to unfold and the IRR is computed. The initial number of households is decreased and IRR is computed again. This process is repeated until some minimum IRR specified by the user is reached.

Simulation of Small Cable Company

The preceding model was run for a hypothetical small cable company with the cost and revenue assumptions seen in Exhibit 25.

EXHIBIT 25
Revenue and Cost Assumptions For Small
Cable Company Simulation Run

Price and Content Scenario	Run 16 (Series C)
Head end modification	$17,000
Trap costs	$20 per new PATV customer
Advertising cost	
Quarter 1	$1.00 per cable passed household/quarter
Quarter 2	$.75 per cable passed household/quarter
Quarter 3	$.50 per cable passed household/quarter
Quarters 4-40	$.25 per cable passed household/quarter
Variable operating costs	$.50 per PATV customer/quarter
Variable gross revenue	$12.00 per PATV customer/quarter
Minimum assumed IRR	5%

The number of initial cable subscribers that would provide a 5% per quarter IRR for a small cable company is approximately 900. To the best of our knowledge this includes about two thirds percent of all Canadian cable companies who have subscribers.

Using the cost configuration of a larger system seen in Exhibit 26 the beginning number of cable subscribers to obtain a return of 5% per quarter is approximately 3000. This represents about 40 percent of all cable companies who have subscribers.

It would appear that with 40 percent of revenue going to cable companies PATV will be very lucrative to large companies. When we ran the model assuming the costs in Exhibit 26 and 70,000 initial cable connected households we obtained a before tax return to the cable company of 19 percent compounded quarterly.

EXHIBIT 26
Revenue and Cost Assumptions For
Larger Cable Company Simulation Run

Price and Content Scenario	Run 16 (Series C)
Head-end modification	$50,000
Trap costs	$30 per new PATV customer
Advertising cost	
Quarter 1	$1.00 per cable passed household/quarter
Quarter 2	$ .75 per cable passed household/quarter
Quarter 3	$ .50 per cable passed household/quarter
Quarters 4-40	$ .25 per cable passed household/quarter
Variable Operating Costs	$ .50 per PATV customer/quarter
Variable Gross Revenue	$12.00 per PATV customer/quarter
Minimum Assumed IRR	5%

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