

DEPARTMENT OF COMMUNICATIONS

MSAT PHASE B

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# THE IMPACT OF MSAT ON THE RADIO COMMON CARRIER INDUSTRY

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JANUARY 1985

## EXECUTIVE SUMMARY

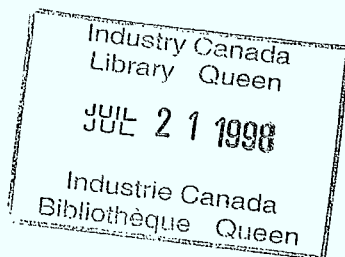
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**KVA**

KVA Communications  
and Electronics Co.

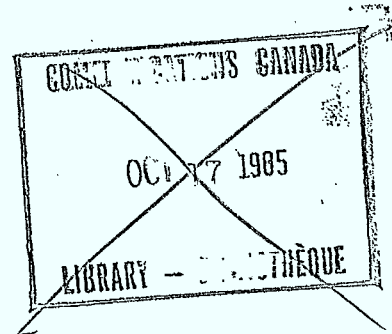
Radio Communications System Specialists

KVA Communications  
and Electronics Co.  
364 Supertest Rd.  
Downsview, Ontario M3J 2M2  
Tel. (416) 661-6644



June 5, 1985

Mr. John Braden  
Manager, MSAT Economic Studies  
Department of Communications  
300 Slater Street  
Ottawa, Ontario  
K1A 0C8



Dear John:

Re: Contract OSM83-00008  
Study to Assess the Impact of  
MSAT on Radio Common Carriers

The study team of KVA COMMUNICATIONS AND ELECTRONICS CO. in conjunction with WARD MALETTE CHARTERED ACCOUNTANTS is pleased to submit the final report for the "Study to Assess the Impact of MSAT on the Radio Common Carriers Industry."

The report is presented in 3 volumes;

Volume I - Main Report  
Volume II - Methodology and Attachments  
Volume III - Modelling Data

The study shows that MSAT represents a substantial opportunity for the Radio Common Carrier Industry in Canada. The significant benefits in employment and industry growth that could be realized, far exceed the investment risk of MSAT to the RCC's.

Through time, MSAT could represent a substantial portion of the RCC business. The study shows that in order for this significant impact to be realized, major regulatory, institutional and policy issues will have to be reviewed and decisions implemented that will ensure the RCCs can compete with other service providers on an equal basis.

KVA Communications and Electronics Co.

The findings of this study, in addition to the other industrial and social impact findings, emphasize in our opinion, the need for MSAT services in Canada and the commercial viability of the project.

Yours truly,  
KVA COMMUNICATIONS AND ELECTRONICS CO.



Mike Kedar  
Vice-President

MK/tlt  
encl.



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DEPARTMENT OF COMMUNICATIONS

MSAT PHASE B

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**THE IMPACT OF MSAT ON  
THE RADIO COMMON CARRIER INDUSTRY**

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JANUARY 1985

**EXECUTIVE SUMMARY**

FINAL REPORT

APRIL 1985

**KVA**

**KVA Communications  
and Electronics Co.**

Radio Communications System Specialists

IN COLLABORATION WITH: WARD MALLETTE CHARTERED ACCOUNTANTS



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Government of Canada  
Department of Communications

Gouvernement du Canada  
Ministère des Communications

Your file    Votre référence

Our file    Notre référence

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DOC CONTRACTOR REPORT

DOC-CR-85-022

DEPARTMENT OF COMMUNICATIONS - OTTAWA - CANADA

TECHNOLOGY AND INDUSTRY SECTOR

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TITLE: Study to Assess the Impact of MSAT on Radio Common Carriers

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DATE: April 1985

Canada

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## EXECUTIVE SUMMARY

### Introduction

This study provides an assessment of the economic impact of MSAT (Mobile Satellite) on the RCC's (Radio Common Carriers) industry. It was conducted as part of the overall socio-economic studies directed by the Department of Communication as the second part (Phase B) of the MSAT program.

The study shows that MSAT provides significant benefits to the RCC industry which far exceed the investment risk in becoming an RCC/MSAT service provider. These benefits, added to the other industrial and social benefits of the program, emphasize the commercial viability of the project for Canada.

### Study Objectives

The objectives of the study were:

- To assess the market opportunities that MSAT represents to the RCC industry, as well as the total MSAT market (Service Provider point of view);
- To review RCC industry development with and without MSAT;
- Identify the economic impacts and business opportunities and make recommendations as to the program evolution that could best accomodate RCCs as service providers.

In addition, the study investigated policy, institutional and regulatory issues, as well as reviewing some technical aspects such as interconnection to existing terrestrial systems, billing and collection arrangements and earth station network development.



## Study Methodology

The study began with a review of the RCC Industry based on DOC Licence Data dated December 1982, and through an industry survey questionnaire sent to 200 of approximately 600 RCCs. Participants were selected by size and provincial distribution. Of the 200 mailed questionnaires, 80 responses were received. Responses were summarized and analyzed to provide a description of the RCC Industry.

Following this, and prior to surveying the industry regarding MSAT, the major study assumptions were determined by DOC in cooperation with Telesat, Telecom Canada, KVA and others. These study assumptions were documented in a report prepared by DOC, entitled, "Socio-Economic Study Assumptions on Costs, Traffic and Service"1. Major study assumptions included such items as airtime usage, airtime costs, access costs, mobile and fixed equipment costs, amongst others.

Having established the major characteristics of the RCC Industry and the major MSAT study assumptions, the MSAT concept was presented through a mailed questionnaire to 30 RCCs from the 80 initial responses and was followed up with personal interviews at which time the questionnaire was completed.

The data collected was analyzed and aggregated to include the total RCC population from which the MSAT RCC industry market forecasts were derived.

The survey also provided important data on various policy and institutional issues of concern to the RCC's and was supplemented with input from the CRCCA working committee.

To determine the impact of MSAT on the RCC industry, a financial model was developed which used the pricing strategy developed as part of the study assumptions and the market forecasts as determined by the survey as its primary inputs. The model was particularly detailed and included all the costing components comprising the major activities needed to support MSAT service provisioning, such as: percentage of leased versus customer owned equipment, number of base stations and gateways by size, various charges associated with installation, repair, administration and billing, and airtime and access costs.

Based on the forecast, and major revenue, expense and capital items, the model calculated the incremental cash inflows and cash outflows and determined the Net Present Value (NPV) of the RCCs share of the MSAT program over the period 1989 - 2002 from which the economic feasibility of MSAT was determined from the RCCs point of view.

Finally, a number of financial model runs were produced and the results analyzed. The major results were selected for inclusion in the final report.

## Major Study Results

### RCC Industry Description

The Radio Common Carriers Industry is made up of about 600 small and large operators providing primarily unregulated public paging and mobile radio service throughout Canada. Over 75% of the RCCs are considered small, having less than 10 base stations in operation. RCCs are almost evenly distributed between rural and urban locations, where rural is considered to be anywhere outside the 23 MA's as defined by DOC.

Almost all paging service in Canada is provided on public systems through the RCC's. Mobile radio, on the other hand, primarily consists of private systems and users. The RCCs service a very small share of the total mobile radio market through public systems.

The RCC Industry currently provides approximately 85% of all paging services, approximately 12% of all mobile radio services and practically none of the mobile telephone service.

### Market Needs

The study identified particular communication needs of existing RCC subscribers that cannot effectively be met with today's technology but could be met with the introduction of MSAT, as well as new markets for RCCs.

Over 50% of the potential RCC MSAT market has been identified from the private user (holders of Radio Licenses) sector, which traditionally are not subscribers to RCC services.



The major MSAT market areas identified in this study include:

1. Dispatch services to intercity trucking companies;
2. Emergency situations involving natural disasters such as forest fires;
3. Data Aquisition and Control Systems for remote data collection of environmental conditions including weather and water levels;
4. Voice and data communication with remote and isolated exploration and mining camps including those that operate on a roaming basis;
5. Voice communication in the wilderness for trappers, hunters and fishers;
6. Law enforcement agencies in rural and remote areas;
7. True wide area paging through fixed link applications;
8. Mobile telephone service on public transport vehicles i.e. buses, trains and aircraft;
9. Wide area ability to interface with existing terrestrial data systems i.e. TWX/TELEX, packet switching etc.

#### Market Forecasts

RCC Industry MSAT market forecasts for Mobile Radio and Mobile Telephone Service are as follows:

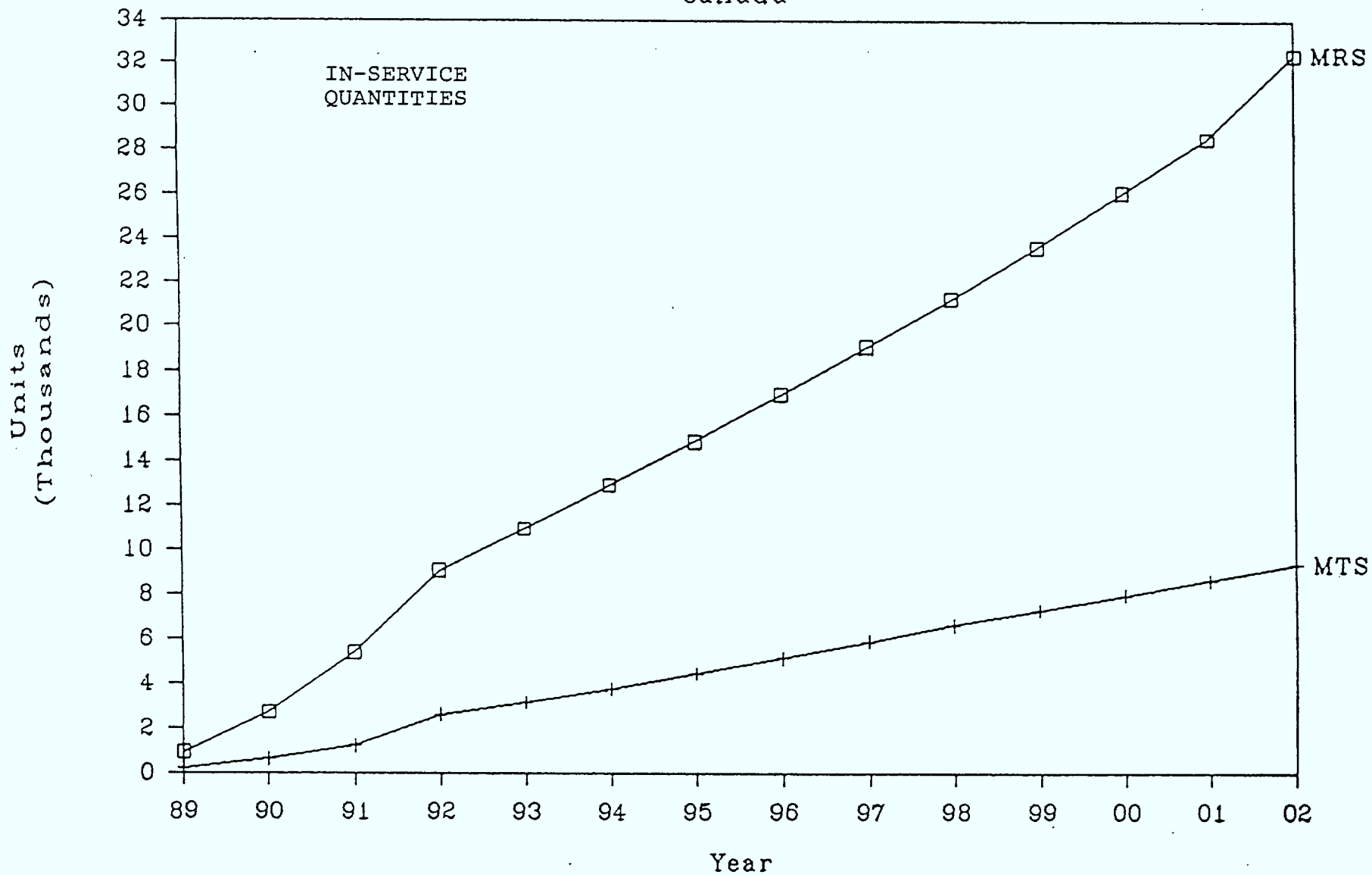
	Mobile Radio	Mobile Telephone	Total
Market Forecast for year 2002:	32,399	9,324	41,723

The market forecast was based on interviews with individual RCCs which were completed prior to the present level of conceptual design definition. Thus, many of the earlier study assumptions presented to the RCCs have changed. Further, at the time of the interviews, the official Woods Gordon/Telesat view of the total market was unavailable. It is our opinion that these factors contributed to a conservative estimate of the total market by the RCCs and to an RCC forecast share that is consequently understated.

The following graph illustrates the RCCs MSAT demand forecast projections by service type to the year 2002.

# MSAT RCC Forecast - MRS & MTS

Canada



MRS - MOBILE RADIO SERVICE

MTS - MOBILE TELEPHONE SERVICE



Major Cash Flow Components

Revenue

Revenues are comprised of a 25% markup on expenses, as well as a recovery component for capital investment, including fixed (i.e. base stations) and mobile terminal equipment rented to end users. Since the largest single contributor to revenue is end user airtime charges, any changes in the study assumptions such as:

- 1) forecasted units
- 2) markup on airtime
- 3) monthly airtime usage per mobile (traffic level).

will have a significant impact on the NPV calculation of the MSAT program.

The airtime usage assumption is important because of its potential impact on the cash flows. For the purposes of this study, 150 minutes/month/subscriber is the assumed airtime usage. Our own study results indicated a slightly lower airtime usage per month, however, the difference had minimum impact on the cash flows and was therefore considered unimportant.

Expenses

The largest expense items in order of significance are Telesat airtime costs, Telesat access costs and advertising/promotion and selling costs. Cumulatively they account for 92% of the estimated expenses to the year 2002. All expenses are recovered, primarily through a 25% markup of airtime and access costs. Advertising/promotion and selling costs account for approximately 7% of the cumulative expenses and approximately 6% of the cumulative revenue and as such are in line with current industry expenditures. These costs represent what the industry feels it must spend to successfully promote MSAT and to achieve

the projected forecasts.

All other expenses, such as: installation, repair, billing/collection costs, labour training and the cost of "non-revenue" earning inventory are recovered through a 25% markup. These expenses are also based on current industry standards and there is no reason to suggest that this would change with MSAT.

#### Capital Investment

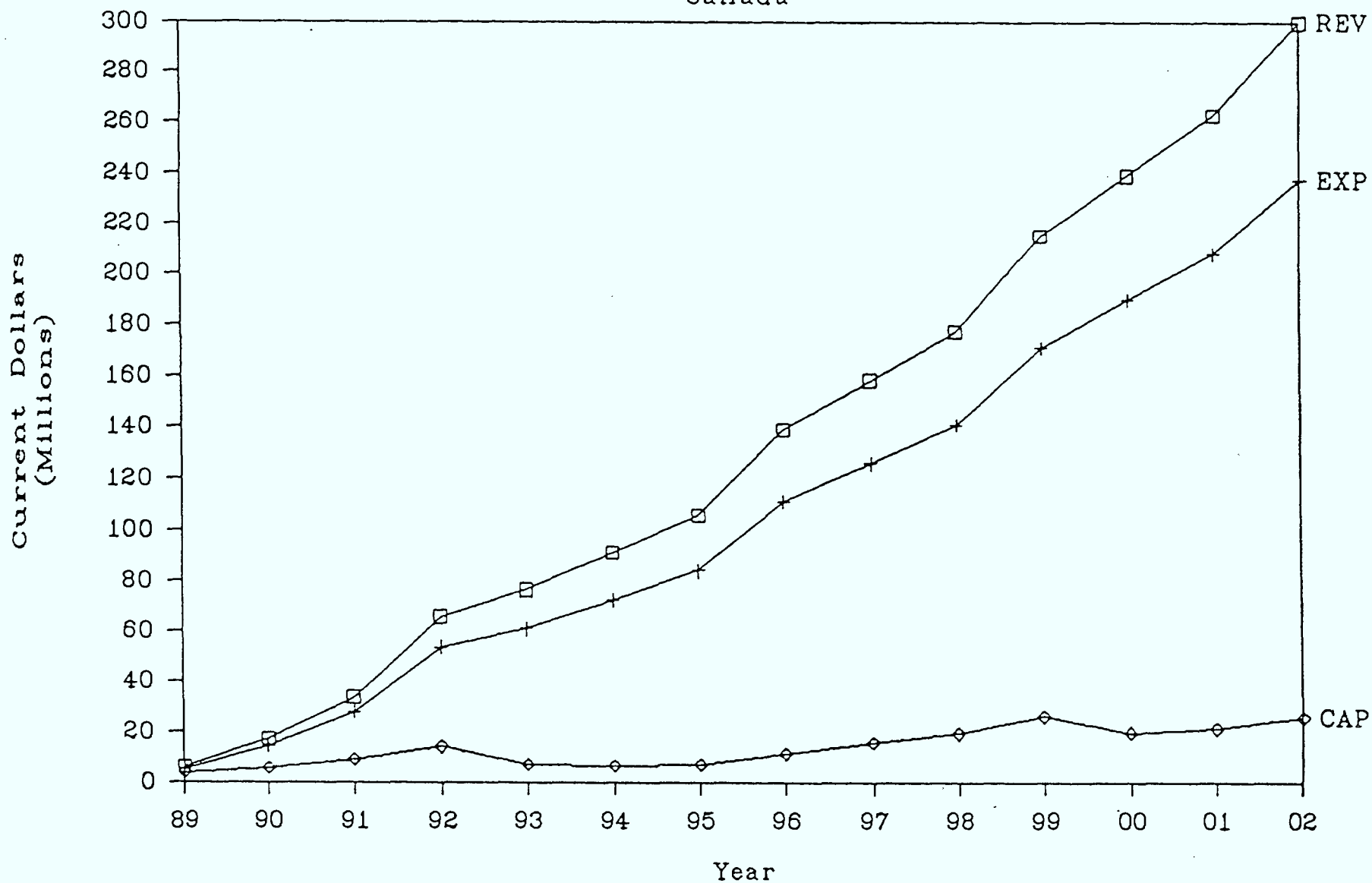
MSAT requires a very large capital investment on the part of the RCCs. Investment by the RCCs in mobile terminal equipment for rental to the end user accounts for approximately 85% of the total required investment. This is based on the assumption that 50% of the forecasted units will be rented to end users. This is an important assumption, since it has considerable impact on the cash flows and is directly related to the pricing strategy. To maintain a pricing strategy of low monthly fixed end user costs, mobile rental charges were based on a 25% markup of the costs charged over the life of the equipment.

The following graph illustrates the RCCs annual revenue, expense and investment figures for the years 1989 to 2002 in current dollars.

MRS & MTS

MSAT RCC ANNUAL REVENUE, EXPENSE, CAPITAL

Canada



MRS - MOBILE RADIO SERVICE  
REV - REVENUE

MTS - MOBILE TELEPHONE SERVICE  
EXP - EXPENSE

CAP - CAPITAL INVESTMENT

KVA Communications and Electronics Co.



Financial Analysis

The attached graph shows the cumulative cash flows and the associated net present value for the years 1989 to 2002.

The NPV (Net Present Value) calculation was based on full service including equipment sale and service, ground network facility provisioning and MSAT airtime administration.

As the graph indicates, it takes four years for the net cash flows, and six years for the cumulative net cash flows and the present worth of the net cash flows to turn positive.

Once the NPV equals zero the industry is earning its required rate of return. A positive NPV indicates returns in excess of the required return on investment. Therefore, beyond the six year point where the cumulative NPV exceeds zero, the results are extremely favourable for MSAT and for the RCC industry. The return on this project far exceeds the required rate of return on which the investment decision will be based. The only major consideration is whether an RCC can sustain the negative cash flow position that MSAT will impose in the first four years of operation. It is probable that RCCs would form some sort of consortium in order to manage this position effectively.

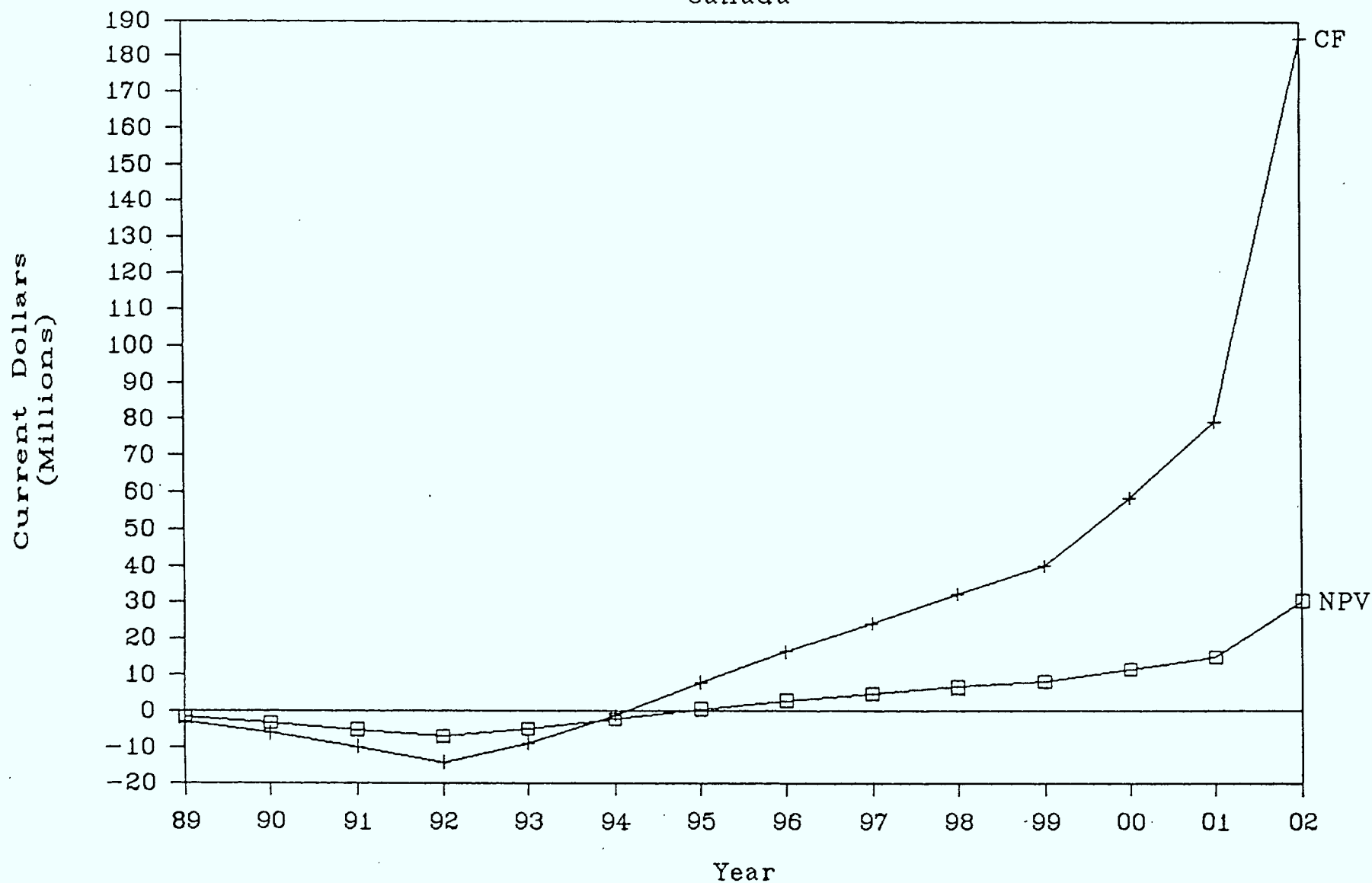
The results for the final year of the project (2002) are shown below:

	Net Cash Flow	Cumulative Net Cash Flow	Cumulative NPV
Canada (000's)	106,063	185,320	30,209

It is clear that the net incremental cash flows and the present worth of them are quite significant. It should also be noted that a significant salvage value, in the order of 97 million dollars, exists in the final year of the project (2002). While the cumulative NPV in the year 2002 is somewhat inflated by this salvage, most importantly, the NPV is positive well before 2002 and the conclusion drawn from the cash flow analysis is that MSAT would generate a significant return that would benefit the RCC industry.

MRS & MTS

# MSAT RCC Cumulative Cash Flow and NPV Canada



KVA Communications and Electronics Co.

MRS - MOBILE RADIO SERVICE  
 MTS - MOBILE TELEPHONE SERVICE  
 CF - CUMULATIVE NET CASH FLOW  
 NPV - CUMULATIVE NET PRESENT VALUE



### Job Impact

One of the most important economic benefits to be realized through RCC participation in MSAT is the employment that will be created. MSAT participation will require an extensive support system, including installation, maintenance, and administrative personnel. This will create jobs for:

- technicians
- engineers
- sales personnel
- clerks
- secretaries
- managers

On a yearly basis, we have estimated the number of new jobs created, as a result of RCC participation in MSAT to be as follows:

Year	89	90	91	92	93	94	95	96	97	98	99	00	01	02
Number of new jobs	28	34	40	62	0	0	8	26	19	16	27	22	18	54

As a comparison, the 1984 RCC workforce has been estimated at about 5000.

### **RCC MSAT Service Provisioning - Major Issues**

#### Institutional

The designation of MSAT service providers is an important issue yet to be finalized. Of particular concern to the RCC's is whether Telesat will be designated as one of the prime service providers. If so, then the scope of their mandate must clearly be defined, so that competitive arrangements are fair and equitable. RCCs feel that if large users are allowed to deal directly with Telesat on the same basis as the RCCs i.e. at the same costs, then a large portion of the MSAT market may be lost to the RCCs and the remainder may not provide the necessary incentives to justify the investment.

### Billing

The proposed MSAT billing arrangement is an issue of concern to the RCCs since it is proposed that Telesat will issue bills to the service providers, who in turn will directly invoice their end users. RCCs feel they must have access and control over their customer records and billing data since this information is critical to the operation of any communication system and must be readily accessible particularly for planning and accounting purposes. RCCs must therefore have direct access to the billing database.

Since MSAT is to be a competitive service, RCCs will require assurance that billing data is secure and will be kept confidential. Disclosure of such data could affect the ability of a service provider to effectively compete in the market place.

### Regulatory

RCCs would prefer that the licensing of MSAT mobiles be done through a "point of sale" licensing arrangement by any authorized MSAT service provider. A lengthy procedure requiring an individual license to be issued by DOC for each MSAT subscriber, is less desirable, since it could delay utilization of the service and complicate related marketing and sales activities.

### Policy

It would be to the RCCs advantage if the policies associated with MSAT service provisioning were addressed and resolved by a policy working group that included service provider representatives. Policies developed by a working group that included RCC representatives would maximize acceptance and improve understanding by both end users and service providers.

## Conclusion

MSAT represents a major opportunity for the RCCs. Failure by the industry to consolidate and adopt a common approach in implementing MSAT services could have one or all of the following consequences:

- The majority of MSAT business will remain in the hands of regulated Telcos and Telesat.
- The RCC status as a new class of carriers with regional and nationwide capabilities will be harder to achieve.
- New entrepreneurs, not part of the RCC industry, will undertake the MSAT service provisioning and could take over some traditional RCC markets by providing a greater choice of services.
- A nationwide MSAT carrier similar to CANTEL will compete with traditional RCCs and eventually take over some traditional paging and RCC MRS markets.

Because the implementation of MSAT is still a distant proposition and MSAT service in comparison to existing terrestrial services is relatively expensive, there is little serious planning taking place, with the exception of a handful of major RCCs.

Despite this lack of active business planning, the RCC industry foresees a need for MSAT services and recognizes the potential opportunities that MSAT represents. However, RCCs are concerned that Telesat, as a service provider, will put larger users out of their reach and the remaining MSAT market may not justify the required investment.

In addition, MSAT could require a change in the traditional low-capital investment business philosophy of the RCCs due to the large size of the capital investment and the slow rate with which it is charged off. Projections indicate that MSAT will comprise approximately 8%-10% of the business of the total RCC industry and a much higher percentage of those service providers involved in MSAT by the year 2002. Therefore the nature of the business for those RCCs involved in MSAT will become more capital intensive.

Finally, the investigation into the impact of MSAT on the RCCs began in August 1983 prior to the present (Jan 1985) level of conceptual design definition and prior to the release of DOC/MSAT Socio-Economic Study Assumptions (published by DOC, October 1984). Many of the early MSAT assumptions have changed since the study team completed interviews with individual RCCs. In addition, at the time this study was conducted, the official Woods Gordon/Telesat view of the total market was unavailable. It is our opinion that these factors contributed to a conservative estimate of the total market and an RCC forecast share that is consequently understated.

Despite even a conservative estimate, RCCs have projected a substantial demand for MSAT Mobile Paging Service and Data Acquisition and Control Service. It is our opinion that investment in DACS and paging services could be economically viable and recommend review of the pricing policies associated with these two services in future MSAT phases.



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RCC MSAT RESPONDENTS

1. Capital Communications & Multi Services Ltd.  
Fredericton, N.B.
2. Telephone Answering Service CB Ltd.  
Sydney, N.S.
3. Harrison-Nowell Mobile Radio Services Ltd.  
Winnipeg, Man.
4. Imperial Radio Service Ltd.  
Brandon, Man.
5. Unicorn Services Inc.  
Brandon, Man.
6. Beacon Tower Electronics Ltd.  
Grande Prairie, Alta.
7. Bridgecom Electronics Ltd.  
Lethbridge, Alta.
8. Citipage Ltd.  
Edmonton, Alta.
9. E.S.P. Communications Corp. Ltd.  
Mynarski Park, Alta.
10. Mariglen Communications Ltd.  
Red Deer, Alta.
11. Mayflex Ltd.  
Calgary, Alta.
12. Morad Communications Ltd.  
Hinton, Alta.
13. Air Northwest Telecommunications Ltd.  
Yellowknife, N.W.T.
14. A.C. Operations  
Dawson Creek, B.C.
15. Canadian Telecom Inc.  
Vancouver, B.C.
16. Callmark Radio Paging Services ltd.  
Nelson, B.C.
17. Okanagan Personal Paging  
Vernon, B.C.

18. Peace Country Telecoms and Skeena Telecoms Ltd.  
Prince Rupert, B.C.
19. R.J. Electronics ltd.  
Fort Nelson, B.C.
20. RSM Communications Ltd.  
100 Mile House, B.C.
21. TASC0 Communications Inc.  
Vancouver, B.C.
22. V.I. Paging Services Ltd.  
Victoria, B.C.
23. Beeper People  
Don Mills, Ont.
24. Christie and Walther Electronics Limited  
Ottawa, Ont.
25. Alliance Communications  
Kingston, Ont.
26. A.V. Communications Inc.  
Chatham, Ont.
27. Brant Telecommunications Ltd.  
Brantford, Ont.
28. Bridgeview Electric Ltd.  
Windsor, Ont.
29. Canadian Electronics Service ltd.  
Toronto, Ont.
30. CAS Communications Services Ltd.  
Toronto, Ont.
31. COM-TECH Radio Inc.  
Burlington, Ont.
32. Diversified Communications  
Peterborough, Ont.
33. Industrial Guard Services limited  
Toronto, Ont.
34. KEL Communications  
Windsor, Ont.
35. PasWord Communications Inc.  
Hamilton, Ont.



36. Radio-Com Communications  
Orillia, Ont.
37. Ri-Del Communications Limited  
North Bay, Ont.
38. Tas-Page Communications  
Peterborough, Ont.
39. Thunder Bay Communications & In-Touch Paging & Leasing Ltd.  
Thunder Bay, Ont.
40. Trans Provincial Communications  
Ottawa, Ont.
41. Washago Communications  
Washago, Ont.
42. Windsor Communications Company  
Windsor, Ont.
43. Wodlac Communications Limited  
Barrie, Ont.
44. Electronique Mercier ltee.  
Riviere Du Loup, Que.
45. Service Des Ondes Limitee  
Laval, Que.
46. Comm-Phase (Division of Communication Phaser Inc.)  
Ville St. Pierre, Que.
47. 123842 Canada Inc. Communications Mt. Bruno  
St. Bruno, Que.
48. Communications SR Inc.  
Chicoutimi, Que.
49. IES Telecom Ltdd.  
Ste-Fay, Que.
50. M. Leduc Ltee.  
Amos, Que.
51. Lord Radio Service Inc. (Communication L.R.S. Inc.)  
St. Jean-sur-Richelieu, Que.
52. Pagetel Inc.  
chicoutimi, Que.
53. Reynolds Radio Inc.  
Trois-Rivieres, Que.

- 54. Tele-Communications Trois-Rivieres, Ltee.  
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- 55. Teleonde Inc.  
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- \*56. Communication Systems Ltd.  
St. Johns, Nfld.
- \*57. VIP Communications Ltd.  
Winnipeg, Man.
- \*58. Brantford Telephone Answering Service Ltd.  
Brantford, Ont.
- \*59. Colcom Communications  
Montreal, Que.
- \*60. Communication Le Bocher Inc.  
Grand Mere, Que.
- \*61. Communication Services (Royal) Inc.  
Sherbrooke, Que.
- \*62. Dialcom Communciations Ltd.  
Barrie, Ont.
- \*63. Distacom Communications Ltd.  
Burnaby, B.C.
- \*64. MacLean Hunter Paging  
Toronto, Ont.
- \*65. The Message Network ltd.  
Kingston, Ont.
- \*66. Motorola Canada Limited  
North York, Ont.
- \*67. Millman's Communication Services (1964) Ltd.  
Edmonton, Alta.
- \*68. Fox Radio Systems Ltd.  
Chilliwack, B.C.
- \*69. Laval Communications Inc.  
Laval, Que.
- \*70. Northern Commercial Electronics Ltd.  
Orillia, Ont.
- \*71. Oxford Communications Ltd.  
Woodstock, Ont.

- \*72. Pagette Airsignals Ltd.  
Toronto, Ont.
- \*73. National Telesystem Ltd.  
Ste-Fay, Que.
- \*74. Radio-Phones Ltd.  
Toronto, Ont.
- \*75. Runke Radio Communications (1980) Ltd.  
Kitchener, Ont.
- \*76. Scotcomm Radio Inc.  
Montreal, Que.
- \*77. Steel Electronics Ltd.  
Sudbury, Ont.
- \*78. Systel Electronics Ltd.  
Drayton Valley, Alta.
- \*79. Till Communications Ltd.  
Lloydminster, Alta.
- \*80. Time Communications Ltd.  
Ottawa, Ont.
- \*81. Total North Communications  
Whitehorse, Yukon
- \*82. Two-Way Communications (1983) Ltd.  
Waterloo, Ont.
- \*83. West Can Electronic Services ltd.  
Calgary, Alta.
- \*84. Williams Communication Services Limited  
Oshawa, Ont.
- \*85. WR Communications Ltd.  
Vancouver, B.C.
- \*86. York Telecommunications Ltd.  
Toronto, Ont.

\*Participated in in-depth interviews



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