Department of Communications
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Review of the Procurement Practices and Policies and the Intercorporate Financial Relationships of the British Columbia Telephone Company

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1. INTRODUCTION

1.1 Purpose

On February 14, 1975, I announced that an inquiry would be undertaken, under my direction, into the procurement practices and policies and the intercorporate financial relationships of the British Columbia Telephone Company (B.C. Tel). This announcement was made following upon my review of the CTC decision on the 1974 application of B.C. Tel for rate increases, and my subsequent exchange of correspondence with Mr. Strachan, Minister of Transport and Communications, Province of British Columbia. The terms of reference for the inquiry stated that:

- The objective of the inquiry shall be to inquire into the intercorporate and other transactions and contractual arrangements between B.C. Telephone and other affiliates of General Telephone and Electronics of New York, with particular reference to:
  - the reasonableness of the carrier's purchasing practices and policies, and
  - the reasonableness of their intercorporate transactions, financial arrangements and contractual agreements with GTE affiliates

  in relation to the impact of these practices, policies and arrangements upon the carrier's rates and tariffs and the quality of service provided, to report on these matters, and to draw conclusions where they may be appropriate.

This document contains my findings from the inquiry and the conclusions I have drawn from the facts examined.

1.2 Methodology

Most of the information analyzed was provided by B.C. Tel, Automatic Electric (Canada) Ltd., (A.E. Co.), and Lenkurt Electric (Canada) Ltd., (Lenkurt), on the basis of questionnaires prepared for each of the three principals. Initial responses led to a process of discussion, further questionnaires and further discussion. B.C. Tel provided copies of various engineering and economic studies made prior to major purchasing decisions. The discussions with company executives were a vital component in the process of establishing the facts. Discussions were also held at the offices of Phillips Cables Ltd. in Brockville, regarding the agreement whereby A.E. Co. acts as distributor for Phillips, particularly as the arrangements affect the sales of telephone cables to B.C. Tel. In no case was there any reluctance to divulge information, although the suppliers were concerned with commercial confidentiality aspects. All the information requested was made available, subject to some slight exceptions detailed later.

In view of the public nature of this report the confidential information provided has been aggregated, where necessary, in order to protect this confidentiality. In addition, some minor discrepancies may be observed between figures quoted by B.C. Tel and by suppliers, and between figures used in connection with intercorporate financial transactions and those relating to purchasing activity. This is due to the fact that it was easier in some cases for the carrier or supplier to provide figures with such items as taxes included, and in other cases excluded. Timing differences also played a minor part. Such discrepancies are not significant with respect to the conclusions of the report.

1.3 Organization of the Study

This review examines the intercorporate arrangements, financial transactions, and purchasing arrangements between the British Columbia Telephone Company and a number of its corporate affiliates. B.C. Tel and these affiliates are all controlled by General Telephone and Electronics (GTE) of Stamford, Conn. A brief description of the GTE corporate structure is provided.

B.C. Tel's procurement of telecommunications equipment from two manufacturing affiliates is reviewed, as are certain details of these manufacturers' sales to other customers. For the major product categories, price comparisons have been made to the extent possible.

The past and future telephone switching technologies that are available to B.C. Tel are discussed, particularly to determine the extent to which planning has been or will be influenced by the availability of new products from the manufacturing affiliates.

The intercorporate contractual arrangements are analyzed in terms of the regulated affiliates as a group on the one hand and the unregulated affiliates as a group on the other. The relative profitability to GTE of each of these groups is calculated and evaluated, as a means of assessing the impact on B.C. Tel's rates and tariffs of the corporate structure and procurement policies reviewed in these pages.

2. SUMMARY AND CONCLUSIONS

2.1 Summary of Findings

In the five years 1970-74 inclusive, B.C. Tel purchased 82 per cent of its telecommunications hardware in four major categories from two manufacturing affiliates, A.E. Co. and Lenkurt. These purchases amounted to approximately $250 million in the five years.

The procurement practice of B.C. Tel over this period has been to purchase all hardware possible from the supply affiliates. In general, outside sources of supply have been used only when one or other of the affiliates has not had a suitable product available. The prices paid by B.C. Tel to its affiliates are just and reasonable for station equipment for which a competitive market exists. For transmission products, where a competitive market also exists, B.C. Tel buys most of its equipment from Lenkurt and pays the same price as other telephone companies.

Over 98 per cent of B.C. Tel's local switching equipment is purchased from A.E. Co. For the newer electronic switching systems, B.C. Tel pays the same price as other telephone companies. For the older step-by-step switching systems (SXS), a truly competitive market no longer exists in Canada. A.E. Co. list prices for a number of selected items of SXS equipment were compared with Northern Electric list prices and found to be generally lower. It was not possible to determine whether the prices paid by B.C. Tel are reasonable in relation to the costs of manufacture.

B.C. Tel purchases over 99 per cent of its telephone cable requirements from A.E. Co., which acts as distributor for Phillips Cables Ltd. in Canada. The telephone company is paying the lowest possible prices given the commission arrangements now in effect. Elimination of the commission arrangements could result in lower prices.

B.C. Tel's planning for the introduction of new switching technology into the system has been influenced by the availability of equipment from A.E. Co. Consequently, B.C. Tel installation of electronic switching has been behind that of other telecommunications carriers. The equipment selected has been supplied by A.E. Co. except when it was necessary to provide specialized features and services not available from A.E. Co. products.

It will be several more years before A.E. Co. has a range of switching products that will enable the company to serve as a principal supplier to B.C. Tel. The telephone company's plans for the future installation of electronic switching systems are not detailed beyond 1976. The company states that these plans are dependent upon the future financial state of the company; however, the evidence indicates that B.C. Tel will continue to rely on the availability of A.E. Co. products to meet future switching requirements.

The inquiry into the intercorporate relations of B.C. Tel reveals that the carrier is part of a highly-integrated corporate structure consisting of both regulated and unregulated operations. The return on owner's equity in the unregulated affiliates has been significantly greater than that yielded on either the overall investment in the Canadian communications equipment manufacturing industry or on the average of all industries in Canada. There is no evidence to indicate that this situation results from excessive pricing of the goods and services provided to B.C. Tel by affiliates.

2.2 Conclusions

1. Whenever possible, B.C. Tel buys from affiliates. In the case of station and transmission equipment, for the five years under review, there is no indication that this has been to the detriment of the B.C. Tel subscriber. The conclusions with respect to switching equipment centre around choice of technology rather than price. In the case of cable, although the absolute amount may not be large, it is concluded that a change in purchasing arrangements could be to the advantage of the subscriber.

2. The management of B.C. Tel has been influenced in its decisions on the purchase of goods and services by its corporate affiliations. The facts reviewed in the course of the inquiry indicate that the telephone company management's decisions regarding the nature and timing of the switching technology to be employed have been dictated by what is developed and made available by Automatic Electric.

3. A major program is being undertaken to modernize and expand the switching facilities of B.C. Tel, in light of current and forecast future demand. The financial impact of this program upon B.C. Tel subscribers will reflect both the need to finance the heavy capital outlays involved, and the higher cost of the technology now employed for modernization, as compared to that available in recent years.

4. The telephone company management must be free to choose the technology and equipment best suited to the needs of British Columbia. Some of the newer products of A.E. Co. are suited to B.C. Tel's future switching requirements. However, this manufacturer does not have, at the present time, a range of equipment to enable it to serve as the principal supplier to B.C. Tel. Therefore, it is imperative that in the future B.C. Tel's management be entirely free from any influence exercised by its manufacturing affiliates in its planning and procurement decisions.

5. B.C. Tel is part of a highly-integrated operation in Canada in which the profitability is greater in the unregulated than in the regulated sector. However, evidence indicates that the profits have not been derived from excessive pricing of goods and services to B.C. Tel. It is concluded that the existence of assured markets for these goods and services has made a significant contribution to the profit maximization.

3. THE GTE CORPORATE STRUCTURE

3.1 Origins and History

Incorporated in New York in 1934, GTE (which until 1959 was known as the General Telephone Corporation) was for twenty years a holding company for some fifteen telephone operating companies. It had no manufacturing capability. However, in 1951 GTE began a series of acquisitions by which it developed into a large communications and manufacturing conglomerate.

B.C. Tel's association with GTE arose as a result of the 1955 merger of GTE and Theodore Gary and Company which, through Associated Telephone and Telegraph, controlled the Anglo-Canadian Telephone Company (Anglo-Canadian) which had been incorporated in Quebec on March 2, 1935. Anglo-Canadian, despite its name, is not an operating telephone company, but a holding company which holds a controlling interest in B.C. Tel, Quebec Telephone, Dominican Telephone Company, York Investments Ltd., Dominion Directory, and (until 1973) Canadian Telephones and Supplies (C.T. & S.). This last was sold to B.C. Tel, upon the recommendation of the Canadian Transport Commission, in 1973.

The 1955 merger provided for GTE substantial manufacturing capability, in the form of the Automatic Electric Company of Chicago which, next to Western Electric, was the largest manufacturer of telephone equipment in the United States, and which operated wholly-owned subsidiaries in Canada, Belgium and Italy. In 1957, ownership of GTE Automatic Electric (Canada) Ltd. (A.E. Co.) passed to Automatic Electric International Incorporated, a subsidiary of the Automatic Electric Company and, in 1972, ownership passed to GTE International Incorporated.

With the acquisition of A.E. Co., GTE also acquired a part interest in Lenkurt Electric; four years later GTE acquired the balance of Lenkurt's stock. The shares of Lenkurt (Canada), established in Vancouver in 1949, were held by Lenkurt (U.S.) until 1960, when they were transferred to GTE International Incorporated. At the end of 1966, GTE Automatic Electric (Canada) Ltd. acquired all of the shares of GTE Lenkurt Electric (Canada) Ltd.

Also in Canada, effective April 30, 1953, the assets and business of the wire and cable operation of Phillips Electrical Works (a subsidiary of Automatic Electric Company but controlled by Associated Telephone and Telegraph) were sold to British Insulated Callender's Cables Limited (BICC) of the U.K., while a new company, called Automatic Electric Canada (1953) Limited, was set up to take over the telephone equipment manufacturing operation hitherto carried out by Phillips. This company evolved into GTE Automatic Electric (Canada) Ltd. The sales company, Automatic Electric (Canada) Limited, in course of time changed its name to Automatic Electric Sales (Canada) Limited, but continued as the only distributor of the communication wire and cable manufactured by BICC (now Phillips Cables Limited) together with the products of the equipment manufacturer, Automatic Electric Canada (1953) Limited. At the end of 1965, the sales company was merged with GTE Automatic Electric (Canada) Ltd. (A.E. Co.). Thus, a close relationship between A.E. Co., Phillips and B.C. Tel has existed for many years.

Besides its transactions with its parent, Anglo-Canadian, with Dominion Directory, and with its own subsidiaries, Okanagan Telephone and CT&S, B.C. Tel also deals directly with A.E. Co. and Lenkurt, its principal hardware suppliers. Other GTE affiliated firms with which B.C. Tel has dealt directly are the GTE Service Corporation (GTESC) and GTE Data Services (GTEDS) - the former

providing advice and assistance on a wide range of matters of concern to B.C. Tel, and the latter providing computer and software services. Both GTESC and GTEDS are wholly-owned U.S. subsidiaries of GTE. GTESC and GTEDS also deal with other companies in the General System.

Dominion Directory's contact with other GTE affiliates is minimal and has been confined to General Telephone Directory and, of course, its parent, Anglo-Canadian. Anglo-Canadian deals directly with its parent, GTE, and with the GTE Service Corporation, in addition to its contacts with its subsidiaries. CT&S has only minimal contacts with other GTE affiliates.

4. PROCUREMENT POLICIES AND PRACTICES

4.1 General

The procurement policies of B.C. Tel have been stated on several occations. In October 1974, Mr. Gordon McFarlane, Vice-President, Corporate Development, B.C. Tel, informed the Canadian Transport Commission (CTC) hearing into B.C. Tel's rate application:

> "As far as our purchasing is concerned we make our own decisions and we do not have any obligation to purchase from a particular supplier."

In this section of the report, B.C. Tel procurement practices over the five years 1970 to 1974 inclusive are examined relative to the stated policy.

The company readily agrees that its two GTE affiliates in Canada, A.E. Co. and Lenkurt, have provided most of the telecommunications hardware purchased in recent years. The objective of this section is to determine if the prices charged B.C. Tel by its affiliates are reasonable in comparison to prices paid by other carriers for similar products.

4.2 B.C. Tel Purchases from GTE Manufacturing Affiliates

B.C. Tel's capital spending includes the purchase of land, buildings, office equipment, vehicles, tools, etc. These items accounted for about 10 per cent of capital spending in the five years 1970 to 1974. The remaining 90 per cent was spent to support and sustain the telephone plant construction program, further subdivided into approximately 40 per cent labour, 60 per cent telecommunications hardware. This division is in line with industry averages.

For the five years 1970 to 1974 inclusive, B.C. Tel spent approximately $362 million for purchase of hardware, over 80 per cent of which was spent on the four major categories of equipment shown in Table 1.

Table 1: B.C. Telephone Purchases of Equipment from GTE Affiliates in Selected Categories, Expressed as a Percentage of Total Purchases

	1970	1971	1972	1973	1974
From A.E. Co.					
- Switching	85	93	94	88	96
- Wire and Cable	99	99	99	99	99
- Station Equipment	87	81	62	60	47
From Lenkurt					
- Transmission	53	56	56	71	75

Table 1 confirms the position of the GTE affiliates as major suppliers to B.C. Tel in the four categories shown. Sections 4.3 and 4.4 discuss the suppliers distribution of sales, together with some price comparisons.

4.3 GTE Automatic Electric (Canada) Ltd. (A.E. Co.)

4.3.1 Customer/Product Sales Distribution

As a major manufacturer and supplier to the telephone industry, A.E. Co. has followed the industry pattern established by the Bell System in the United States. Major volume items of equipment are manufactured; other items are purchased from other manufacturers and resold to the telephone companies. For the five years under review, the manufactured/distributed products ratio for A.E. Co. has averaged about 50/50, with total sales for the 5-year period of $401 million (FST included).

The products manufactured by A.E. Co. consist mostly of switching equipment and various types of telephone sets. The ratio between manufacturing and distributed products is much lower than for other North American manufacturers such as Western Electric and Northern Electric. This is mostly accounted for by the fact that these two companies manufacture transmission equipment (radio and multiplex) and telephone cable, whereas within the GTE organization in Canada transmission equipment is manufactured and sold by Lenkurt, and cable is manufactured by Phillips Cables Ltd. and distributed by A.E. Co. As well, A.E. Co. does not manufacture a complete line of station equipment.

Tables 1-1 and 1-2 in Appendix 1 show breakdowns of A.E. Co. sales to B.C. Tel in relation to total sales. These tables indicate that B.C. Tel is the major customer of A.E. Co.

4.3.2 Price Comparisons - Step-by-step (SXS)[1]/ Switching Equipment

Table 1 showed that in the five years 1970 to 1974, B.C. Tel purchased the majority of its SXS switching equipment from A.E. Co., for an amount totalling over $61 million in the period. In 1970 purchases totalled $7.7 million; they rose to $19.1 million by 1974. B.C. Tel forecasts for 1975 and 1976, which are essentially firm commitments, show that purchases of SXS will continue at a high level, amounting to 74 per cent (by lines) of all local switching equipment in 1976.

1/ A brief explanation of the various technologies used and the related terminologies may be found in Section 5.

A.E. Co. has three levels of pricing for SXS equipment:

(a) Bulk Pricing

The highest rate of discount. B.C. Tel is the only customer that orders in bulk.

(b) Contract Sales (Initial offices and additions)

All carriers, including B.C. Tel, receive the same discount on contract sales. About 13 per cent of B.C. Tel purchases are in this category.

(c) Merchandise Sales

No discounts from list price. Less than 10 per cent of B.C. Tel's purchases are in this category.

From a random examination of copies of A.E. Co. invoices that were submitted to a number of customers, it was found that B.C. Tel pays the lowest prices for SXS when buying in bulk. It was also found that B.C. Tel never pays more than other customers in the other price categories.

These findings were of limited value due to the fact that in the five years 1970 to 1974, GTE affiliates have purchased over 78 per cent of A.E. Co.'s SXS output[2/] and B.C. Tel was by far the largest customer. Sales to non-GTE affiliates were not considered to be of sufficient volume to be regarded as the price-setting criterion.

A.E. Co. was requested to supply information on manufacturing costs for SXS, in order to determine the overall profitability of SXS sales. A.E. Co. did not accede to this request on the grounds that:

> "While we realize that direct comparison of individual sales of switchgear equipment is extremely difficult and non-conclusive, we also think the comparison of profit margins on sales is equally futile where it involves many arbitrary allocations in plant producing a variety of products."

2/ See Table 1-3, Appendix 1.

Instead, A.E. Co. responded by preparing a table showing gross margins on sales to non-GTE customers as a percentage of gross margins on sales to B.C. Tel. This table confirmed that A.E. Co. makes a lower margin of profit on sales to B.C. Tel than on sales to other customers. However, the comparison was between $53 million sales to B.C. Tel and $11 million to the rest of A.E. Co. customers. From this volume of purchases B.C. Tel could be expected to get the best price.

Two other methods of price comparison were explored. Information was requested on SXS pricing in the United States from the Rural Electrification Authority (REA), a U.S. Government Agency which provides low-cost loans and technical advice to small independent companies. Unfortunately, REA could not provide information to make direct comparisons with prices in Canada. A comparison was made between A.E. Co.'s list prices for SXS equipment and list prices of Northern Electric for a number of selected apparatus items that are used in quantity in SXS offices. Based on the limited information available, it is evident that a truly competitive market for SXS equipment no longer exists in Canada, but where direct comparisons are possible, A.E. Co.'s list prices are generally lower.

It was therefore not possible to determine that the prices paid by B.C. Tel for SXS equipment are reasonable in relation to costs of manufacture. In comparison to prices charged by other suppliers the prices paid by B.C. Tel to A.E. Co. were found to be reasonable.

4.3.3 Price Comparisons - Electronic Common Control (ECC) Switching

A.E. Co.'s sales of ECC switching systems are shown in Table 1-4 of Appendix 1. Pricing policy for ECC switching equipment differs markedly from the three-level structure used for SXS sales. There are no discounts for ECC. All customers pay the same price. This was confirmed by a review of quotations submitted to several customers, including B.C. Tel. It is virtually impossible to make absolute comparisons, because no two jobs are the same; however, it was possible to confirm the "no discount" policy.

It is difficult to make direct price comparisons between the two ECC machines manufactured by A.E. Co. and similar products made by other manufacturers. The small C1 EAX has no counterpart. The #1 EAX is only comparable with Northern Electric's SP-1 over a limited size range. Depending upon size, some applications are more suitable for SP-1, others favour #1 EAX. Alberta Government Telephones and SaskTel, two carriers who are not affiliated with a supplier, have purchased the SP-1 from Northern and the #1 EAX from A.E. Co. It may be assumed that these purchases were the result of favourable economic and technical evaluations, and it is therefore concluded that the #1 EAX manufactured by A.E. Co. is, like the SP-1, competitive in certain size ranges and less competitive in others.

4.3.4 Price Comparisons - Wire and Cable

The telephone cable business in Canada can be summarized as two major suppliers serving the ten major telecommunications carriers accounting for over 90 per cent of the market, estimated at over $200 million annually. Most carriers do not call for competitive tenders for their cable requirements; prices are negotiated. For major users, it is the negotiated discount from

the list price that determines the final price paid. Discounts are very much related to volume of purchases. The actual prices paid appear to be a closely guarded secret, even between one carrier and another.

Northern Electric and Phillips are the two major suppliers. Their price lists were compared for the major sizes and types of cables that account for over 80 per cent of telephone company purchases. The list prices were exactly the same. Both companies offer identical 4 per cent discounts to major telephone companies.

Northern Electric's largest customer is Bell Canada. The largest single customer of Phillips in Canada is A.E. Co., which accounts for over half of Phillips' total telephone cable sales.

The relationship between A.E. Co. and Phillips is one of distributor/manufacturer. A.E. Co. describes the arrangement as follows:

> "GTE Automatic Electric (Canada) Ltd. is the distributor of Phillips communications wire and cable in Canada with the exception of Bell Canada, its subsidiaries and affiliates. We also distribute their products in some export markets and are large users of their products in our own production. There is no common ownership or corporate relationship between the two companies."

About 7 per cent of the cable sold to A.E. Co. is incorporated into products manufactured by A.E. Co., but the vast majority is resold to telecommunications carriers. Table 1-5 in Appendix 1 shows the distribution of A.E. Co. sales.

A.E. Co. provided full details of the discount structure as it relates to the purchases of telephone cable from Phillips and the subsequent resale of the cable to B.C. Tel and other customers. An examination of customer invoices proved that B.C. Tel enjoys a lower price than any other customers served by A.E. Co. This was expected because sales to B.C. Tel account for almost 75 per cent of A.E. Co.'s total sales. This volume entitles B.C. Tel to lower prices. The only true measure would be a comparison of cable prices paid by Bell Canada to Northern Electric with prices paid by B.C. Tel to A.E. Co. Bell Canada were not willing to divulge this information. However, the Canadian Transport Commission (CTC) decision in the case of the B.C. Tel 1974 rate application contained the following statement with respect to cable pricing:

> "Finally on this subject, in the light of information available to the Commission on cable prices paid by other carriers under its jurisdiction, we do not find the the prices being paid by B.C. Tel for Phillips cable to be unreasonable. What, if any, benefit by way of price reduction would result to B.C. Tel if Phillips, which is not affiliated with the GTE group, adopted a policy of selling its cable directly to B.C. Tel, is a question we are unable to answer and on which no evidence was adduced." (emphasis added.)

From this it may be assumed that the CTC compared cable prices paid by Bell Canada and B.C. Tel and that due allowance has been given to the volume discounts that could reasonably be expected to apply. There still remains the question that the CTC was unable to answer, namely, whether B.C. Tel could obtain better prices by dealing direct with Phillips. This question is now examined.

The agreement between A.E. Co. and Phillips by which the former acts as distributor of products manufactured by the latter contains a discount and commission structure whereby A.E. Co. is paid a commission based on services rendered. For the small telephone companies whose cable purchases may amount to only a few hundred thousand dollars a year, A.E. Co. undoubtedly earns its commission, because the small accounts are costly to service. But even for the larger carriers who prefer to deal directly with Phillips, the A.E. Co. salesman still services the account, and A.E. Co. is paid a distributor commission in accordance with the 1953 agreement as renegotiated from time to time. In the light of this practice, it would appear that if B.C. Tel were to purchase directly from Phillips, A.E. Co. would still receive a commission on these sales, although not necessarily the same percentage. This explains B.C. Tel's statement[3]/ that dealing direct with Phillips would not guarantee lower cable prices.

B.C. Tel is the second largest market for telephone cable in Canada, and the only major carrier relying on A.E. Co. as distributor. As a middleman in the B.C. Tel/A.E. Co./Phillips transactions, A.E. Co. provides only the minimal clerical and marketing practices, never the more traditional distributor functions of warehousing and delivery. Despite the volume of purchases, B.C. Tel has been unable to negotiate a direct purchase agreement with Phillips that would ensure lower prices, or even prices equal to those now being paid to A.E. Co.

It is concluded that B.C. Tel is paying the lowest possible prices for telephone cable in the light of the commission arrangements now in effect, and that direct purchase of cable from Phillips, together with elimination of the commission arrangements, could result in lower prices.

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[3]/ Evidence 1974 Rate Hearing.

4.3.5 Price Comparisons - Station Equipment

As Table 1 showed, A.E. Co. is still a major supplier of station equipment to B.C. Tel, but in recent years B.C. Tel is buying more station equipment from other suppliers. Table 1-6 in Appendix 1 shows distribution of A.E. Co. sales.

In 1970, four major categories of station equipment, telephone sets, key equipment, small PBX, and larger PBX, accounted for about 80 per cent of B.C. Tel's total purchases of station equipment. In the first three categories A.E. Co. supplied over 99 per cent of the requirements, and 88 per cent in the fourth category. In 1974, A.E. Co. had lost ground in all four categories in percentage terms. This is related to the fact that A.E. Co. no longer manufactures or distributes a full line of station equipment.

A.E. Co.'s major sales to B.C. Tel are telephone sets and a large PBX imported from Japan. Only one other carrier is buying the PBX in quantity. B.C. Tel receives a small discount from the list price. A.E. Co. were successful bidders to supply Alberta Government Telephones' and Edmonton Telephones' 1975 requirements for telephone sets, in competition with two other suppliers. B.C. Tel, by virtue of its volume purchases, enjoys a comparable price.

For most other items of station equipment purchased from A.E. Co., an examination of invoices has confirmed that B.C. Tel usually receives the lowest price; they never pay more.

A.E. Co. is still B.C. Tel's preferred supplier for station equipment, whenever they have a product to offer. But subscribers are becoming more selective, particularly business users, and B.C. Tel has gone to alternative suppliers in order to meet some customer demands.

4.4 Lenkurt Electric (Canada) Ltd., (Lenkurt)

4.4.1 Customer/Product Sales Distribution

Lenkurt provided an extensive breakdown of their sales of major product to individual customers. Transmission equipment is often purchased in large quantities. Furthermore, Lenkurt has several competitors in Canada. These factors are reflected in the sales figures, which are summarized in Table 2-1, Appendix 2. Despite the fluctuation in sales volume, the customer mix has remained fairly constant over the five-year period, with total sales of $131 million (FST and PST excluded).

Table 2-1 indicates that B.C. Tel is an important customer for Lenkurt. It is also evident that sales to other telephone companies are increasing.

4.4.2 Price Comparisons - Transmission Equipment

Table 1 showed B.C. Tel's transmission purchases from Lenkurt, as a percentage of total purchases, rising from 53 per cent in 1970 to 75 per cent in 1974. Table 2-2 in Appendix 2 shows a more detailed breakdown by product category.

Two products account for most of the purchases: Lenkurt's PCM cable carrier, and the 46A3-C heavy route multiplex. Many other carriers are buying these products in quantity.

Lenkurt maintains a uniform pricing policy across Canada. B.C. Tel pays the same price as any other telephone company. This has been confirmed by an examination of customer invoices.

There has been no attempt to make engineering or economic evaluations between Lenkurt's products and other manufacturers' products. Lenkurt has a wide range of customers, 60 per cent of sales are by competitive tender, and the fierce competition virtually assures low prices.

The purchasing pattern is familiar. If Lenkurt has the product, B.C. Tel will usually buy it. B.C. Tel pays the same price as other carriers; the actual prices are established in the competitive market.

5. TECHNOLOGICAL CONSIDERATIONS

5.1 General

The procurement policies of all telephone companies are characterized by a marked tendency to adopt standard designs and to adhere to these over long periods of time. This tendency is most evident in switching equipment, where the economic and operating benefits of standardization are enhanced by the longevity of the equipment. Carriers have an opportunity to make a choice with respect to switching technology infrequently, and decisions have long-term economic implications for the quality of service that is provided. This review of technology considers only switching equipment.

Up until 1948, most telephone companies in North America relied heavily on so-called step-by-step (SXS)[4]/ switching systems, all based on the Strowger switch invented in 1889.

In 1948, the Bell System introduced a local crossbar switching system based on the principle of common control[5]/. Bell Canada started installing crossbar for local switching in 1956, and most Canadian carriers followed suit. However in 1973, 58 per cent of Bell Canada lines were still served by SXS switching, which is a tribute to the flexibility and durability of the older design.

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[4]/ Step-by-step is descriptive of the way in which a telephone call is connected through the exchange. As the caller dials each digit, the Strowger switches respond to each digit dialed, thus connecting the call on a step-by-step basis. The path through the exchange from caller to called party is only completed when the complete number is dialed.

[5]/ In common control systems, a "register" records the called number as it is dialed into the exchange. When the complete number is recorded, the information is passed to a marker, which verifies the information, tests if the called number is busy, then sets the "Crossbar" switches to connect the two parties together. Registers and markers control the setting up of the call, and they are common to a large number of lines, hence the term.- common control. The basic advantage of common control is that intelligence can be built into the marker, so that the machine can make a number of decisions, such as alternate routing of a call if the first choice path is blocked.

The notable exception among the major Canadian carriers in the move to crossbar equipment was and still is B.C. Tel. According to Mr. Gordon McFarlane, Vice-President, Corporate Development of B.C. Tel[6], the Company decided in 1959 to stay with the SXS system, until the availability of electronic switching systems, which many manufacturers had in various states of development.

B.C. Tel's decision has to be considered in the light of an earlier decision by GTE. In the late 1950's, GTE decided not to manufacture what they considered to be the interim technology of crossbar common control, but instead to continue the production of SXS until they could develop electronic switching systems.

B.C. Tel's decision to continue the use of SXS equipment was not made as a result of any single study, but on the basis of a continued review of available and forecast technology up to 1959. However in 1973, B.C. Tel commissioned the GAMMA[7] Study which was intended as an independent and objective review of the 1959 decision. This study was discussed at the 1974 B.C. Tel Rate Hearing before the CTC and the Commission, in their decision, referred to it as follows:

> "... The so-called "GAMMA" Study may or may not prove the decision was a correct one. The Company interpreted its conclusions one way while the Attorney General (of British Columbia) took the opposite meaning. ... The fact is that the decision was made, and we are faced with the telephone system as it now exists in 1974-75 ..." (Emphasis added).

After examining a copy of the GAMMA Study, it was decided that any current effort to retrace history back to 1959 might also be subject to more than one interpretation. It was decided instead to concentrate on B.C. Tel procurement practices in more recent years, keeping in mind the SXS/Crossbar decision.

6/ Evidence of 1974 Rate Hearing.

7/ Gamma Management Engineering Co. Ltd., Edmonton, Alta.

5.2 Switching Technology

B.C. Tel utilizes a number of switching technologies which are listed and described briefly in Appendix 3. The listing confirms the role of A.E. Co. as the major supplier of switching equipment to B.C. Tel. It also shows that B.C. Tel has adhered to the 1959 decision.

At the end of 1974, less than 2 per cent of installed lines were electronic common control (ECC). The balance of the local switching was provided with SXS equipment. All of the switching equipment purchased in the five years 1970 to 1974 inclusive was supplied by A.E. Co., with two exceptions: the #4A TSS installed in 1971, and the #5 Crossbar installed in 1972. B.C. Tel has also ordered an SP-1 to be in service in 1976. These three installations were purchased from Northern Electric to provide features and services not available from A.E. Co. products.

Because B.C. Tel eschewed crossbar in 1959 in order to wait for the introduction of ECC systems, it could be expected that they would be one of the first customers for ECC as soon as it became available. However, the evidence does not support this expectation. The first B.C. Tel installation of ECC did not take place until 1971 when five offices were placed into service in small communities. These offices were the first <u>small</u> ECC machines commercially available from A.E. Co., the Canadian developed C1 EAX. A sixth C1 EAX was installed in 1973.

The next ECC installation went into service in December 1974, when the first <u>large</u> capacity ECC machine commercially available from A.E. Co., the #1 EAX, was installed at Oak Bay, a residential suburb of Victoria. In 1971-72, B.C. Tel made three studies to compare Northern Electric's SP-1 with A.E. Co.'s #1 EAX to determine the best choice for the Oak Bay, Mutual, and Fairfax installations, completing in December 1974, February 1975, and March 1975, respectively. The Mutual and Fairfax were suitable applications for the #1 EAX, but the Oak Bay study acknowledged:

> "In view of the requirement for only 28,000 working lines at the year 2000, the SP-1 is a more desirable size machine".
>
> "At the current time Oak Bay is a unique situation. The next similar location is Dallas which will be required in 1976 or 1977. At that time #2 EAX[8]/ will be available and could be more economical than the SP-1, as it is designed for the size required at Dallas."

Factors other than size and first costs were involved in the selection of a machine for Oak Bay. The B.C. Tel Study showed a 12 per cent saving in start-up cost for the SP-1 at Oak Bay, with no penalty in annual charges over the 20-year planning period. Nevertheless, the A.E. Co. #1 EAX was purchased on the grounds that no other applications were foreseen in the network for the medium-sized SP-1 machine. Installing a single 'orphan' SP-1 at Oak Bay would result in increased costs over the life of the machine. The medium-sized SP-1 however is readily utilized in the suburban and smaller core offices, which outnumber the metropolitan offices by at least 3:1. It is reasonable to infer therefore, that some applications for a medium-sized system would occur between 1971 and 1978, the respective introductory dates for SP-1 and its A.E. Co. counterpart the #2 EAX.

One other major factor influencing B.C. Tel's conversion program from SXS to ECC is the point at which the SXS equipment outgrows the building. All of the ECC systems that are installed or planned are associated with building extensions or a new building (except the Mutual office), and the installations are all either small or large. It would be reasonable to assume that building problems would also occur in medium-sized offices, being the result of early decisions long since invalidated by unforeseen growth or new zoning bylaws and therefore random in nature.

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[8]/ Another A.E. Co. product. Introduction has since been deferred to 1978.

Whether or not there are medium-sized offices with building problems, the Oak Bay study indicates that B.C. Tel do not plan to introduce a medium-sized ECC machine into the system until 1978.

Table 2 shows a brief summary of the evolution and availability of ECC switching technology in Canada:

Table 2: Introduction of ECC Switching

Date	Event	Supplier	B.C. Tel Action
1967	First large ECC (#1 ESS)	Northern Electric[9]/	
1971	First small ECC (C1 EAX)	A.E. Co.	5 installations in 1971
1971	First medium ECC (SP-1)	Northern Electric	1 planned for 1976
1974	Second large ECC (#1 EAX)	A.E. Co.	4 installed 1974-75

The above table indicates that A.E. Co. were late in the introduction of ECC systems. B.C. Tel were late introducing ECC into their local network. Adding these two facts together, it appears that B.C. Tel were not so much committed to staying with SXS until ECC was available, but staying with it until ECC was available from A.E. Co.

It is concluded that B.C. Tel's planning for the introduction of ECC systems is influenced by the availability of new products from A.E. Co., that A.E. Co. products have been late in development, and that A.E. Co. does not have an adequate range of ECC products at this time. The next section discusses B.C. Tel's future planning.

5.3 Switching Technology - Future Plans

In 1975 and 1976, B.C. Tel anticipates purchasing a total of 55,000 lines of ECC switching. The actual and forecast lines added, both ECC and SXS, are shown in Table 3:

9/ Manufactured under license from Western Electric.

Table 3: Actual and Forecast Line Additions

	1970	1971	1972	1973	1974	
ECC	-	6,100	800	1,400	7,800	
SXS	55,300	55,000	47,800	51,800	81,000	
	1975	1976	1977	1978	1979	1980
ECC	19,200	36,000	77,000	78,000	95,000	90,000
SXS	74,200	96,000	46,000	29,200	n/a	n/a

The major vehicle for switching in B.C. Tel is still SXS equipment, accounting for 73 per cent of B.C. Tel purchases of switchgear in the period 1970-74, as compared with 22 per cent for CTCA[9a]/ as a whole. Heavy B.C. Tel purchases of SXS are committed until the end of 1976 due to the lead time in central office provisioning. Equipment for ECC installations up to the end of 1976 is also on order, consisting mainly of three additional #1 EAX machines, to be installed in Prince George, Victoria CL, and Mutual #2. The company has advised that "Proceeding with the remainder of the five-year plan is dependent upon the availability of capital and the financial state of the company after 1976. The outcome of our present rate application will affect our ability to proceed with the ECC conversion plan."

A number of new designs being developed by A.E. Co. in the United States and Canada feature prominently in B.C. Tel future plans. These are listed and described briefly in Appendix 4.

The new products indicate that A.E. Co., principally in the United States and also in Canada, is making a determined effort to catch up so as to have a complete size range of ECC products available. However, they will be doing so in a strongly competitive environment. Furthermore, A.E. Co.'s ability to develop products particularly suited to Canadian needs appears to be subordinate to the priorities of the parent, GTE International Inc., as the cancellation of the MSS/LX development illustrates[10]/.

9[a]/ Canadian Telecommunications Carriers Association - its members operate 99 per cent of Canada's telephones

10/ See Appendix 4

B.C. Tel plans for electronic switching call for an increase from 6.6 per cent of local lines in 1976, the amount now committed in the construction program, to 29 per cent of local lines in 1980 and 45 per cent of local lines in 1985. This plan is ambitious. It is to some extent dependent upon the availability of #2 EAX in 1978 at a favourable price, and it assumes that A.E. Co. will remain the prime source for B.C. Tel switching equipment. Price and availability data before regular production are often unreliable, adding one element of uncertainty to the B.C. Tel plan.

B.C. Tel's installation of ECC at Oak Bay, Mutual, Fairfax and Steveston[11/], and the plans for future conversions as far as they are known, indicate that the company will rely on A.E. Co. for ECC equipment. At present, the #1 EAX is used exclusively; there is reasonable doubt that it was the best choice for Oak Bay and Steveston in view of the lower traffic and smaller size of these offices. There is no indication that B.C. Tel plan to use an economical medium-size machine until the #2 EAX is available from A.E. Co.

In waiting for new switching developments, B.C. Tel are still following the pattern of postponement indicated by the 1959 decision, when crossbar was rejected on the basis that superior electronic designs were pending. Given the increasing rate of technological change, there is no escape from this dilemma for any telephone company. For example, once #2 EAX is introduced the digital switcher, forecast for the early 1980's, will be on the horizon, and inevitably it will offer advantages in PCM trunking, subscriber loop plant and data transmission. Although 1975 is 16 years removed from 1959 the position of B.C. Tel appears to remain unchanged: modernization of the network is still dependent upon the availability of A.E. Co. products.

11/ B.C. Tel's fourth #1 EAX installation, in service date July 1975.

6. INTERCORPORATE FINANCIAL TRANSACTIONS

6.1 Corporate Financial Structure

B.C. Tel, as noted earlier, is one of the GTE family of firms. GTE holdings in Canada can be categorized as part of either a regulated arm, consisting of B.C. Tel (with its subsidiaries) and Quebec Tel, or an unregulated arm consisting of Automatic Electric, Lenkurt, and Dominion Directory. GTE in Canada, through its wholly-owned Quebec-incorporated subsidiary, Anglo-Canadian, has maintained only a controlling interest in firms in the regulated arm (i.e. holding not much more than 50 per cent of the common stock) and has retained ownership of all equity of firms in the unregulated arm. Chart 1, Appendix 5, depicts these arrangements in graphic form.

B.C. Tel's parent, Anglo-Canadian, owns 100 per cent of the unregulated Dominion Directory, and formerly owned 100 per cent of CT&S, bought in 1973 by B.C. Tel and now a B.C. Tel subsidiary. The financial flows among these affiliates, and between these various companies and other GTE subsidiaries, are of two kinds: payments made in respect of purchases of goods and services, and payments associated with the financial structure of the system, such as dividend payments. These payments are discussed below.

6.2 Intercorporate Financial Flows

6.2.1 Anglo-Canadian Telephone Company

On the basis of dividend income generated, as shown in Table 4, B.C. Tel is clearly the most important of Anglo's subsidiaries, providing 64 per cent of Anglo's total dividend income in 1972 and 1973, and 70 per cent in 1974.

Table 4: Amount of Anglo's Dividend Income Provided by:

	1974	1973
	- per cent -	
B.C. Tel	70	64
Quebec Tel	17	17
Cia. Dominicana de Telefonos	8	10
Dominion Directory	5	8
York Investment	-	-
Canadian Telephones and Supplies*	-	1

* Sold to B.C. Tel in 1973

Anglo-Canadian has not paid dividends to its GTE parent since 1966, so that GTE corporate practice during the last nine years has been neither to inject additional funds into the sub-system which Anglo heads, nor to withdraw funds from it.

Anglo has used the dividends from its subsidiaries to purchase portions of the equity issues of its subsidiaries (of which B.C. Tel is by far the largest) sufficient to maintain its controlling interest. Anglo makes use of its financial balances also in the short-term financing of its subsidiaries and for other intercorporate short-term loans. The relationships involved are summarized in Table 5. Given that the sub-system headed by Anglo constitutes a closed financial loop, and given also that B.C. Tel dividends to Anglo since 1966 have been very closely matched with the amount of additional equity investment in B.C. Tel which Anglo has made to maintain its controlling interest, it may be concluded that this relationship has governed in the past (and may govern in the future) decisions regarding both the timing and amount of equity issues by B.C. Tel. Such constraints would represent an additional limitation on the financing activities of B.C. Tel which do not result from the operating activities or profitability of the carrier but are rather a reflection of the reported financial policy of Anglo, as set forth in B.C. Tel's statement to its shareholders in connection with the 1974 amendments to the B.C. Tel Act.

Table 5

Anglo-Canadian Telephone Company: Financial Relations with B.C. Telephone Co.

Cash Dividends from B.C. Tel ($ millions) versus voting control Maintenance Costs to Anglo-Canadian

YEAR	1966	1967	1968	1969	1970	1971	1972	1973	1974
B.C. Tel total dividend payments	6.21	6.60	6.99	8.42	8.98	9.40	10.36	10.30	
Anglo-Canadian received 50.7% of dividends									
Anglo receipts from B.C. Tel	3.15	3.35	3.54	4.27	4.45	4.81	5.25	5.25	
Cumulative receipts from B.C. Tel to Anglo	3.15	6.50	10.04	14.31	18.76	23.57	28.82	34.07	
Common Stock Purchases value if 50.7% maintained	-	-	-	8.76	-	10.26	-	-	11.8
Common Stock purchases value - cumulative				8.76		19.02			30.82

Notes: Anglo-Canadian has paid no dividends since 1966.

Anglo has idle cash from B.C. Tel dividends in several of the years shown. In 1970, Anglo loaned $5 million to B.C. Tel and was repaid in 1971 when the stock issue was made and taken up. Also in 1973 Anglo loaned $3.5 million to B.C. Tel and was repaid in 1974 when the stock was taken up.

6.2.2 Dominion Directory Company

B.C. Tel's payments to Dominion Directory are the principal source of the dividends paid to Anglo by Dominion. Dominion is a very profitable operation and continues to be so despite several reductions in the rate of commission paid to it by B.C. Tel. Dominion currently provides yellow-page marketing services for B.C. Tel, Okanagan Telephone and Quebec Tel. The company also bids on other directory services contracts as the opportunity arises. As Table 6 indicates, B.C. Tel business clearly dominates Dominion's activities.

Table 6: Dominion Directory Revenues per Client as a Percentage of Total Revenues (1973)

B.C. Tel	91.2
Okanagan Tel	4.6
Quebec Tel	3.7
City of Prince Rupert	.5

Under the 1974 contractual agreement between Dominion and B.C. Tel, Dominion sells and compiles yellow-page advertising for all B.C. Tel directories. In addition, Dominion provides technical assistance and advice on matters relating to printing and paper costs, directory format, selection of paper stock, type style, directory coverage and advertising rates. As agent for B.C. Tel, Dominion bids on and negotiates contracts for the supply of paper and other materials and for the printing of all directories.

Under the current pricing agreement between B.C. Tel and Dominion, Dominion receives 22 per cent of gross directory advertising billings, not including revenue from the sale of extra books, and minus advertising uncollectibles. The present 22 per cent figure is lower than in previous years, the reductions having been negotiated initially on the basis of recommendations made by the CTC at rate hearings in 1971, but having been continued recently on the initiative of B.C. Tel. The effect of the reduction in the commission to 22 per cent was to reduce the absolute size of the payment made to Dominion in 1974, compared to 1973, despite a 20 per cent increase in gross advertising revenues in 1974.

The annual rate of return on owner's invested capital in Dominion is very high, averaging about 83 per cent over the period 1969 to 1974 and exceeding 100 per cent in 1971. The reduction in net income and rate of return in 1973 and 1974 is directly attributable to the new pricing arrangement referred to above. There appear to be grounds for the regulator to consider whether Dominion, which depends almost exclusively on B.C. Tel for its profitability, should be incorporated into the regulated arm.

6.2.3 GTE Service Corporation

B.C. Tel receives valuable information from the Service Corporation, a U.S.-based entity, on matters relating to plant, engineering and traffic operations. In other areas the information provided may be considerably less valuable. Overall, it is difficult to say that B.C. Tel has not been receiving "fair value" for its money, or that it has.

The present pricing arrangement with the Service Corporation is not related directly to the value of services provided. Instead, the total expenses of the Service Corporation are allocated to two groups, the first consisting of operating telephone systems served by the Corporation, the second consisting of other GTE affiliates including, for example, GTE Automatic Electric, GTE Lenkurt, and in Canada, Anglo-Canadian. The allocation of costs between the two groups is based upon the time spent in providing services to each. The determination of the amount charged to each telephone company is based on the ratio of each company's total operating expenses and taxes to the total operating expenses and taxes of all such telephone companies.

B.C. Tel, as a Canadian company, receives special consideration in that it is not required to pay any portion of the expenses of the Service Corporation which relates to service matters not applicable to a company providing service in Canada. This has had the effect in recent years of

reducing the prorate base for B.C. Tel by about 25 per cent. Nevertheless, the pricing arrangements are still not sufficiently identifiable with the services provided. A successful outcome to B.C. Tel's current attempt to renegotiate its arrangements with the Service Corporation along lines which would relate payments more closely to services provided would constitute an improvement.

6.2.4 GTE Data Services Corporation (GTEDS)

GTEDS, incorporated in Delaware and 100 per cent owned by GTE, provides on a contractual basis various computer and data processing services to telephone subsidiaries of GTE. In January 1969, B.C. Tel and GTEDS reached an agreement whereby B.C. Tel was entitled to purchase computer programs and related services considered useful for its operations. In essence, the agreement represented an offer by GTEDS to develop computer software packages which B.C. Tel could accept from time to time by the signing of "Attachments" to the agreement. In June 1970, B.C. Tel agreed to share GTEDS' expenses in developing what is called the Business Information System (BIS) whereby GTEDS would carry out the study, design, programming, documentation, testing, and installation of a computer system to enhance each telephone operating company's customer service capacity and provide improved management controls over each company's operations. An attachment to the original agreement was signed specifying that B.C. Tel, along with all other participating GTE telephone companies, would each pay a pro rata share of GTEDS' costs of developing BIS based on relative operating expenses and taxes, with the further provision that B.C. Tel did not have to pay any portion of the expenses relating to matters not applicable to an operating company in Canada.

However, following a ruling by the Department of National Revenue in February 1972, which imposed a combined 34.4 per cent duty and tax on the importation of computer software (which was never made effective and subsequently rescinded) B.C. Tel negotiated a replacement for the

original agreement. A new agreement was signed in March 1973, whereby B.C. Tel is entitled to use its previous payments to GTEDS - amounting to $2.8 million - to purchase desired computer programs at prices specified by GTEDS. Up to the present time, about $2 million of this credit has been expended. Payments to GTEDS rose sharply between 1969 and 1971, and fell slightly in 1972. During this period, payments for computer programs to non-GTEDS sources were relatively small. With the termination of the original GTEDS agreement in 1973, payments to GTEDS dropped sharply in 1973 and only nominal amounts for time-sharing facilities were paid to GTEDS in 1974. Although payments to non-GTEDS sources rose considerably in 1974, total payments for computer software have declined substantially since the agreement was terminated. It would appear that the revised arrangement with GTEDS has to the present brought cost savings to B.C. Tel.

6.2.5 Canadian Telephone & Supplies Ltd. (CT&S)

CT&S is a wholly-owned subsidiary of B.C. Tel, having been purchased by the carrier from Anglo in 1973. This was done as a result of a recommendation by the CTC following the 1971 rate hearings.

CT&S is a contractor for the installation, removal, testing and rearrangement of central office and large PABX equipment. It also operates a shop for the fabrication and repair of iron, wood, and plastic products such as equipment racks for mounting central office equipment, telephone booths, displays, portable central office equipment buildings, and similar items. Until the transfer of ownership, CT&S depended on B.C. Tel for nearly 90 per cent of its revenue. Under the arrangement as it existed, CT&S profits flowed as dividends to the common parent, Anglo-Canadian. Over the period from 1965 to 1972 CT&S was, on a rate of return basis, a very profitable company, the after-tax rate of return on invested capital averaging over 30 per cent and reaching levels of 36 per cent and 35 per cent in 1970 and 1971, respectively.

With a payout ratio of 97 per cent in 1965, 41 per cent in 1966, and an average of 88 per cent thereafter to 1972, CT&S paid dividends to Anglo amounting to more than $1.5 million over the entire period. In addition, it should be noted that the payout ratio for 1973 was, in effect, over 120 per cent, since CT&S net income after taxes for the five months to May 31, 1973, was $51,875.00.

The effect of the transfer of ownership has been to create a situation in which the returns earned as a result of CT&S activity are now retained within the regulated arm. Thus, the 1973 change has been beneficial to the B.C. Tel subscriber, in that these earnings now contribute to the overall returns of the carrier. The action of the CTC, taken because CT&S earnings depended so closely on the operations of B.C. Tel, reflected recognition of the impact on the carrier's overall revenue requirements of the separate corporate existence of CT&S in the unregulated sector.

6.2.6 Automatic Electric and Lenkurt

Approximately 20 per cent of B.C. Tel gross revenues during the years 1970 to 1974 were utilized for purchases from A.E. Co. A further 3 per cent went to Lenkurt.

A discussion of the nature of the purchases relating to these transactions has already been presented. The rates of return reported below indicate that the operations of A.E. Co., with which Lenkurt's results are consolidated, have been very profitable. These profits, of course, reflect sales of equipment to purchasers other than B.C. Tel and include the dividends received from Lenkurt, which also reflect sales to non-B.C. Tel customers.

However, as is customary practice in a parent-subsidiary relationship of any kind, other financial flows to the parent corporation and to affiliates in the United States also occur. They include payments for components imported for assembly in Canada, and payments on account of

royalties, export commissions, administration fees, interest on borrowed funds, advertising, and engineering services. In the case of the present inquiry, these "secondary" flows are beyond the terms of reference and not discussed in this report. However, it was noted that the total of these payments by A.E. Co. during the years 1966 to 1974 represented over 12 per cent of A.E. Co. sales. In the case of Lenkurt the figure has been considerably higher. There is no evidence as to whether these payments represent additional net costs which, by adding to total revenue requirements, have an eventual unfavourable impact on subscriber rates, or whether they represent net benefits advantageous to the subscriber.

6.3 Rates of Return: B.C. Tel and Affiliates

Chart 1, Appendix 5, as noted, illustrates the corporate structure in terms of the regulated and unregulated arms. The telephone operating firms (B.C. Tel, Okanagan Tel and Quebec Tel) constitute the regulated arm while the telephone manufacturing and service firms (A.E. Co., Lenkurt, Dominion Directory) comprise the unregulated arm.

Rates of return[12]/ on the common equity in each of these arms and on the combined GTE investments in Canada were calculated and compared with returns to other participants in these industries and to other industries in Canada for the ten-year period from 1965 to 1974. The results obtained are set forth in Table 6-1, Appendix 6. This table reveals that tax-paid rates of return in the GTE family in Canada have been higher than those in the Bell family in Canada in each of the past ten years. This has reflected principally the higher return on equity earned in the GTE unregulated arm than that earned by the Bell unregulated arm. A number of factors contributed to the lower rates recorded by the Bell subsidiaries during these years, compared either to GTE in Canada; to other communications equipment manufacturers; or, to the all-industry average.

12/ These rates of return do not specify what proportion of profits is reinvested and what proportion is paid in the form of dividends to the parent.

However, it may also be noted that Bell's investments in its various "unregulated" subsidiaries are included in the Bell rate base. Furthermore, Bell's direct ownership of its manufacturing and research subsidiaries is in sharp contrast to the GTE corporate structure discussed in this review. These are two fundamental differences between the Bell situation and that represented by GTE.

These facts and the earlier discussion indicate that an important contributing factor to the relatively high tax-paid rate of return on GTE equity in Canada is the exclusion of a large part of the integrated operation from the regulated sector, with the excluded components enjoying the advantages of the assured market represented by their affiliated regulated telecommunications carrier. In the light of previous analysis, it appears that excessive pricing on the part of unregulated affiliates on their sales to B.C. Tel is not the explanation for the high yield in this sector. Nevertheless, substantial cost savings to the suppliers can occur in such a highly-integrated operation, where the principal or major market is assured. Among these are savings on selling costs and carrying costs on inventory, together with the cost savings associated with security of forward planning of production activity. The telephone company, in its capacity as assured market, could have been expected to share in some degree in the financial benefits arising from the integrated operation. Up to the present B.C. Tel management have not made maximum use, on behalf of the subscriber, of their position of strength as the principal purchaser of A.E. Co. products, although efforts have been made, with growing success, to improve the relationships vis-a-vis the non-manufacturing affiliates. Greater freedom on the part of B.C. Tel management to exercise their management prerogatives might be expected to create conditions in which the benefits of integration would be more equitably shared.

APPENDICES

A.E. Co. Sales to B.C. Tel and Other Customers, By Major Product Category

Table 1-1: A.E. Co. Sales to B.C. Tel in Selected Categories, Expressed as a Percentage of Total Sales

Product	1970	1971	1972	1973	1974
	- per cent -				
Switching - Electronic	43.3	27.4	31.0	74.8	43.4
Switching - SXS	50.3	48.0	70.8	62.6	57.2
Wire and Cable	72.7	76.1	75.4	75.5	74.2
Station Equipment	71.0	69.0	78.1	76.3	66.2
Miscellaneous	38.3	45.1	47.8	46.1	45.0

Table 1-2: A.E. Co. Total Sales by Customer (1970-74 inclusive)

Customer	$ Sales	Per Cent
B.C. Tel[1]	237.7	59.4
Other GTE Affiliates	44.3	11.1
GTE (US)	17.6	4.3
Non-GTE	100.9	25.2
	$ 400.5	100.0

[1] Includes sales to Okanagan Tel.

Table 1-3: A.E. Co. Sales of SXS Equipment, Expressed as a Percentage by Customer

Customer	1970	1971	1972	1973	1974
	- per cent -				
B.C. Tel[1]	50.3	48.0	70.8	62.6	57.2
Other GTE Affiliates[2]	13.0	15.3	14.7	11.3	16.8
GTE (US)	6.5	18.3	0.4	2.2	2.9
Non GTE	30.2	18.4	14.1	23.9	23.1
	100.0	100.0	100.0	100.0	100.0

[1] Includes sales to Okanagan Tel.

[2] Includes Queb Tel, Compania Dominicana, GTE International Columbia.

Table 1-4: A.E. Co. Sales of ECC Switching, Expressed as a Percentage by Customer

Customer	1970	1971	1972	1973	1974
	- per cent -				
B.C. Tel[1]	43.3	27.4	31.0	74.7	43.4
Other GTE Affiliates[2]	17.2	2.1	-	6.3	14.0
GTE (US)	23.0	66.7	32.2	13.1	2.9
Non-GTE	16.5	3.8	36.8	5.9	39.7
	100.0	100.0	100.0	100.0	100.0

[1]Includes Okanagan Tel.

[2]Includes Quebec Tel and Compania Dominicana.

Table 1-5: Wire and Cable - A.E. Co. Sales Distribution 1970-74

Customer	1970	1971	1972	1973	1974
	- per cent -				
B.C. Tel[3] [4]	72.7	76.1	75.4	75.5	74.2
Other GTE Affiliates[1]	14.0	16.0	14.6	15.6	16.3
Non-GTE[2]	13.3	7.9	10.0	8.9	9.5
	100.0	100.0	100.0	100.0	100.0

Total Sales 1970-74 inclusive - $104 million (FST incl.)

[1]Mostly Quebec Telephone and Compania Dominicana.

[2]Mostly domestic sales to smaller carriers and miscellaneous customers.

[3]Includes Okanagan Tel.

[4]Sales to B.C. Tel include about 10% Canada Wire and Cable products in 1973-74 and 5% in 1972.

Table 1-6: A.E. Co. Sales of Station Equipment, Expressed as a Percentage by Customer

Customer	1970	1971	1972	1973	1974
	- per cent -				
B.C. Tel[1]	71.0	69.0	78.1	76.3	66.2
Other GTE Affiliates[2]	2.6	2.7	5.1	6.0	4.0
GTE (US)	6.2	10.6	0.8	1.3	1.4
Non-GTE	20.2	17.7	16.0	16.4	28.4
	100.0	100.0	100.0	100.0	100.0

[1]Includes Okanagan Tel.

[2]Includes Quebec Tel and Compania Dominicana.

Distribution of Lenkurt Sales to B.C. Tel and Other Customers

Table 2-1: Lenkurt Distribution of Sales on Percentage Basis by Customer

Customer	1970	1971	1972	1973	1974
			- per cent -		
B.C. tel	21	21	30	25	23
Other Major Telcos	25	23	23	31	40
Other Domestic	33	25	17	18	17
Export	20	30	29	26	20

Total 5-year Sales - $131 million (FST & PST excluded).

Table 2-2: B.C. Tel Purchases of Equipment from Lenkurt in Major Product Categories as a Percentage of Total Purchases

	1970	1971	1972	1973	1974
			- per cent -		
Microwave Radio	45	45	37	39	26
Radio Multiplex	100	100	100	100	100
PCM Carrier	100	64	71	85	89
Miscellaneous	30	47	43	52	61

Existing Switching Technology Utilized by B.C. Tel

Dates of introduction refer to Canada.

Local Switching

SXS: This is the famous Strowger switch which has been the mainstay of telephone switching since 1900. It is inexpensive, adaptable to all size ranges, and can be modified for some of the newer features. B.C. Tel obtain all their requirements from A.E. Co., who manufacture the equipment at Brockville.

C1 EAX: A small electronic office developed and manufactured in Canada by A.E. Co., introduced in 1971 and widely sold in the domestic and U.S. markets. Nominal capacity of 4800 lines/trunks.

Toll or Combined Local/Toll Switching

1 EAX: A U.S. electronic design manufactured in Brockville except for the central processor and certain components which are imported. Introduced in 1974, 40,000 line nominal capacity. Arranged for Custom Calling Features, Touch Calling, LAMA, CAMA and other new services. First three B.C. Tel installations at Mutual, Fairfax and Oak Bay in 1974-75.

5 XB: An AT&T Crossbar design of 20,000 line nominal capacity manufactured by Northern Electric and introduced in 1956. Partial unit installed in 1972 (Vancouver-Mutual office) to provide Centrex, WATS and other special services not available on A.E. Co. equipment. No future installations planned.

SP-1: An electronic office of 20,000 line nominal capacity designed and manufactured by Northern Electric, introduced in November 1971. To be installed in Mutual in 1976 to augment the Centrex, WATS and TWX, provided by 5 XB. No other installations planned.

Toll Switching

SXS, FW1: A 2 or 4-wire Strowger system with limited code translation, manufactured by A.E. Co. in Canada. Of declining importance, growth accommodated by reused equipment. Few new purchases planned.

/...2

4A TSS: A 4-wire Crossbar machine of AT&T design manufactured by Northern Electric. Introduced in 1954 - Mutual Class 2 office installed in 1971. No other B.C. Tel installations planned.

1 XPT: A 2 or 4-wire common control system of 12,000 trunk capacity manufactured by GTE (U.S.) and imported by A.E. Co. First in-service at Prince George in 1973. No other B.C. Tel installations planned.

Future Switching Technology Considered in B.C. Tel Planning

# 2 EAX	A U.S. design ECC system, 20,000 lines local switching and the first A.E. Co. machine to provide Centrex. First U.S. office to be installed in 1977; first B.C. Tel office 1978 in Victoria.
#3 EAX	A U.S. design ECC digital trunk switcher intended primarily for toll applications. First U.S. installation 1979. Should have a local tandem application in Vancouver area, as well as toll. Will supersede 1 XPT.
MSS/LX	Modular Switching System/Local Exchange. An 8,000 line local office designed by A.E. Co. in Canada as a replacement for the C1 EAX. The first installation scheduled for Dallas, B.C. in 1976 has been abandoned since A.E. Co. have suspended the development of this system[1]/.
MSS/TS	Modular Switching System/Traffic System. Provides Traffic Service Position System (TSPS) features for small installations up to 60 operator positions. An outgrowth of the MSS/LX, using common components[2]/
BSM	Business Service Module. A U.S. designed digital system for PBX and Centrex applications. First installation tentatively planned for 1978 in the United States.

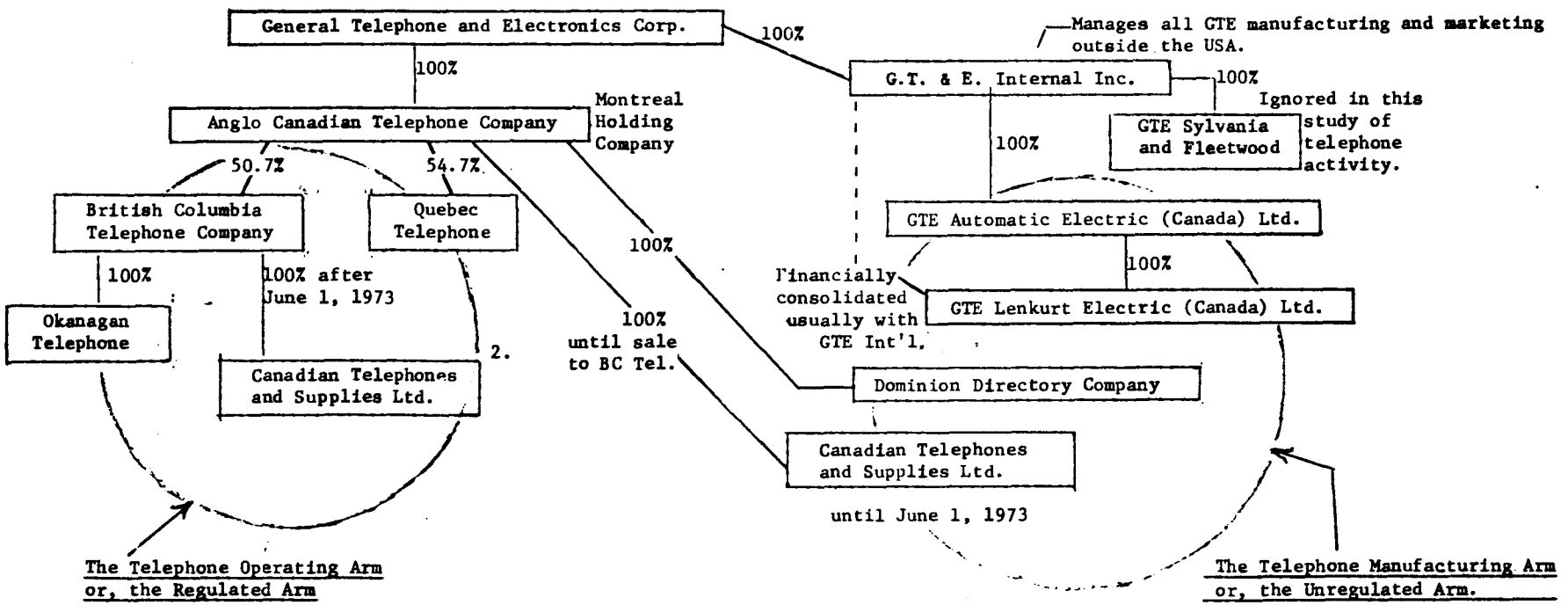
1/ The MSS/LX was being considered by B.C. Tel at the commencement of the Inquiry in April 75, but A.E. Co. abandoned development in May 75, based on marketing advice from GTE International.

2/ The MSS/TS development will continue, but some reworking of the design is required, which should not affect the scheduled introduction date.

Chart - 1

G.T. & E. Holdings in Canada. (Simplified.)

The Regulated Arm and the Unregulated Arm: Equity control noted. [1.]



Notes:
1. The higher-yielding (rate of return) manufacturing firms are always 100% equity controlled by GT & E while the lower-yielding regulated operating firms have just enough GTE equity for assured continuing control.
2. CTC forced the sale of Cndn Tel. Supplies Ltd. to a regulated part of the GTE family in mid-1973.

APPENDIX 5

Table 6-1

Comparison of Tax-paid Rates of Return on Common Equity[1].

GT & E Unregulated Arm)
and GT & E Regulated Arm) versus (- all Industries[2]: Canada, (About 230,000 firms)
and all GT & E Equity[3] in Canada) (- Communications Eqpt. Mnfrs., (About 140 firms)
(- Northern Electric (Bell, Unregulated Arm)
(- Bell Canada Unconsolidated (Bell Regulated Arm)
(- All Bell Equity (including Northern Electric holding).

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	Arithmetic Average (1965-74)
1. GTE Unregulated Arm[6.]	23.5	20.8	19.0	14.8	11.5	14.6	12.5	11.4	18.0	21.8	16.8
2. Bell Unregulated Arm[7.]	8.8	8.8	1.7	6.6	6.8	2.3	6.9	10.7	14.6	20.3	8.7
3. Communications Mnfrs.[4,5.]	13.3	12.7	6.4	8.1	8.6	2.3	5.1	6.5	n.a.	n.a.	(1965-72) --- 7.9[5.]
4. All Industries, Canada[4]	9.2	10.7	10.3	10.1	10.0	8.1	9.6	n.a.	n.a.	n.a.	--- (1965-71) 9.7
5. GTE Regulated Arm	10.0	9.7	9.8	10.1	10.4	9.6	9.8	11.1	10.3	9.2	10.0
a British Columbia Telephone Co.	9.9	9.5	9.5	10.1	10.1	9.4	9.6	10.5	9.5	9.0	9.7
b Quebec Telephone Co.	14.1	11.1	11.9	11.4	11.6	12.2	13.6	15.0	14.1	12.1	12.7
6. Bell Regulated Arm	7.9	7.7	8.2	8.4	7.8	8.5	8.8	9.4	10.0	9.6	8.6
7. All GTE Equity in Canada	13.2	12.5	12.2	11.3	10.7	10.8	10.4	11.2	12.0	12.2	11.7
8. All Bell Equity in Canada	7.7	7.5	7.4	8.1	7.5	7.8	8.5	9.5	10.5	11.1	8.6

Notes:
1. Common equity is mid-year basis.
2. "All Industries" includes Crown and municipal corporation in 1970 and later. That inclusion probably raises The Return by half percent in depression years, by about 0.2 percent other years.
3. Sylvania and Fleetwood not included because quite unrelated to telephone activity of GTE.
4. Assuming average dividend rate 5 percent for preference and preferred stock.
5. It seems likely that the population in SIC #335 underwent sharp change between 1966 and 1967 causing sharp change in equity structure and in rate of return performance. Such a population change can occur through "Major Activity" shift for firms, causing reclassification. Probably the 1965 and 1966 results are unduly favourable and average performance for this group is not as good as even the 7.9 average suggests.
6. See Appendix 5.
7. Northern Electric (Consolidated) Company.