REVISING THE RATIONALE FOR THE TARIFF OF RADIO STATION FEES

A Feasibility Study

Economic Policy and Statistics
JULY 1976

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1 INTRODUCTION

This study has its roots in a number of relatively recent events. Consideration of the X-Budget by Treasury Board in the summer of 1973 brought about a request that the Department of Communications increase its revenues through a revision of the tariff of radio station fees. In the following fiscal year, 1974-75, the additional cash derived from new licensees was sufficient to meet the Board's revenue target but in 1975-76 new targets required an upward revision in the radio station tariff to yield an initial increment of approximately one million dollars.

Under Section 6(1) of the Radio Act, DOC submitted a proposal to Cabinet in the spring of 1975 to increase all radio license fees by 30 per cent. Approval was granted by Order in Council P.C. 1975-581, 18 March, 1975, and the higher rates became effective on 1 April, 1975. But, subsequently the Cabinet issued a directive which stated, in part:

> *2) The Minister of Communications should examine the feasibility of re-adjusting the radio licence schedule in such a way as to reflect the revenue producing capability of the holder of the licence, and report back to Cabinet in due course.*

DGTR convened a meeting of DOC officials on 13 June, 1975 to initiate work in response to this directive. DGTR suggested, at that time, that the criterion mentioned by the Cabinet should not preclude an examination of other rationale for the radio station tariff. An initial effort was directed towards allocating spectrum administration costs by service category but eventually, DGEPS was asked to prepare a comprehensive work proposal. The resultant outline was discussed by DGTR and DGEPS in November, 1975 and work was to proceed with a suggested time constraint of some six months.

2 OBJECTIVES OF STUDY

At the outset, both the boundaries and objectives of this study need to be underscored. The report focuses on the current radio station tariff and possible revisions in its basic rationale. By way of contrast, licence fees assessed and collected by the CRTC are not examined, although it is known that CRTC has been proceeding with its own revision to the broadcasting licence fee schedule. It may be that these two licence fee studies, one by DOC and one by CRTC, should be co-ordinated and assessed jointly before any report is made to Cabinet.

With this caveat, the objectives of this study can be stated as follows:

1) to discuss in conceptual terms possible functions which may be embodied in the re-design of the radio station tariff.

2) to describe the characteristics of the past and current radio station tariff, its basic functions and recent results in terms of the revenues and costs associated with DOC spectrum management.

3) to evaluate both the desirability and feasibility of three alternative revisions in the radio station tariff including:

a) the modification of the tariff using the proportionate costs of processing licence applications and inspecting stations for each service category to establish new relative licence fees;

b) the adjustment of radio station licence fees to reflect the revenue producing capability of the holder of the licence;

c) the adoption of a user charge for licences based on some measurement of actual usage of the radio spectrum

3 WHY LICENCE FEES AT ALL?

It is instructive, at the beginning, to ponder a few conceptual questions. Why licence radio stations at all? What functions can be served by license fees? How might these functions be best reflected in the licence fee structure?

The radio spectrum is a resource which must be allocated among competing usages and users because it is not limitless and anyone's use of it potentially affects its use by others. Generally speaking *rights to use* rather than *rights to own* the radio spectrum are allocated among users with proprietary rights being retained by national governments.

Conceptually, three broad allocative approaches can be usefully distinguished. First, spectrum could be allocated through a market mechanism by which individuals could exchange exclusive transferable rights. Second, allocative coordination could be achieved by means of stipulated rules which could not be legally altered by private arrangement. Third, allocation might take the form of administrative discretion accomplished by centralizing rights to spectrum use and making the rights non-transferable. These approaches are not mutually exclusive. At the present time in Canada, allocation of the spectrum combines administrative discretion with enforcement of stipulated rules.

In more concrete terms, the allocation of radio spectrum in Canada is achieved through the granting of licenses to applicants to transmit on an assigned frequency within the appropriate band (as defined in the regulations of the International Telecommunications Union). Successful applicants are subject to technical standards which apply primarily to equipment or other inputs used in transmission and to some output characteristics (e.g. maximum allowable deviation about the assigned frequency is regulated by standards). In most cases, spectrum users pay an annual fee for each station licence but this fee plays a negligible role in the allocative process as currently practiced.

These procedures have considerable merit. The denial of enforceable rights to users allows for the exercise of considerable discretionary administrative control by the licensing authority. Moreover, many observers would argue that re-arrangements of spectrum rights under the current centralized licensing authority is less costly than it would be if users owned those rights. On the other hand, denying these rights has a clear disadvantage. Spectrum administrators are unable, at a reasonable cost, to discriminate between high and low-valued users. Access to the spectrum tends to become *essential* to all who place a positive value on this means of communication. Therefore, the licensing authority resorts to the practice of block allocation. From time to time, this approach yields inefficient congestion within particular blocks with no criteria to ration the demand for frequency assignments.

Eventually, in cases of severe frequency shortage the present institutional arrangements, internationally and nationally, may reallocate the blocks of spectrum space, but this process is subject to time lags in the order of 10 years.

To reiterate, up to the present time the Canadian allocation procedures have granted a very minor role to licence fees. In principle, price could be an effective instrument to encourage efficient utilization of bandwidth, to discourage redundancy in spectrum assignments, to encourage user research and development, and to create an environment in which potential users carefully consider alternatives to spectrum utilization. In practice, fees are nominal amounts which play little, if any, part in the spectrum allocation and management process. Therefore, although licensing radio stations is essential for the current mode of administrative regulation, the annual fee for each licence is an incidental rather than integral element in this spectrum allocation process.

Of course, alternative allocation procedures have been proposed which would augment the allocative functions of the licence fees. The most radical

departure from the existing allocation mode would involve establishing exclusive transferable spectrum property rights and thereby create a market with prices becoming a strategic factor in the process.* A modest reform of the current institutional arrangements would involve adapting licence fees in order that they become more like a rental charge for spectrum use than a nominal annual fee for a licence.

Two of the three alternative fee schemes discussed in this study hold potential for increasing the allocative role of the radio station tariff; the third proposal, while revising the licence fee rationale, does not envisage these fees as an integral part of the allocation process. None of the alternative fee schedules in this study is a proxy for a full-fledged market approach.

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* The case for or against these arrangements is not detailed in this study. A good reference is: Harvey J. Levin, The Invisible Resource, Use and Regulation of the Radio Spectrum, The John Hopkins Press, 1971.

4 CHARACTERISTICS OF RADIO STATION TARIFF AND RESULTANT REVENUES

Before discussing possible revisions in the licensing fees, this section reviews the historical characteristics and rationale for the current tariff; highlights features of the resultant revenues by service category with key anomalies noted; and describes recent trends in aggregate revenues as compared to the total costs associated with DOC radio spectrum management.

(1) Historical Characteristics and Rationale

The history of the tariff of radio station fees is summarized in a tabular form in Appendix A. Based on this information a few observations are offered.

(a) Licence fees were imposed for the first time in 1914 for seven classes of radio stations. From then until 1958 there was no change in the classification scheme, although 14 radio station classes were added and, of these, eight were eventually discontinued. The initial fees for each station class remained constant throughout that time period with a few exceptions. One change is worthy of notice; the fee rationale for the private commercial broadcasting station was modified twice and in 1948 came to be based on annual gross revenue of the broadcasting undertaking. As noted earlier, this rationale is now under review by the CRTC.

(b) In 1958, a major revision took place in the licence fee classification scheme with categories of service replacing the former class of licence as the primary basis for defining the radio station fee structure. Thereby, the number of fee categories expanded from 12 to 31. A number of significant fee increases were also adopted in 1958.

(c) Since 1958 one service category has been discontinued and one added (i.e. General Radio Service), and there have been two general fee revisions, one in 1968 and a second in 1975.

In terms of the tariff's possible rationale three sections in the Radio Act are germane. They read as follows with italics added:

> Section 2(2) Subject to subsection (3) Her Majesty in right of Canada and each province is bound by this act *but nothing herein* provided shall be *deemed to impose or authorize the* imposition by regulation of *a fee* for any licence or certificate issued to Her Majesty *in right of Canada or any province.*
>
> Section 4(1) *The Minister may* (a) *prescribe classes of licenses* and of technical construction and operations certificates; (b) *issue licences in respect of radio stations* and radio apparatus to the extent that they are not broadcasting undertakings,
>
> Section 6(1) *The Governor in Council may* prescribe the *tariff of fees to be paid for licences* and for examination for certificates of proficiency held and issued under the Act.

Clearly, the Radio Act itself prescribes no particular rationale for the tariff apart from the specification that any licence or certificate issued to Her Majesty in right of Canada or any province be exempt from any fee imposition. On the other hand, observing the actual history of licence fees suggests that an implicit rationale has been operative. While the absolute fees have remained quite modest through the years, the relative fee levels have had some rough relationship with the licensee's ability to pay.

For instance, public commercial licensees who use the spectrum in the provision of communication services to third parties pay the highest annual licence fees, whereas hobbyists and experimental users of the spectrum pay the lowest fees.

Other commercial licensees who use spectrum for private communications within their respective organizations pay fees which generally fall between these two broad groupings. Table 1 illustrates this implicit rationale for three specific service categories by showing historical changes in the absolute fee level and by indexing them in relation to the Public Commercial as the base rate. The indices in the table point to a relative decline in the Private Commercial fee and a relative increase in the Amateur Experimental rate in relation to the Public Commercial licence fee.

Table 1 - Absolute Fee and Indexed Fee for Three Tariff Categories

YEAR	Public Commercial*		Private Commercial		Amateur Experimental	
	Absolute	Index	Absolute	Index	Absolute	Index
1914	$ 50	100.0	$ 10	20.0	$ 1	2.0
1924	50	100.0	10	20.0	2.50	5.0
1958	100	100.0	10	10.0	2.50	2.5
1968	150	100.0	20	13.3	10	6.6
1975	195	100.0	26	13.3	13	6.6

* In 1958, 1968 and 1975 the fee for the land class is used for comparison purposes rather than the mobile class.

(2) Features of Current Tariff and Licence Fee Revenues

To highlight features of the current tariff of radio license fees Tables 2 to 5 are presented. In each case, the table is followed by an annotation which draws attention to a few particular points. The format of all the tables was chosen, in part, to reflect the implicit *ability to pay* rationale embodied in the tariff. Hence, all Public Commercial categories are grouped together at the top of each table followed by Private Commercial, Aeronautical, and Maritime categories. The next grouping is for government radio services including the earthspace stations of Telesat, Provincial and Municipal categories. The final grouping picks up the Amateur and Experimental and General Radio Service categories. As a further aid to the reader,

Appendix C includes the service definitions in the radio regulations for each service category listed in Tables 3 through 6. With one exception, these definitions are taken from the General Radio Regulations, Part II (SOR/63-297); the definition for Ship Stations is drawn from the Ship Station Radio Regulations, Part II (SOR/66-261).

TABLE 2

Current Radio Station Licence Fees (effective 1 April 1975)

SERVICE CATEGORY	LAND	COAST	MOBILE	SHIP	EARTH	SPACE
PUBLIC COMMERCIAL	$195.00		$46.00			
RESTRICTED PUBLIC COMMERCIAL	130.00					
PUBLIC COMMERCIAL AUTOMATIC REPEATER	98.00					
PUBLIC COMMERCIAL RECEIVING	20.00		20.00			
PRIVATE COMMERCIAL	26.00		10.00			
PRIVATE COMMERCIAL AUTOMATIC REPEATER	13.00					
PRIVATE COMMERCIAL RECEIVING	13.00					
AERONAUTICAL MOBILE	26.00		20.00			
AIRCRAFT NAVIGATIONAL			13.00			
LIMITED MARITIME MOBILE		98.00				
PRIVATE MARITIME MOBILE		26.00				
SHIPS TRANSMIT & RECEIVE				20.00		
SHIPS - RECEIVE				13.00		
SATELLITE RELATED					no fee	no fee
PROVINCIAL	no fee		no fee			
MUNICIPAL	13.00		13.00			
EXPERIMENTAL	26.00		13.00			
AMATEUR EXPERIMENTAL	13.00					
AMATEUR EXPERIMENTAL REPEATER	13.00					
GENERAL RADIO SERVICE	4.50					

As suggested earlier, the highest fees have usually pertained to those licensees who derive revenues by utilizing the spectrum in the provision of services for sale to other entities. This is reflected in Table 3.

Some anomalies in the tariff are obvious in that licensees in neither the satellite related nor provincial government categories pay a fee. Three anomalies are not apparent but need mention. First, within the Public Commercial categories the three prairie telephone companies account for a significant number of the licenced stations, but being provincial government agencies they are exempted from paying the prescribed fee. Second, municipal government systems pay fees but a fleet licensing procedure particularly in the case of mobile stations leads to a substantive discount. For example, a fleet of police cars each with a mobile station is charged as *one* mobile station. Third, all federal government radio stations regardless of their service category are exempt from licence fees.

TABLE 3

Total Licenced Stations and Total Fee Payers (April 2, 1976)

SERVICE CATEGORY	LAND	COAST	MOBILE	SHIP	EARTH	SPACE
PUBLIC COMMERCIAL	1,895 / 1,218		16 / 16			
RESTRICTED PUBLIC COMMERCIAL	720 / 708					
PUBLIC COMMERCIAL AUTOMATIC REPEATER	1,147 / 879					
PUBLIC COMMERCIAL RECEIVING	89 / 69		0 / 0			
PRIVATE COMMERCIAL	30,832 / 26,248		186,826 / 166,915			
PRIVATE COMMERCIAL AUTOMATIC REPEATER	2,182 / 1,670					
PRIVATE COMMERCIAL RECEIVING	561 / 466		169 / 141			
AERONAUTICAL MOBILE	1,632 / 1,436		12,853 / 12,538			
AIRCRAFT NAVIGATIONAL			3 / 3			
LIMITED MARITIME MOBILE		0 / 0				
PRIVATE MARITIME MOBILE		99 / 8				
SHIPS TRANSMIT & RECEIVE				13,281 / 12,612		
SHIPS - RECEIVE				1 / 1		
SATELLITE RELATED					99 / 0	4 / 0
PROVINCIAL	5,881 / 0		29,827 / 0			
MUNICIPAL	4,969 / 1,960		31,575 / 2,205			
EXPERIMENTAL	511 / 361		522 / 416			
AMATEUR EXPERIMENTAL	15,623 / 15,623					
AMATEUR EXPERIMENTAL REPEATER	187 / 187					
GENERAL RADIO SERVICE	157,204 / 157,204					

Table 4 provides an indication of the relative importance of the various categories of service. Some of the defined categories are empty sets (e.g. Public Commercial Receiving-Mobile, Limited Maritime Mobile-Coast, and Ships-Receive apparatus for navigational purposes) while others have a very small number of licenced stations (e.g. Public Commercial-Mobile and Aircraft Navigational-Mobile).

The top five categories of land stations ranked by number of licenced stations are: General Radio Service, Private Commercial, Amateur Experimental, Municipal, Provincial, and Public Commercial. The top five categories of mobile stations similarly ranked are Private Commercial, Municipal, Provincial, Aeronautical Mobile, and Experimental. In the case of coast, ship, earth and space stations, there is only one category in each instance which has any licenced station.

TABLE 4

Percentage of Licenced Stations Which Pay Fees (April 2, 1976)

SERVICE CATEGORY	LAND	COAST	MOBILE	SHIP	EARTH	SPACE
PUBLIC COMMERCIAL	64.3		100.0			
RESTRICTED PUBLIC COMMERCIAL	98.3					
PUBLIC COMMERCIAL AUTOMATIC REPEATER	76.6					
PUBLIC COMMERCIAL RECEIVING	77.5		- nil -			
PRIVATE COMMERCIAL	85.1		89.3			
PRIVATE COMMERCIAL AUTOMATIC REPEATER	76.5					
PRIVATE COMMERCIAL RECEIVING	83.1		83.4			
AERONAUTICAL MOBILE	88.0		97.5			
AIRCRAFT NAVIGATIONAL			100.0			
LIMITED MARITIME MOBILE		- nil -				
PRIVATE MARITIME MOBILE		8.1				
SHIPS TRANSMIT & RECEIVE				95.0		
SHIPS - RECEIVE				100.0		
SATELLITE RELATED					0.0	0.0
PROVINCIAL	0.0		0.0			
MUNICIPAL	39.4		7.0			
EXPERIMENTAL	70.6		79.7			
AMATEUR EXPERIMENTAL	100.0					
AMATEUR EXPERIMENTAL REPEATER	100.0					
GENERAL RADIO SERVICE	100.0					

Table 5 expresses the information in Table 4 in percentage terms.

Although the reasons vary, those categories which contribute no revenues are obvious. Some represent empty sets whereas others (e.g. Provincial, Telesat,s earth and space stations) do not have any fee assigned. Of the remaining categories, all but four have a percentage of fee payers in excess of 75 per cent. The four exceptions are Private Maritime Mobile, Municipal Land and Mobile, and Experimental.

TABLE 5

Revenue Collected versus Revenue Shortfall Resulting from Exemptions ($'000)

SERVICE CATEGORY	LAND	COAST	MOBILE	SHIP	EARTH	SPACE
PUBLIC COMMERCIAL	237.5 / 132.0		0.7 / -nil-			
RESTRICTED PUBLIC COMMERCIAL	92.0 / 1.6					
PUBLIC COMMERCIAL AUTOMATIC REPEATER	86.1 / 26.3					
PUBLIC COMMERCIAL RECEIVING	1.4 / 0.4		-nil- / -nil-			
PRIVATE COMMERCIAL	682.4 / 119.2		1,669.2 / 199.1			
PRIVATE COMMERCIAL AUTOMATIC REPEATER	21.7 / 6.7					
PRIVATE COMMERCIAL RECEIVING	6.1 / 1.2		1.8 / 0.4			
AERONAUTICAL MOBILE	37.3 / 5.1		250.8 / 6.3			
AIRCRAFT NAVIGATIONAL			0.1 / -nil-			
LIMITED MARITIME MOBILE		-nil- / -nil-				
PRIVATE MARITIME MOBILE		0.2 / 2.4				
SHIPS TRANSMIT & RECEIVE				252.2 / 13.4		
SHIPS - RECEIVE				0.1 / -nil-		
SATELLITE RELATED					no / fee	no / fee
PROVINCIAL	no / fee		no / fee			
MUNICIPAL	25.3 / 39.1		28.7 / 381.8			
EXPERIMENTAL	9.4 / 3.9		5.4 / 1.4			
AMATEUR EXPERIMENTAL	203.1 / -nil-					
AMATEUR EXPERIMENTAL REPEATER	2.4 / -nil-					
GENERAL RADIO SERVICE	707.4 / -nil-					

There are two main ways of looking at Table 6. Under current arrangements the top five revenue generating categories are Private Commercial - Mobile ($1,669.2), General Radio Service ($707.4) Private Commercial-Land ($682.4), Ships Transmit and Receive ($252.2), and Aeronautical Mobile ($250.8).

On the other hand, if there were no exemptions in those categories with an assigned fee this ranking by revenue would be changed. It would become Private Commercial-Mobile ($1,868.3), Private Commercial-Land ($801.6), General Radio Service ($707.4), Municipal Mobile ($410.5) and Public Commercial-Land ($369.5). Moreover, of those categories with no assigned fee the Provincial Mobile stations with some 28,500 licenced stations might come to rank highly in terms of revenue generated.

(3) DOC Radio Spectrum Management Aggregate Revenues and Costs

Table 6 shows recent trends in revenues and costs associated with DOC radio spectrum management.

Table 6 - DOC Radio Spectrum Management Revenues and Costs - $000

Fiscal Year	REVENUE			COSTS	SURPLUS or (DEFICIT)
	Broadcasting Fees*	Radio Station Fees	Total		
1970-71	3,939	2,227	6,166	6,076	90
1971-72	3,606	1,725	5,331	7,795	(2,464)
1972-73	3,903	2,608	6,538	9,628	(3,090)
1973-74	4,868	2,977	7,845	10,750	(2,905)
1974-75	5,051	3,597	8,648	13,948	(5,300)
1975-76**	6,344	5,580	11,924	18,760	(6,836)

* Assessed and collected by CRTC but credited in Public Accounts to DOC.

** Estimated for FY 1975-76 (the final figures will be available only after Public Accounts are published).

Source: Cost figures from Public Accounts of Canada, Vol.II for respective years. Revenues figures from DOC financial records.

Although the effect of higher radio station tariffs since 1 April 1975 is evidenced in the table, the deficit for fiscal year 1975-76 is expected to be approximately $6.8 million. Despite a lower rate of growth in the deficit as compared with the previous year, 1975-76 will mark the largest short-fall in a pattern of deficits which began with fiscal year 1971-72. The concerns of Treasury Board which brought about the recent revision in the radio station tariff may be revived in the face of this mounting deficit.

Throughout this study, it is assumed that as a minimum, total revenues from broadcasting and radio station fees should recover the total costs of spectrum management as recorded in the Public Accounts. Actually, there is room for considerable debate over exactly which cost components included in the Public Accounts total (see Appendix B for a breakdown of the 1975-76 total) should be recovered by spectrum licence fees versus general government taxation revenues. This study does not join this debate since establishing the absolute licence fee levels in relation to a total cost deemed suitable is quite straightforward, whereas establishing appropriate and operational criteria for the relative licence fee structure and moving towards spectrum rental charges rather than mere licence fees are clearly more intractable issues.

In other words, there are numerous licence fee designs capable of meeting a chosen revenue requirement (eg. the total of selected spectrum management costs) and in effect, the revision of 1 April 1975 assumed that the prevailing fee structure was acceptable by applying an across-the-board increase of some 30 percent. This procedure could be repeated if additional revenues were required but the Cabinet directive suggests that the licence fee rate design merits examination before such action is taken.

In summary, the spectrum management financial deficit continued to expand quite rapidly in 1975-76 despite the 30 percent increase in all radio station licence fees on 1 April, 1975. But, before any further upward revisions in the tariff of radio station fees are proposed, the Cabinet directive requires that the feasibility of adjusting licence fees to reflect the revenue producing capability of the holder of the licence be evaluated. In the next section, this suggestion plus two other alternative fee schemes are discussed.

5 THE FEASIBILITY OF REVISIONS IN THE CURRENT LICENCE FEE RATIONALE

Assuming that some type of change in the radio station tariff is desirable, revisionists have a basic choice. Either the fee schedule will be adapted with fees becoming an essential element in the allocation of spectrum licences or the existing tariff rationale will be modified to suit the interests of administrative rigour and consistency but, at the same time, keeping the licence fees as an incidental feature in the process of spectrum allocation. Three potential revisions in the licence fee schedule are discussed in this section; the first implies little change in the current allocative mode but the second and third revision hold greater potential for a tariff which will be an integral element in the spectrum allocation process.

One further distinction is useful. The rationalization for the absolute level of fees versus the relative fee structure can differ markedly. As noted earlier, this study assumes, as a minimum, that total licence fee revenues should be sufficient to recover the total costs of DOC's spectrum management activity (subject to the resolution of any debate over the appropriate elements in this total). The alternative fee schemes in this section work within this assumption and therefore, the substantive reforms in the proposed tariffs are evidenced only in the relative fee structures. If the radio station tariff was ever to be an integral part of the allocation process, recovery of total spectrum administration costs might be judged as an inappropriate criterion for the absolute fee levels. This possibility will be illustrated in the three potential tariff revisions which follow.

(1) A Costing Approach as a Benchmark for Relative Fees

As suggested earlier, the prevalent rationale for the absolute level of fees in the tariff of radio station fees appears to be cost recovery. A natural corollary to this thinking is to argue that the relative fee structure be linked to the costs of administering the spectrum.

Considerable effort has been made in this study to develop this approach and simulate possible new fee schedules.

Before discussing the results, a few comments on methodology are presented. Two reports for the Ontario Region in fiscal year 1974-75 were the prime source documents: namely, the Authorization and Examination Report which identifies hours spent processing licence applications by service category, and second, the Inspection and Interference Report which identifies hours spent in the inspection of radio stations by service category. Appendix C illustrates that the Ontario Region is a close approximation of the national distribution of licenced stations by service category. While the definition of Service Categories is provided in the regulations, a considerable divergence of interpretation and application occurs when the same service category titles are used in the field to report time spent in "inspection" and "authorization". For instance when the inspection report shows that 121 hours have been spent in inspecting service category "Land Public Commercial" in Ontario during fiscal year 74/75 then these 121 hours are in fact the result of inspecting <u>some</u> stations in the service categories of Public Commercial, Restricted Public Commercial, Public Commercial Receiving and Public Commercial Automatic Repeaters.

In what follows we describe the methodology in terms of inspection cost alone. The handling of authorization costs is similar, except that the categorization of authorization costs is again different (17 categories rather than 15). This, together with a different type of relation between "authorization categories" and bona fide service categories leads to a numerically and dimensionally different but structurally identical treatment. By adding the unit inspection and authorization costs thus derived we obtain a primary schedule related to administrative costs. The basic methodology used to derive inspection costs by service category proceeded in the following manner.

Let $IC = (IC_1, IC_2, \ldots, IC_{15})$ be the recorded inspection cost (inspection time X wage rate) for the "inspection categories",

and let $SVC = (SVC_1, SVC_2, \ldots, SVC_{29})$ be the bona fide service categories to which the present fee-schedule applies. Furthermore let $n_j^F + n_j^{nF}$ $j = 1,2, \ldots, 29$ be the station population corresponding to SVC, with n_j^F and n_j^{nF} referring to fee-paying and non-fee-paying population respectively.

The objective is to derive a basic fee schedule $F^0 = (F_1^0, F_2^0, \ldots, F_{29}^0)$ corresponding to the service categories so that the total inspection cost will be recovered. This implies that the fee-schedule F^0 must satisfy the equation

$$\sum_{i=1}^{15} IC_i = \sum_{j=1}^{29} n_j F_j^0 \qquad (1)$$

The following system of equations is an expansion of (1)

$$\begin{aligned}
IC_1 &= n_{11} f_{11} + n_{12} f_{12} + \ldots + n_{1,29} f_{1,29} \\
IC_2 &= n_{21} f_{21} + n_{22} f_{22} + \ldots + n_{2,29} f_{2,29} \\
&\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \qquad (2) \\
&\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \\
IC_{15} &= n_{15,1} f_{15,1} + n_{15,2} f_{15,2} + \ldots + n_{15,29} f_{15,29}
\end{aligned}$$

Here f_{ij} is a part of the fee F_j^0 of service category SVC_j, so that

$$F_j^0 = \sum_{i=1}^{15} \frac{n_{ij} f_{ij}}{n_j}$$

while $n_{ij} = p_{ij} \times n_j$ is that number of stations in SVC_j whose inspection cost (time) is reported under inspection category IC_i. The system of equations (2) is subject to a constraint. The incremental fees f_{ij} (i fixed) must be proportional to the time required to inspect radio

stations in different service categories i.e.

$$\frac{f_{ij}}{f_{ik}} = \frac{t_{ij}}{t_{ik}} = m_{i,jk} \qquad \text{for all } jik = 1,2, \ldots\ldots, 29$$

where t_{ij} is the time required to inspect a station in SVC_j relative to the inspection time of a station in any other service category. Matrices (p_{ij}) and (t_{ij}) have been estimated through opinion analysis with the assistance from field personnel. The solution is now imminent. From (2) we have

$$IC_i = n_{i1}\, f_{i1} + n_{i2}\, f_{i2} + \ldots + n_{i,29}\, f_{i,29}$$

$$= (n_{i1}\, n_{i2} \ldots n_{i,29}) \quad (f_{i1}, f_{i2}, \ldots f_{i,29})'$$

$$= f_{ij}\, (n_{i1}\, n_{i2} \ldots n_{i29}) \left(\frac{f_{i1}}{f_{ij}}\ \frac{f_{i2}}{f_{ij}} \ldots \frac{f_{i,29}}{f_{ij}}\right)'$$

$$= f_{ij}\, (n_{i1}\, n_{i2} \ldots n_{i,29}) \quad (m_{i,1j}, m_{i,2j} \ldots m_{i,29j})'$$

Hence

$$f_{ij} = \frac{IC_i}{(n_{i1}\, n_{i2} \ldots n_{i,29}) \quad (m_{i,1j}, m_{i,2j} \ldots m_{i,29j})^{\frac{1}{2}}},$$

and

$$F_j^{\,0} = \sum_{i=1}^{15} \frac{n_{ij}\, f_{ij}}{n_j} \qquad j = 1,2, \ldots, 29$$

Tables 7 and 8 present the results. In both cases, two simulated revisions are given, one which reflects all the current exemptions and another which exempts only the United States Military Service category. Table 7 compares the current tariff with these two revisions assuming total radio station licence revenues for 1975-76 (estimated to total $5,580,000) are generated. Table 8 simulates a second set of revisions assuming that radio station licensees pay a proportion of the anticipated deficit. This proportion was derived using the ratio of radio station licence fee revenues over total spectrum fee revenues for fiscal year 1975-76. Hence, the simulated fees in Table 8 generate total revenues of $8,779,000.

The general thrust of the results is the same in both tables but for purposes of discussion Table 8 is taken as the focus. Relative fees would be distinctly different if based exclusively on those costs which can be readily assigned to various service categories. Land stations in Public Commercial, Restricted Public Commercial and Public Commercial Automatic Repeater display a sharp drop in the licence fee whereas Private Commercial-Land, Private Commercial Automatic Repeater, Aeronautical Service-Land and Mobile and General Radio Service register sharp increases. Observing the second tariff revision in which only one major exemption remained (e.g., U.S. Military Service) one notes, as expected, reductions in virtually all the licence fees ranging from one to ten dollars. Of course, the exception to this rule is provincial government service which moves from total fee exemption and begins to pay a fee for both land and mobile stations.

These results are amenable to other simulations if required but the central strengths and weaknesses of this approach need discussion. Basically, the approach is attractive because it utilizes information available in current records and the notion that fees might be associated with the identifiable costs of processing licenses and inspecting stations can can be appreciated if not generally accepted by

licensees. On the other hand, the approach has a number of weaknesses which are more or less significant. Immediately, it must be recognized that the costs used to establish the revised relative fee structure represent only a small proportion of the total spectrum management costs. Essentially, the residual or common costs are allocated across all service categories in proportion with those costs which are assignable (e.g., application processing and inspection costs). This procedure does not have to be followed, but any other allocation of the common costs requires administrative judgement as embodied in the current tariff. Second, even those cost dollars which can be tagged and assigned to specific service categories reflect the current administrative procedures. Changes in inspection standards, adoption of fleet licensing, utilization of the SMS system will all affect the matrix of costs assigned to each category. In other words, cost information, by no means provides an independent benchmark for licence fees. Third, this cost-based approach includes no particular incentive for the user to economize on his use of spectrum. Finally, one can conjecture that the approach is not *acceptable* because the relative fee structure which results diverges from the implicit *ability to pay* rationale in the current tariff.

TABLE 7

COMPARISON OF CURRENT RADIO STATION FEES
WITH COST-BASED REVISIONS OF THE TARIFF
RECOVERING A PROPORTION OF ESTIMATED DEFICIT FOR 1975/76

	TARIFF CATEGORIES	Fee Paying Population (April 2/76)	Percentage of Total Population %	Present Annual Fee $	Revised Cost-Based Schedule with Existing Exemptions $	Revised Cost-Based Schedule with only One Exemption $
1(a)	Limited Maritime Mobile Service	0	-nil-*	98.00	U.C.	U.C.
(b)	Private Maritime Mobile Service	8	8.1	26.00	2.00	2.00
2(a)	Public Commercial Service	1,218	64.23	195.00	60.00	52.00
(b)	Restricted Public Commercial Service	708	98.3	130.00	61.00	52.00
(c)	Private Commercial Service	26,248	85.1	26.00	103.00	87.00
(d)	United States Military Service	0	-nil-*	no fee	no fee	no fee
(e)	Provincial Government Service	0	6,881**	no fee	no fee	15.00
(f)	Municipal Service	1,960	39.4	13.00	32.00	27.00
(g)	Experimental Service	361	70.6	26.00	21.00	17.00
(h)	Amateur Experimental Service	15,623	100.0	13.00	8.00	7.00
(i)	Public Commercial Receiving Service	69	77.5	20.00	9.00	8.00
(j)	Private Commercial Receiving Service	466	83.1	13.00	16.00	13.00
(k)	Public Commercial Automatic Repeater Service	879	76.6	98.00	29.00	25.00
(l)	Private Commercial Automatic Repeater Service	1,670	76.5	13.00	47.00	40.00
(m)	Aeronautical Mobile Service	1,436	88.0	26.00	71.00	60.00
(p)	Amateur Relay	187	100.0	13.00	8.00	7.00
3(a)	Public Commercial Service	16	100.0	46.00	U.C.	U.C.
(b)	Private Commercial Service	166,915	89.3	10.00	13.00	11.00
(c)	United States Military Service	0	-nil-*	no fee	no fee	no fee
(d)	Provincial Government Service	0	29,827**	no fee	no fee	5.00
(e)	Municipal Service	2,205	7.0	13.00	6.00	5.00
(f)	Experimental Service	416	79.7	13.00	16.00	14.00
(g)	Public Commercial Receiving Service	0	-nil-*	20.00	U.C.	U.C.
(h)	Private Commercial Receiving Service	141	83.4	13.00	2.00	2.00
(i)	Aircraft Navigation Service	3	100.0	13.00	85.00	73.00
(j)	Aeronautical Mobile Service	12,538	97.5	20.00	84.00	72.00
4(a)	Transmitting and Receiving Apparatus	12,612	95.0	20.00	50.00	43.00
(b)	Receiving Apparatus for Navigational Purposes	1	100.0	13.00	U.C.	U.C.
	General Radio Service	157,204	100.0	4.50	11.00	10.00

* There are no licenced radio stations in these categories.

** In these cases, the total number of licenced radio stations is given and all are exempt from payment of a fee.

U.C. - unable to calculate

TABLE 8

COMPARISON OF CURRENT RADIO STATION FEES WITH COST-BASED REVISIONS OF THE TARIFF RECOVERING TOTAL ESTIMATED DEFICIT FOR 1975/76

	TARIFF CATEGORIES	Fee Paying Population (April 2/76)	Percentage of Total Population %	Present Annual Fee $	Revised Cost-Based Schedule with Existing Exemptions $	Revised Cost-Based Schedule with only One Exemption $
1(a)	Limited Maritime Mobile Service	0	-nil-*	98.00	U.C.	U.C.
(b)	Private Maritime Mobile Service	6	6.2	26.00	1.00	1.00
2(a)	Public Commercial Service	1,218	64.43	195.00	38.00	33.00
(b)	Restricted Public Commercial Service	708	98.3	130.00	39.00	33.00
(c)	Private Commercial Service	26,248	85.1	26.00	65.00	56.00
(d)	United States Military Service	0	-nil-*	no fee	no fee	no fee
(e)	Provincial Government Service	0	6,881	no fee	no fee	10.00
(f)	Municipal Service	1,960	39.4	13.00	20.00	17.00
(g)	Experimental Service	361	70.6	26.00	13.00	11.00
(h)	Amateur Experimental Service	15,623	100.0	13.00	5.00	5.00
(i)	Public Commercial Receiving Service	69	77.5	20.00	6.00	5.00
(j)	Private Commercial Receiving Service	466	83.1	13.00	10.00	9.00
(k)	Public Commercial Automatic Repeater Service	879	76.6	98.00	18.00	16.00
(l)	Private Commercial Automatic Repeater Service	1,670	76.5	13.00	30.00	25.00
(m)	Aeronautical Mobile Service	1,436	88.0	26.00	45.00	38.00
(p)	Amateur Relay	187	100.0	13.00	5.00	5.00
3(a)	Public Commercial Service	16	100.0	46.00	U.C.	U.C.
(b)	Private Commercial Service	166,915	89.3	10.00	8.00	7.00
(c)	United States Military Service	0	-nil-*	no fee	no fee	no fee
(d)	Provincial Government Service	0	29,827**	no fee	no fee	3.00
(e)	Municipal Service	2,205	7.0	13.00	4.00	3.00
(f)	Experimental Service	416	79.7	13.00	10.00	9.00
(g)	Public Commercial Receiving Service	0	-nil-*	20.00	U.C.	U.C.
(h)	Private Commercial Receiving Service	141	83.4	13.00	1.00	1.00
(i)	Aircraft Navigation Service	3	100.0	13.00	54.00	46.00
(j)	Aeronautical Mobile Service	12,538	97.5	20.00	53.00	45.00
4(a)	Transmitting and Receiving Apparatus	12,612	95.0	20.00	32.00	27.00
(b)	Receiving Apparatus for Navigational Purposes	1	100.0	13.00	U.C.	U.C.
	General Radio Service	157,204	100.0	4.50	7.00	6.00

* There are no licenced radio stations in these categories.

** In these cases, the total number of licenced radio stations is given and all are exempt from payment of a fee.

U.C. - unable to calculate

(2) Revenue Producing Capability of the Licensee as a Benchmark for Relative Fees

A second alternative fee scheme is implied in the Cabinet directive itself. It suggests that there be an examination of *the feasibility or re-adjusting the radio licence schedule ... to reflect the revenue producing capability of the holder of the licence.* It is the contention of this report that the existing tariff reflects the revenue producing capability of the licensees although the rationale is not explicit nor applied in any rigorous and consistent fashion. For instance, those licensees engaged in the sale of radio services which are open to public correspondence have the highest absolute fees whereas those licensees which engage in non-commercial private correspondence pay the lowest fees and other commercial applications which do not involve public correspondence have fees between these two limits. The most glaring inconsistency in the tariff results from total fee exemption granted to federal and provincial government users (including the three prairie telephone undertakings) and the substantive discount available to municipal government users.

Therefore, although it may be argued that the Cabinet Directive is already embodied in the licence fee structure, there is a temptation to measure the ability to pay in some operational fashion. Initially, the thought of using some measure of revenue, investment or profit carries some appeal but further investigation suggests such measures offer little improvement over the current administrative judgement. In fact, the CRTC experience with gross revenue of broadcasting undertakings as the benchmark for fees provides evidence of some of the inherent difficulties. Over a period of time, it has become difficult to determine what items of revenue to include in the total; it has become inequitable with the fee representing a much larger percentage of profits for a small operator than a larger broadcasting entity; and the procedures have been judged increasingly cumbersome and costly to the CRTC.

For most public commercial licensees (e.g., telephone companies), it is not cost-effective to identify either revenues or investments that might be associated with the use of the radio spectrum. In other words, while one can conceive of spectrum as an input to the licensees enterprise which eventually yields revenue dollars, it is not feasible to establish a quantitative relationship between the spectrum assigned to a licensee and a suitable proportion of final revenues attributable to that input.

For the sake of consistency, if a measure of revenues or investment was used as the basis for fees in those service categories engaged in public correspondence, the same arrangement would need to be considered in the case of private usage of spectrum by corporations and individuals. But, how does one meaningfully measure the *revenue producing capability* of a private commercial license (e.g., mining or oil explorations undertaking) in relation to their use of the radio spectrum?

In summary, attempts to relate licence fees to the revenue producing capability of the licensee in a quantitative fashion are not recommended. The historical procedure of administrative judgement and discretion, in this instance, is superior to the *apparent* precision of any revenue-investment based licence fee.

Nevertheless, the implications of the Cabinet directive respecting radio station licence fees need underscoring. The current tariff and the cost-based approach discussed in the previous pages regard the annual fees as a *price for a licence* whereas any revenue-based approach suggests that such fees become *prices for spectrum use*. In other words, the Cabinet directive, intimates quite a different orientation in the tariff rationale from current practice although the particular implementation, as argued above, seems impractical. The next alternative fee scheme implies a similar fundamental break with the *price for a licence* stance embodied in the current tariff.

(3) Spectrum Usage as a Benchmark for Relative Fees

As argued earlier, the allocation process is a mix of administrative discretion and enforcement of stipulated rules. Licence fees do not have a significant role in the allocation decisions but this third proposal for a tariff revision carries with it the possibility that licence fees would supplement the current allocative machinery. Most prices in the market place bear some direct relationship to the quantity of the goods or service which are purchased or utilized. Similarly, it is possible to imagine spectrum licence fees being related to a chosen measure of spectrum utilization (e.g., this measure could be a function of physical parameters such as assigned bandwidth and transmitter power).

One observation is critical at this point. Defining a physical unit upon which to base future licence fees does *not* provide a criterion for deciding on the price or fee per unit. In other words, one might continue to use total cost recovery as the rationale for the absolute level of fees while adopting some physical measurement of spectrum utilization as the basis for the relative fee structure. As a result, the licence fees might remain quite nominal in terms of absolute dollars and continue to have a marginal effect on the allocation process.

Bandwidth information is available in the existing files and work has begun to identify amounts of assigned bandwidth by service category and by company code. One implication of this spectrum usage approach is that the existing classification of licensees in the tariff might be subject to change. As a result the simulated revisions of the tariff will be more difficult to generate than the cost-based tariffs presented in this study.

Initial investigations suggest the existing information in the licence files is adequate to develop instructive tariff simulations but if the general implications of this spectrum usage approach are not acceptable continuing to work in this may be quite vain.

6 CONCLUSIONS

At this juncture, several conclusions can be drawn:

1. Although the current radio station tariff embodies an implicit ability-to-pay rationale, this study was motivated by a Cabinet directive which expressed a preference for an explicit rationale for future tariff changes.

2. Three distinct approaches towards a more explicit and rigorous rationale are examined in this study. Two of the three approaches intimate that licence fees ought to function more as *prices for spectrum use* than *prices for a licence*. The other approach proposes to use certain administrative costs as the benchmark for the relative fee structure and this is consistent with the basic notion that a licence fee should be simply a price for a licence.

3. All of the proposed tariff revisions in this study focus on new rationale for the relative fee structure. But, recovery of total spectrum management costs remains as the operative criterion for total licence fee revenues. If it was decided that the radio station tariff should become a integral part of the spectrum allocation process, this latter assumption is open to serious question.

4. Therefore, it is advisable that the fundamental objectives of the licence fees be opened to debate before accepting any proposal for a new relative licence fee structure. Unless it is decided that the radio station tariff should be an integral rather than incidental element in the spectrum allocation process one can seriously question the worth of any revision in the relative fee structure alone. Such a revision might create an illusion of rationality in the tariff while its current broad objectives remained substantially unaltered.

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]Y A – [redacted] of the [redacted]tation [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

	1914	1922	1924	1932	1933	1937	1938	1939	1940	1942	1948	1950	1953	1955	1958		1962	1968	1975
Limited Coast Station	10.00	50.00													Limited Maritime Mobile Service – Coast	50.00		75.00	97.50
															Private Maritime Mobile Service – Coast	10.00		20.00	26.00
Public Commercial Station	50.00														Public Commercial Service – Land	100.00		150.00	195.00
															Public Commercial Service – Mobile	25.00		35.00	46.00
															Restricted Public Commercial Service – Land	50.00		100.00	130.00
Private Commercial Station	10.00														Private Commercial Service – Land	10.00		20.00	26.00
															Private Commercial Service – Mobile	2.00		7.50	10.00
Experimental Station	5.00														Experimental Service – Land	5.00		20.00	26.00
Technical or Training School Station	1.00	5.00													Experimental Service – Mobile	5.00		10.00	13.00
Amateur Experimental Station	1.00		2.50												Amateur Experimental Service – Land	2.50		10.00	13.00
Ship Station	1.00		10.00					Class "A" 10.00							Ship Station Class "A"	10.00		15.00	20.00
								Class "B" 2.00							Ship Station Class "B"	2.00		10.00	13.00
Private Commercial Commercial Station		50.00			25.00*	50.00		Fee Based on Power & Service Area Population			Fee Based on Annual Gross Revenue				Private Commercial Broadcasting Station	Fee Based on Annual Gross Revenue		To CRTC	To CRTC
Amateur Broadcasting Station		5.00	10.00		5.00*	Discontinued													
Private Receiving Station		1.00		2.00			2.50						Discontinued						
Aircraft Station						10.00									Aeronautical Mobile Service – Land	10.00		20.00	26.00
															Aeronautical Mobile Service – Mobile	10.00		15.00	20.00
															Aircraft Navigational – Mobile	2.00		10.00	13.00
Commercial Receiving Station						2.00									Public Commercial Receiving Service – Land	10.00		15.00	20.00
															Public Commercial Receiving Service – Mobile	10.00		15.00	20.00
															Private Commercial Receiving Service – Land	2.00		10.00	13.00
															Private Commercial Receiving Service – Mobile	2.00		10.00	13.00
Special Private Receiving Station							2.00						Discontinued						
Eleemosynary or Educational Receiving Station								No Fee					Discontinued						
Private Receiving Station Employing a Crystal Receiver								No Fee					Discontinued						
Special Commercial Receiving Station								No Fee					Discontinued						
Private Receiving Station for the Entertainment of Active Service Forces									o Fee				Discontinued						
Municipal Police Private Commercial Station										1.00		Municipal Services Station 1.00			Municipal Service – Land	1.00		10.00	13.00
															Municipal Service – Mobile	1.00		10.00	13.00
Diplomatic Private Receiving Station													Discontinued						
United States of America Military Station														No Fee	United States of America – Land	No Fee		No Fee	No Fee
															Military Service – Mobile	No Fee			
Commercial Broadcasting Receiving Station														25.00	Commercial Broadcasting Receiving Service – Land	25.00		To CRTC	To CRTC
															Provincial Government Service – Land	No Fee		No Fee	No Fee
															Provincial Government Service – Mobile	No Fee			
															Public Commercial Automatic Repeater Service – Land	25.00		75.00	98.00
															Private Commercial Automatic Repeater Service – Land	5.00		10.00	13.00
															Remote Control Service – Land	1.00		Discontinued	
															Remote Control Service – Mobile	1.00			
															General Radio Service		3.00**	10.00**	13.00**
															Licence Application Fee			6.00	8.00

* Valid for Six Months

** Licence expires on March 31st three years following April 1st of the fiscal year in which it is issued.

APPENDIX B

Breakdown of DOC Spectrum Management Costs

The total estimated cost of the DOC spectrum management activity in 1975-76 is $18,760,000. A functional breakdown of this total is set out below:

SPECTRUM MANAGEMENT COSTS 1975-76
($ 000)

Operations and Management - Headquarters		
D.G. Telecomm. Regulations	162	
Director, Broadcast Eng.	935	
Director, Operations	1,298	
Director, Engineering	1,797	
Director, Program and Evaluation	113	
SMS Project	362	
	4,667	4,667
Operations and Management - Regions		
Enforcement	3,672	
Authorization	3,796	
Monitoring	1,000	
Overhead	2,263	
	10,731	10,731
Capital Expenditures* - Headquarters and Regions	3,362	3,362
Total	18,760	18,760

* Includes other expenses of $344,000

APPENDIX C

SERVICE CATEGORY DEFINITIONS

PUBLIC COMMERCIAL SERVICE - LAND AND MOBILE - being a service provided by land or mobile stations, including stations operated by provincial government agencies, and open for public correspondence with certain other land or mobile stations.

RESTRICTED PUBLIC COMMERCIAL SERVICE - LAND being a service provided by land stations, including stations operated by provincial government agencies, and open for restricted public correspondence with certain mobile stations.

PUBLIC COMMERCIAL AUTOMATIC REPEATER SERVICE - LAND being a service for the handling of public correspondence, provided by land stations operated for the automatic reception and transmission of radio within a communications system and that does not accept traffic from or deliver traffic to external points by means other than radio.

PUBLIC COMMERCIAL RECEIVING SERVICE - LAND AND MOBILE being a service for the handling of public correspondence, provided by land or mobile stations equipped for receptions only.

PRIVATE COMMERCIAL SERVICE - LAND AND MOBILE being a service provided by land or mobile stations or a system of such stations for:

(a) the handling of private communications of the licensee

(b) the control of mechanical objects or devices for industrial purposes, or

(c) the operation of a radio-navigation service

PRIVATE COMMERCIAL AUTOMATIC REPEATER SERVICE - LAND being a service for the handling of the private correspondence of the licensee, provided by land stations operated for the automatic reception and retransmission of radio within a communications system, that does not accept traffic from or deliver traffic to external points by means other than radio.

PRIVATE COMMERCIAL RECEIVING SERVICE - LAND AND MOBILE being a service provided by land or mobile stations equipped for reception only, for the purpose of receiving the private correspondence of the licensee, or signals from such stations as may be authorized.

AERONAUTICAL MOBILE SERVICE - LAND MOBILE being a service provided by mobile stations installed in aircraft or land stations for communication with stations of the International Aeronautical Mobile Service or other authorized stations relative to the safety, navigation or guidance of aircraft.

AIRCRAFT NAVIGATIONAL SERVICE - COAST being a service of limited radiocommunication provided by coast stations for the handling of public correspondence with certain ships or classes of ships in the International Maritime Mobile Service.

AIRCRAFT NAVIGATIONAL SERVICE - MOBILE being a service provided by rural or instrument display actuated by radio apparatus installed in aircraft solely for safety or navigational purposes, and includes portable radio apparatus carried in aircraft solely for safety or survival purposes and not intended for operation during flight.

PRIVATE MARITIME MOBILE SERVICE - COAST being a service provided by coast stations and limited to the handling of private correspondence relating to the business of the licensee with ships owned or so operated by or under charter to the licensee or with such other ship stations as the Minister may permit or require.

SHIP STATION LICENSES (A) & (B) - (A) being a licence for a ship station that is fitted with transmitting and receiving apparatus used for the purpose of carrying on two-way communication with other stations in the Maritime Mobile Service or for radio navigation; and

(B) being a licence for a ship station that is fitted only with receiving apparatus for navigation purposes used for taking bearings, fixing a position and the reception of weather reports and other aids to navigation reports.

SATELLITE RELATED "SPACE SERVICE" means a radio communications service provided by earth stations or space stations for communication

(i) between earth stations and space stations,

(ii) between space stations, or

(iii) between earth stations when the signals are retransmitted by space stations or are transmitted by relfection from objects in space excluding reflection or scattering by the ionosphere or within the earth's atmosphere

PROVINCIAL GOVERNMENT SERVICE - LAND AND MOBILE being a service provided by land or mobile stations for two-way radio communication systems and limited to communications relating to provincial government services including the enforcement of federal and provincial laws and municipal by-laws.

MUNICIPAL SERVICE - LAND AND MOBILE being a service provided by land or mobile stations operated for experimental, demonstration or educational purposes, with a view to the development of science or technique, or in connection with the test or development of communication equipment of radio-communication circuits.

AMATEUR EXPERIMENTAL SERVICE - LAND being a service in which land or mobile stations are operated for self training, intercommunication and technical investigations carried on by amateurs who are duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.

GENERAL RADIO SERVICE - LAND being a service provided by land or mobile stations for personal or private business radiotelephone communications and the radio control of models, (SOR/70-115).