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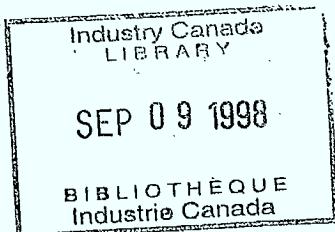
RATE OF CHANNEL CONSUMPTION FOR LAND MOBILE
RADIO
REPORT BY DTS-S
MAY 20, 1976

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J. GILBERT
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Distribution

FROM
OF

DTS-S

SUBJECT
OBJET Rate of Channel "consumption"

SECURITY-CLASSIFICATION - DE SÉCURITÉ

OUR FILE-N/RÉFÉRENCE

6110-24-1 (DTS-S)

YOUR FILE-V/RÉFÉRENCE

DATE
May 20, 1976

One criteria for the state of congestion in a band is the rate at which channels are "consumed". In this context, the word "consumed" is used to imply that in a given area the consumed channel is no longer vacant. If, in a given city, there are N channels available for land mobile usage in a given band, then that band is said to be in a state of "congestion" when all N channels are consumed. Congestion, however, does not imply that further assignments cannot be made in the band, because channel sharing does permit further loading of these channels. When further loading is impossible without severely degrading the quality of the service, the band is said to be in a state of saturation.

The attached computer printout represents the state of congestion of each VHF/UHF land mobile band within a radius of 70 miles from the centre of each of the major Canadian cities. The data is extracted from the FCC, IRAC and the DOC frequency list data tapes. There are two tables and a graph per page. The figures in the tables represent the total number of channels consumed during or prior to the year indicated. Thus, in Montreal, by 1972, there were 146 channels consumed in the 450-470 MHz band out of a total of N=800. The asterisk graphs are pictorial representations of the number of channels consumed in the band immediately to the left of the graph, and can be used for visual extrapolation. The scale is 1 asterisk per 20 channels for all tables except for the "all bands" table where it is 1 per 35 channels.

A table is also attached indicating the number of channels available to the land mobile service in the various bands in various cities. Note that in certain cities certain channels are not available due to prior allotments as is the case for maritime mobile service in cities within 100 miles from the water bodies. Using this table along with projections in the relevant table the expected date of congestion can be estimated. This congestion date is also shown on the graphs.

Page 2.

The congestion dates as derived from this extrapolation are not to be interpreted as the dates of saturation. The latter is difficult if not impossible to determine with the present state of knowledge because more and more systems can be shoe-horned into a band by sharing, off-set assigning, power limiting and system tailoring using directional antennas. The final state of saturation can only be reached when a specified percentage of users has to wait more than a specified length of time to get on the air, for a specified portion of the day. In fact the only reliable means of predicting saturation is by experience when assignments commence being difficult to make. The congestion date concept, however, is still useful for policy and strategic planning purposes wherein potential problems can be avoided by timely action. It provides a framework within which national solutions (such as spectrum re-allocation) can be imposed given that a problem is only localized in a few key areas. It provides the measure of the urgency for solutions.

Note that in certain areas the number of channels consumed exceeds the number of channels in the bands. This is due to the use of off-set channels which is becoming a widespread practice in Canada and the U.S.

For further discussion, please contact V. Sahay of DTS-S at 6-4749.

Distribution: DTS RDA
 DOS RDC
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Heaton
(for M.J. Hunt)

Att.

Rate of Channel Consumption

This report describes the concept of channel consumption rate and how it can be used to obtain approximate dates of saturation of the LM bands.

1. Predicting Land Mobile Saturation

The term "saturation" is extremely nebulous and hence hard to define. If it is used in the absolute sense, then saturation is reached when no further assignments can be made in a given LM band without seriously degrading the quality of the land mobile service. However, to determine when this state is reached, a figure of merit must be adopted implying the manner in which the land mobile service is seriously degraded. Also, there are so many ways in which a new assignment can be shoe-horned into a band that one can hardly say today that the band will be saturated tomorrow.

Nevertheless, some means has to be devised to determine a critical date before which new spectrum usage policies must be implemented so as to maintain the land mobile service. Three approaches are possible, two of which have been tried in the past and third will be tried soon in DTS-S.

The first and most obvious method is to determine the rate of growth of numbers of land mobiles in a given area, determine a "maximum number of mobiles tolerable" in a given channel, and correlate these to obtain a date of saturation. There are several problems with this approach. The DOC data bases are not set-up to deal with this. The Domestic Frequency List does not provide a sufficiently accurate count of the numbers of mobiles. The Licensing List is more accurate, but the absence of location data does not permit association with particular cities. Finally because in the past cancelled licenses were dropped from the data bases, use of either data base will indicate growth more rapid than actually took place. Another problem is the establishment of "maximum number of mobiles per channel".

The second method simply uses the rate at which unused channels are "consumed" and relates this to the maximum number of channels available in each band. For the purpose of discussion, a channel is said to be consumed when it is first assigned to a user. The approach suffers from the same problems with the data bases as the first one, but to a lesser extent. It uses base station information rather than mobile which gives the advantages that locations are known and, because base stations are dismantled less frequently, individual mobiles, past consumption rates can be expected to be relatively close to the actual. However, the end product by no means indicates saturation. The question is how close to saturation is a given band when projections of the rate of consumption curves indicate that all channels are consumed? This is discussed in the following section.

The third method, which will be undertaken shortly, is to make random duly engineered assignments in SW Ontario until a succession of assignments cannot be made due to electromagnetic incompatibility. The randomness of the assignments will be weighted by past assignment rates which are determined from the data bases. Thus this approach also suffers from data base problems, but in the final analysis is probably the most accurate of the three. It is complex and will not be discussed further here.

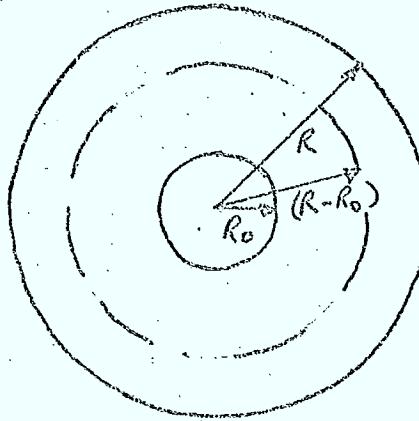
As stated earlier, the only object of this paper is to present the mechanics and rationale of the second method above and this is given in the following section. The relative merits of the outputs of the three methods is important to determine, but this report only discusses the relationship between the output of the rate of consumption method and actual saturation.

2. Theory of forecasting using rate of channel Consumption

2.1 A single city

1. Assume a circular city of radius R_0 in which channel assignments are to be made. Further, assume that assignments can be made in all directions around a city.

2. Assume that two assignments cannot be made within a distance R (to be relaxed later).



Any channels consumed in the region $R_0 < r < (R-R_0)$ are not available within $r < R_0$

Channels consumed in $R-R_0 < r < R$ only available in part of $r < R_0$.
For $R_0 \ll R$, this part would be $\sim 1/2$ of the area $r < R_0$

Arbitrarily, considering above and as a good approximation, let us say that assignments made within $R_0 \leq r \leq (R-R_0)^{\frac{1}{2}}$ cannot be made within $r < R_0$.

Let us assume that the rate of channel consumption within $r < R_0$ is linear and equals a_c , and within $R_0 \leq r \leq (R-R_0)^{\frac{1}{2}}$ it is also linear and equals a_s .

Then, at any given time, t , the number of channels consumed in city,

$$n_c = a_c t,$$

and the number of channels consumed outside

$$n_s = a_s t$$

A state of congestion is reached at time t when

$n_c + n_s = N_0$, where N_0 is the total number of channels available in a band.

$$a_0 T_0 + b_0 T_0 = N_0$$

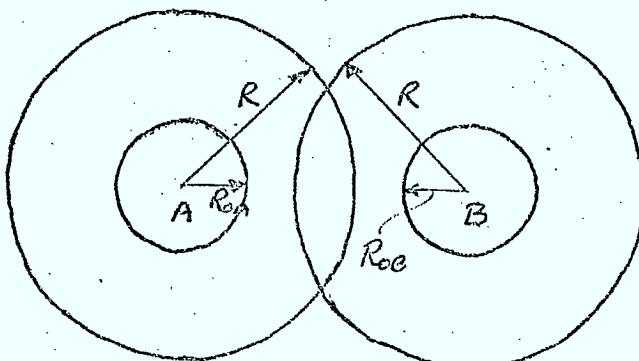
Then,

$$T_0 = \frac{N_0}{a_c + a_s} = \frac{N_0}{a_0}$$

The values $a_0 = a_c + a_s$ can, for small values of a_c and a_s (~ 0.2), be interpreted as the rate of channel consumption in the total area $r < R-R_0^{\frac{1}{2}}$.

Thus, to find T_0 for a given city, it suffices to determine the rate of channel consumption in a radius of $r = R-R_0^{\frac{1}{2}}$ and then to project to the point where all the channels in the given band are consumed.

2.2 Two Cities with overlapping areas



When two cities are less than $2R$ away from each other, the total number of channels available to each of the cities is reduced by the channels consumed in the other city. The analysis is similar to above.

Let a_0 be the rate of channel consumption within radius $R-R_{oa}$ of city A. Also, let a_{uo} be the rate in the unoverlapped area and a_{oo} be the rate in the overlapped area. Note that in the overlapped area are stations associated with both cities A and B.

The maximum number of channels available to the unoverlapped area at any given time is

$$N_0 = a_{uo} t$$

The date when congestion is reached insofar as city A is concerned is then given by:

$$a_{ua} T_0 = N_0 = a_{uo} T_0$$

or

$$T_0 = \frac{N_0}{a_{ua} + a_{uo}}$$

But $a_{ua} + a_{uo}$ is simply the rate of channel consumption within a radius of $R-R_{oa}$ of city A. Note that $a_{ua} + a_{uo} \neq 0$.

because of the presence of stations associated with city B in the overlapped area. Nevertheless, from the viewpoint of city A, the final date of congestion is derived by simply determining the rate of channel consumption within a radius of $R-R_{oa}$ of city A and extrapolating to N_0 . The presence

of city B does not disturb the conclusion reached for a single city standing alone..

2.3 Multiple over-lapping cities

By a similar analysis, it can be shown that the same conclusion can be reached when several cities overlap.

3. Effect of Sharing

The assumption that two assignments cannot be made within a distance R ignores sharing of channels. While channel sharing is not performed across the US/Canada border, it is generally adopted within each country.

The question that needs answering is whether the approach of seeking a congestion date by the simple method above gives a date which is so far in advance of the expected date of saturation as to be meaningless. The answer must be negative because a glance at the tables shows a steady increase in channel consumption instead of a rapid increase followed by a flat curve when no new channels are available. This implies that the frequency assigner has attempted to load already assigned channels before assigning new unused ones.

This answer is reasonable considering the likely behavior of the responsible frequency assigner. The frequency assigner has a tendency to informally categorize groups of users, has an intuitive desire to equalize loading of channels, has an abhorrence of assigning new channels which must be coordinated and hence delayed and wishes to avoid IM analysis where possible. It is reasonable to assume, therefore, that the rate of consumption of new channels reflects sharing atleast to the extent that loading without spectrum monitoring is feasible. Had this phenomenon not been in effect, the tables would have shown a rapid rise in the channels consumed due to a one-user-one-channel philosophy, followed by an absolute leveling off of the consumption due to the depletion of available channels. (Assignments will of course continue to be made as the under utilized channels are increasingly shared, but this will not be reflected in the rate of consumption curves). Since this characteristic is not observed, it is concluded that channel loading occurs before new channels are consumed and hence that the onset of congestion as predicted by the method above will not predate saturation beyond a reasonable amount of time.

4. Conclusion

In conclusion, the method, while it does not claim to predict the date of saturation, does provide reasonable target dates for policy and strategic planning.

V. Sahay
DTS-S2
July 22nd, 1976

TABLE 4xx

CHANNELS AVAILABLE IN MAJOR CITIES

	<u>30-50</u>	<u>138-144</u>	<u>148-150.8</u>	<u>150.8-174</u>	<u>410-420</u>	<u>450-470</u>	<u>Total</u>
Montreal	1000	200	88	691	400	800	3179
Toronto	1000	200	88	691	400	800	3179
Vancouver	1000	200	88	691	400	800	3179
Ottawa	1000	200	88	691	400	800	3179
Winnipeg	1000	200	88	691	400	800	3179
Hamilton	1000	200	88	691	400	800	3259
Edmonton	1000	200	88	771	400	800	3179
Quebec	1000	200	88	771	400	800	3259
Calgary	1000	200	88	691	400	800	3179
London	1000	200	88	691	400	800	3179
Windsor	1000	200	88	691	400	800	3179
Halifax	1000	200	88	691	400	800	3179
Victoria	1000	200	88	691	400	800	3179
Kitchener	1000	200	88	771	400	800	3259
Regina	1000	200	88	771	400	800	3179

CITY MONTREAL

POPULATION = 2775000

GROWTH(1966-73) = 5%

YEAR	30-50 MHz				136-144 MHz			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	5	5	*	0	0	0
1957	0	0	0	5	*	0	0	0
1958	0	0	0	5	*	0	0	0
1959	0	0	0	5	*	0	0	0
1960	0	0	0	5	*	0	0	0
1961	0	0	0	5	*	0	0	0
1962	0	0	1	5	*	0	0	1
1963	0	0	2	5	*	0	0	1
1964	0	0	1	5	*	0	0	1
1965	0	0	4	13	*	0	0	1
1966	1	0	11	24	*	0	0	1
1967	0	0	12	36	*	0	0	1
1968	0	0	11	47	*	0	0	6
1969	0	0	14	61	*	0	0	8
1970	0	0	12	73	*	0	0	11
1971	0	0	12	85	*	0	0	32
1972	0	0	22	107	*	0	0	56
1973	0	1	13	121	*	0	0	71
1974	0	0	10	131	*	0	0	80
1975	0	0	12	143	*	0	0	90
	TOTAL		143		TOTAL		90	

Available 1000 200

CITY MONTREAL

POPULATION = 2775000

GROWTH (1966-73) = 8%

YEAR	148-150.9 MHz			150.5-174 MHz						
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL		
1956	0	0	0	0	*	0	2	67	69	*****
1957	0	0	0	0	*	0	0	8	77	*****
1958	0	0	0	0	*	0	2	6	85	*****
1959	0	0	0	0	*	0	0	17	102	*****
1960	0	0	0	0	*	0	0	13	115	*****
1961	0	0	0	0	*	0	0	22	137	*****
1962	0	0	5	6	*	0	0	25	162	*****
1963	0	0	3	9	*	0	0	43	205	*****
1964	0	0	1	16	*	0	2	49	256	*****
1965	0	1	7	13	*	0	0	25	281	*****
1966	0	0	1	19	*	0	3	27	311	*****
1967	0	0	3	22	*	0	0	36	349	*****
1968	0	0	13	35	*	0	0	25	377	*****
1969	0	0	6	41	*	0	3	29	409	*****
1970	0	0	3	44	*	0	1	25	435	*****
1971	0	0	9	53	*	0	1	16	454	*****
1972	0	0	7	60	*	0	1	26	481	*****
1973	0	0	8	66	*	0	4	22	507	*****
1974	0	1	6	75	*	0	3	32	542	*****
1975	0	0	2	71	*	0	0	40	582	*****
TOTAL			77			TOTAL		582		

88

691

CITY MONTREAL

POPULATION = 2775000

GROWTH (1966-73) = 8%

YEAR	410-420 MHZ				450-470 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1955	0	0	0	0	*	0	0	5
1957	0	0	0	0	*	0	0	2
1958	0	0	0	0	*	0	0	2
1959	0	0	0	0	*	0	0	3
1960	0	0	0	0	*	0	0	12
1961	0	0	0	0	*	0	0	12
1962	0	0	0	0	*	0	0	3
1963	0	0	0	0	*	0	0	1
1964	0	0	0	0	*	0	0	3
1965	0	0	0	0	*	0	0	21
1966	0	0	14	14	*	0	0	2
1967	0	0	0	14	*	0	0	5
1968	0	0	0	14	*	0	0	35
1969	0	0	0	14	*	0	0	18
1970	0	0	0	14	*	0	0	91
1971	0	0	0	14	*	0	0	22
1972	0	0	4	10	*	0	0	33
1973	0	0	2	20	*	0	0	42
1974	0	0	17	31	*	0	0	85
1975	0	0	17	54	*	0	0	55
	TOTAL		54		TOTAL		328	

400

800

CITY MONTREAL

POPULATION 5775000.

የፍዴራል (1966-5) = 85:

YEAR	BANDS 2 TO 5					ALL BANDS				
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL		
1956	0	2	72	74	*	0	2	77	79	***
1957	0	0	10	84	*	0	0	10	89	***
1958	0	2	6	94	*	0	2	8	99	***
1959	0	0	20	114	*	0	0	20	119	****
1960	0	0	13	127	*	0	0	13	132	****
1961	0	0	22	149	*	0	0	22	154	*****
1962	0	0	35	184	*	0	0	36	190	*****
1963	0	0	47	231	*	0	0	49	239	*****
1964	0	2	53	200	*	0	2	54	205	*****
1965	0	1	34	321	*	0	1	38	334	*****
1966	0	3	44	355	*	0	3	55	392	*****
1967	0	0	46	414	*	0	0	58	450	*****
1968	0	0	53	407	*	0	0	64	514	*****
1969	0	3	55	525	*	0	3	69	586	*****
1970	0	1	69	595	*	0	1	81	666	*****
1971	0	1	61	677	*	0	1	93	762	*****
1972	0	1	63	761	*	0	1	105	868	*****
1973	0	4	59	854	*	0	5	102	975	*****
1974	0	4	155	1013	*	0	4	165	1144	*****
1975	0	0	118	1131	*	0	0	130	1274	*****
	TOTAL		1131			TOTAL		1274		

CITY TORONTO

POPULATION = 2692000

GROWTH (1966-73) = 17%

YEAR	30-50 MHZ					138-144 MHZ				
	FCC	IRAC	DUC	TOTAL		FCC	IRAC	DUC	TOTAL	
1956	0	0	13	13	*	0	0	0	0	*
1957	0	0	1	14	*	0	0	0	0	*
1958	0	0	0	14	*	0	0	0	0	*
1959	0	0	5	19	*	0	0	0	0	*
1960	0	0	1	20	*	0	0	0	0	*
1961	0	0	0	20	*	0	0	0	0	*
1962	0	0	0	20	*	0	0	0	0	*
1963	0	0	0	20	*	0	0	0	0	*
1964	0	0	9	29	*	0	0	0	0	*
1965	0	0	4	33	*	0	0	0	0	*
1966	0	2	6	41	*	0	0	0	0	*
1967	15	0	9	65	*	0	0	0	0	*
1968	27	1	16	110	*	0	0	2	2	*
1969	21	0	15	145	*	0	0	1	3	*
1970	20	1	20	187	*	0	0	32	35	**
1971	47	0	31	265	*	0	0	11	46	***
1972	13	0	30	305	*	0	0	4	50	***
1973	0	0	20	328	*	0	0	21	71	****
1974	0	0	16	346	*	0	0	14	85	*****
1975	0	0	27	373	*	0	0	11	96	*****
	TOTAL		373			TOTAL		96		

CITY TORONTO

19772

POPULATION = 2692000

GROWTH (1966-73) = 17%

YEAR	148-150.8 MHz				150.8-174 MHz			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	1	71
1957	0	0	1	1	*	0	0	10
1958	0	0	0	1	*	0	1	15
1959	0	0	0	1	*	0	0	22
1960	0	0	0	1	*	0	0	21
1961	0	0	4	5	*	0	1	31
1962	0	0	1	5	*	0	2	28
1963	0	0	3	9	*	0	0	54
1964	0	0	0	9	*	0	6	55
1965	0	0	1	10	*	0	0	60
1966	0	1	5	16	*	1	1	34
1967	0	0	7	23	*	20	1	37
1968	0	0	12	35	*	23	6	40
1969	0	0	7	42	*	40	0	32
1970	0	0	9	51	*	29	2	21
1971	0	0	8	59	*	58	4	26
1972	0	0	7	65	*	20	7	55
1973	0	0	8	74	*	0	3	40
1974	0	2	3	79	*	0	2	54
1975	0	0	4	83	*	0	1	30
TOTAL			53			TOTAL		965

CITY TORONTO

POPULATION = 2692600

GROWTH (1966-73) = 17%

YEAR	410-420 MHz			450-470 MHz			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC

1956	0	0	0	0	*	0	0	0	0	*
1957	0	0	0	0	*	0	0	0	0	*
1958	0	0	0	0	*	0	0	2	10	*
1959	0	0	0	0	*	0	0	2	12	*
1960	0	0	0	0	*	0	0	3	15	*
1961	0	0	0	0	*	0	0	3	18	*
1962	0	0	0	0	*	0	0	1	19	*
1963	0	0	0	0	*	0	0	1	20	**
1964	0	0	0	0	*	0	0	2	22	**
1965	0	0	0	0	*	0	0	4	26	**
1966	0	0	0	0	*	0	0	10	36	**
1967	0	0	0	0	*	5	0	5	46	***
1968	0	0	0	0	*	11	0	11	60	****
1969	0	0	0	0	*	35	0	30	133	*****
1970	0	0	0	0	*	29	0	50	212	*****
1971	0	0	1	1	*	72	0	46	330	*****
1972	0	0	0	1	*	25	0	51	406	*****
1973	0	0	0	1	*	0	0	81	487	*****
1974	0	0	14	15	*	0	0	100	595	*****
1975	0	0	19	34	*	0	0	35	630	*****
TOTAL			54			TOTAL			630	

CITY TORONTO

POPULATION = 26929000

GROWTH (1956-73) = 17%

BANDS 2 TO 6

ALL BANDS

YEAR	FCC IRAC DDC TOTAL					FCC IRAC DDC TOTAL				
	0	1	79	80	*	0	1	92	93	***
1956	0	1	79	80	*	0	1	92	93	***
1957	0	0	11	91	*	0	0	12	105	****
1958	0	1	17	109	*	0	1	17	123	****
1959	0	0	24	133	*	0	0	29	152	*****
1960	0	0	24	157	*	0	0	25	177	*****
1961	0	1	38	195	*	0	1	38	216	*****
1962	0	2	30	226	*	0	2	30	246	*****
1963	0	0	58	265	*	0	0	58	306	*****
1964	0	0	57	349	*	0	0	66	378	*****
1965	0	0	65	414	*	0	0	69	447	*****
1966	1	2	49	465	*	1	4	55	507	*****
1967	25	1	49	541	*	40	1	55	606	*****
1968	34	6	65	646	*	62	7	81	756	*****
1969	75	0	70	791	*	96	0	85	937	*****
1970	55	2	112	953	*	76	3	132	1150	*****
1971	130	4	92	1189	*	177	4	123	1454	*****
1972	45	7	117	1358	*	58	7	147	1666	*****
1973	0	3	150	1511	*	0	3	170	1839	*****
1974	0	4	193	1705	*	0	4	211	2054	*****
1975	0	1	99	1808	*	0	1	126	2181	*****
	TOTAL		1608			TOTAL		2181		

CITY VANCOUVR

POPULATION = 1116000

GROWTH (1965-73) = 15%

YEAR	30-50 MHZ			13c-144 MHZ				
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	2	2	*	0	0	0
1957	0	0	0	2	*	0	0	0
1958	0	0	0	2	*	0	0	0
1959	0	0	0	2	*	0	0	0
1960	0	0	0	2	*	0	0	0
1961	0	0	0	2	*	0	0	0
1962	0	0	0	2	*	0	0	0
1963	0	0	0	2	*	0	0	0
1964	0	0	0	2	*	0	0	0
1965	0	0	1	3	*	0	0	0
1966	0	0	5	8	*	0	0	1
1967	2	0	4	14	*	0	0	1
1968	12	1	6	33	*	0	0	3
1969	11	0	4	48	*	0	0	2
1970	10	0	3	61	*	0	0	1
1971	8	0	6	75	*	0	0	7
1972	6	0	8	89	*	0	0	11
1973	0	0	1	90	*	0	0	10
1974	0	1	7	95	*	0	0	49
1975	0	0	3	101	*	0	0	78
	TOTAL		101		TOTAL		78	

CITY VANCOUVR

POPULATION= 1116000

GROWTH(1966-73)= 19%

YEAR	148-150.8 MHZ			150.8-174 MHZ						
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL		
1956	0	0	0	0	*	0	4	59	63	*****
1957	0	0	0	0	*	0	0	8	71	*****
1958	0	0	0	0	*	0	0	14	85	*****
1959	0	0	0	0	*	0	0	11	96	*****
1960	0	0	0	0	*	0	0	12	106	*****
1961	6	0	2	2	*	0	1	25	134	*****
1962	0	0	2	4	*	0	0	36	170	*****
1963	0	0	0	4	*	0	0	29	199	*****
1964	0	0	0	4	*	0	1	36	236	*****
1965	0	0	0	4	*	0	0	29	265	*****
1966	0	0	0	4	*	0	4	30	299	*****
1967	0	0	1	5	*	8	0	48	355	*****
1968	0	0	3	3	*	24	0	48	427	*****
1969	0	0	0	5	*	26	2	25	480	*****
1970	0	0	0	8	*	14	0	29	523	*****
1971	0	0	0	8	*	9	5	26	553	*****
1972	0	0	4	12	*	0	0	46	611	*****
1973	0	0	14	26	*	0	7	30	654	*****
1974	0	0	10	36	*	0	0	37	691	*****
1975	0	0	12	45	*	0	0	21	712	*****
	TOTAL		45		TOTAL			712		

CITY VANCOUVR

POPULATION = 1116000

GROWTH (1966-73) = 19%

YEAR	410-420 MHZ			450-470 MHZ				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	0	0	*	0	0	3
1957	0	0	0	0	*	0	0	1
1958	0	0	0	0	*	0	0	4
1959	0	0	0	0	*	0	0	4
1960	0	0	0	0	*	0	0	2
1961	0	0	0	0	*	0	0	2
1962	0	0	0	0	*	0	0	0
1963	0	0	0	0	*	0	0	5
1964	0	0	0	0	*	0	0	4
1965	0	0	0	0	*	0	0	19
1966	0	0	0	0	*	0	0	21
1967	0	0	0	0	*	2	0	3
1968	0	0	0	0	*	2	0	9
1969	0	0	0	0	*	5	0	4
1970	0	0	0	0	*	5	0	20
1971	0	0	0	0	*	11	0	23
1972	0	0	0	0	*	11	0	28
1973	0	2	4	0	*	0	0	32
1974	0	0	13	14	*	0	0	224
1975	0	0	8	27	*	0	0	34
	TOTAL		27		TOTAL		255	

CITY VANCOUVER

Congestion > 1985

POPULATION = 1116000

GROWTH (1966-73) = 19%

YEAR	BANDS 2 TO 6					ALL BANDS				
	FCC	IRAC	DUC	TOTAL	*	FCC	IRAC	DUC	TOTAL	*

1956	0	4	62	66	*	0	4	64	58	**
------	---	---	----	----	---	---	---	----	----	----

1957	0	0	9	75	*	0	0	9	77	***
------	---	---	---	----	---	---	---	---	----	-----

1958	0	0	14	89	*	0	0	14	91	***
------	---	---	----	----	---	---	---	----	----	-----

1959	0	0	11	100	*	0	0	11	102	***
------	---	---	----	-----	---	---	---	----	-----	-----

1960	0	0	14	114	*	0	0	14	116	****
------	---	---	----	-----	---	---	---	----	-----	------

1961	0	1	29	144	*	0	1	29	146	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1962	0	0	32	182	*	0	0	38	184	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1963	0	0	34	216	*	0	0	34	218	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1964	0	1	40	257	*	0	1	40	259	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1965	0	0	31	288	*	0	0	32	291	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1966	0	4	33	325	*	0	4	38	333	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1967	10	0	52	387	*	12	0	56	401	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1968	25	0	63	476	*	38	1	69	509	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1969	31	2	31	540	*	42	2	35	548	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1970	19	0	50	609	*	29	0	53	670	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1971	20	5	49	683	*	28	5	55	758	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1972	19	6	76	776	*	25	0	64	867	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1973	0	5	96	853	*	0	9	97	973	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1974	0	6	157	1040	*	0	1	164	1138	*****
------	---	---	-----	------	---	---	---	-----	------	-------

1975	0	6	83	1123	*	0	0	85	1224	*****
------	---	---	----	------	---	---	---	----	------	-------

TOTAL 1123

TOTAL 1224

CITY HAMILTON

POPULATION = 513000

GROWTH (1966-73) = 13%

YEAR	30-50 MHZ				135-144 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	13	13	*	0	0	0
1957	0	0	1	14	*	0	0	0
1958	0	0	0	14	*	0	0	0
1959	0	0	4	15	*	0	0	0
1960	0	0	0	15	*	0	0	0
1961	0	0	0	15	*	0	0	0
1962	0	0	0	15	*	0	0	0
1963	0	0	0	15	*	0	0	0
1964	0	0	3	21	*	0	0	0
1965	0	0	5	26	*	0	0	0
1966	0	1	13	40	*	0	0	0
1967	15	0	13	68	*	0	0	0
1968	31	1	15	115	*	0	0	2
1969	20	0	16	151	*	0	0	1
1970	18	1	15	185	*	0	0	25
1971	48	0	32	265	*	0	0	36
1972	14	0	31	310	*	0	0	45
1973	0	0	21	331	*	0	0	18
1974	0	0	19	350	*	0	0	77
1975	0	0	25	375	*	0	0	86
	TOTAL		375		TOTAL		86	

CITY HAMILTON

POPULATION = 513000

GROWTH (1966-73) = 13%

YEAR	146-150.8 MHz				150.8-174 MHz			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	0	0	*	0	1	68
1957	0	0	1	1	*	0	0	10
1958	0	0	0	1	*	0	1	14
1959	0	0	0	1	*	0	0	22
1960	0	0	0	1	*	0	0	22
1961	0	0	4	5	*	0	1	35
1962	0	0	1	6	*	0	2	26
1963	0	0	3	9	*	0	0	49
1964	0	0	0	9	*	0	6	52
1965	0	0	1	10	*	0	0	51
1966	0	1	5	15	*	1	1	31
1967	0	0	7	23	*	16	1	36
1968	0	0	11	34	*	29	6	42
1969	0	0	8	42	*	35	0	29
1970	0	0	8	50	*	29	2	20
1971	0	0	9	54	*	56	4	32
1972	0	0	6	65	*	26	7	62
1973	0	0	9	74	*	0	3	53
1974	0	2	3	74	*	0	2	51
1975	0	0	3	62	*	0	1	27
TOTAL			62		TOTAL			962

CITY HAMILTON

POPULATION = 513000

GROWTH (1965-73) = 13%

YEAR	410-420 MHz			450-470 MHz			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC

1956	0	0	0	0	*	0	0	0	0	*
1957	0	0	0	0	*	0	0	0	0	*
1958	0	0	0	0	*	0	0	2	5	*
1959	0	0	0	0	*	0	0	1	4	*
1960	0	0	0	0	*	0	0	3	12	*
1961	0	0	0	0	*	0	0	3	15	*
1962	0	0	0	0	*	0	0	1	16	*
1963	0	0	0	0	*	0	0	1	17	*
1964	0	0	0	0	*	0	0	2	19	*
1965	0	0	0	0	*	0	0	4	23	**
1966	0	0	0	0	*	0	0	9	32	**
1967	0	0	0	0	*	5	0	5	42	***
1968	0	0	0	0	*	10	0	10	62	****
1969	0	0	0	0	*	34	0	29	125	*****
1970	0	0	2	2	*	29	0	47	201	*****
1971	0	0	1	3	*	13	0	46	320	*****
1972	0	0	5	8	*	25	0	40	391	*****
1973	0	0	0	5	*	0	0	79	470	*****
1974	0	0	11	15	*	0	0	100	576	*****
1975	0	0	21	40	*	0	0	39	615	*****
	TOTAL	40			TOTAL	615				

CITY HAMILTON

POPULATION = 513000

GROWTH (1966-73) = 13%

BANDS 2 TO 6

ALL CANUS

YEAR FCC IRAC DGC TOTAL

FCC IRAC DGC TOTAL

1956	0	1	74	75	*	0	1	87	88	***
1957	0	0	11	85	*	0	0	12	100	***
1958	0	1	15	103	*	0	1	16	117	****
1959	0	0	23	126	*	0	0	27	144	*****
1960	0	0	25	151	*	0	0	25	169	*****
1961	0	1	42	194	*	0	1	42	212	*****
1962	0	2	26	224	*	0	2	28	242	*****
1963	0	0	53	277	*	0	0	53	295	*****
1964	0	6	54	337	*	0	6	57	358	*****
1965	0	0	56	393	*	0	0	61	414	*****
1966	1	2	45	441	*	1	3	58	481	*****
1967	21	1	48	511	*	36	1	61	579	*****
1968	39	6	65	521	*	70	7	80	736	*****
1969	69	0	67	757	*	89	0	83	908	*****
1970	58	2	95	916	*	76	3	114	1101	*****
1971	129	4	101	1150	*	177	4	133	1415	*****
1972	51	7	126	1334	*	65	7	157	1644	*****
1973	0	3	159	1496	*	0	3	180	1827	*****
1974	0	4	185	1665	*	0	4	204	2035	*****
1975	0	1	101	1787	*	0	1	126	2162	*****
TOTAL			1767			TOTAL			2162	

CITY WINSTON

POPULATION = 264000

GROWTH (1966-73) = 11%

YEAR	30-50 MHZ				136-144 MHZ				
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL	
1956	0	0	4	4	*	0	0	0	
1957	0	0	0	4	*	0	0	0	
1958	0	0	0	4	*	0	0	0	
1959	0	0	0	4	*	0	0	0	
1960	0	0	0	4	*	0	0	0	
1961	0	0	1	5	*	0	0	0	
1962	0	0	0	5	*	0	0	0	
1963	0	0	5	10	*	0	0	0	
1964	0	0	2	12	*	0	0	0	
1965	0	0	1	13	*	0	0	0	
1966	1	0	2	16	*	0	0	0	
1967	31	0	4	51	*	0	0	0	
1968	55	0	1	107	*	0	0	0	
1969	52	0	3	162	*	0	0	0	
1970	54	1	6	223	*	0	0	0	
1971	45	0	4	272	*	0	0	0	
1972	35	0	23	331	*	0	0	10	
1973	0	0	2	333	*	0	0	14	
1974	0	0	5	338	*	0	0	34	
1975	0	1	6	345	*	0	0	35	
TOTAL	345				TOTAL	35			

CITY WINDSOR

POPULATION = 264000

GROWTH (1956-73) = 11%

YEAR	148-150.8 MHz				150.8-174 MHz				TOTAL	
	FCC	IRAC	DUC	TOTAL	FCC	IPAC	DUC	TOTAL		
1956	0	0	0	0	*	0	2	27	29	**
1957	0	0	0	0	*	0	1	2	32	**
1958	0	0	0	0	*	0	0	3	35	**
1959	0	0	0	0	*	0	0	3	38	**
1960	0	0	0	0	*	0	0	7	45	***
1961	0	0	1	1	*	0	1	4	50	***
1962	0	0	0	1	*	0	3	9	62	****
1963	0	0	1	2	*	3	2	10	77	****
1964	0	0	0	2	*	3	6	15	101	*****
1965	0	0	0	2	*	4	1	10	116	*****
1966	0	1	1	4	*	4	4	17	141	*****
1967	0	0	2	5	*	62	4	18	225	*****
1968	0	1	3	10	*	88	8	10	331	*****
1969	0	0	0	10	*	66	6	8	411	*****
1970	0	0	2	12	*	137	1	9	558	*****
1971	0	0	2	14	*	73	6	11	648	*****
1972	0	1	0	15	*	52	14	19	733	*****
1973	0	0	5	20	*	0	3	16	754	*****
1974	0	2	1	23	*	0	4	12	770	*****
1975	0	0	2	25	*	0	9	17	796	*****
TOTAL		65			TOTAL				796	

CITY WINDSOR

POPULATION = 254000

GROWTH(1966-73) = 11%

YEAR	410-420 MHZ				450-470 MHZ			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	0	0	*	0	0	1
1957	0	0	0	0	*	0	0	1
1958	0	0	0	0	*	0	0	1
1959	0	0	0	0	*	0	0	1
1960	0	0	0	0	*	0	0	1
1961	0	0	0	0	*	0	0	1
1962	0	0	0	0	*	0	0	3
1963	0	0	0	0	*	0	0	4
1964	0	0	0	0	*	0	0	3
1965	0	0	0	0	*	0	0	7
1966	0	0	0	0	*	0	0	8
1967	0	0	0	0	*	13	0	22
1968	0	0	0	0	*	56	0	80
1969	0	0	0	0	*	91	0	175
1970	0	0	2	2	*	99	0	274
1971	0	0	0	2	*	118	0	398
1972	0	0	0	2	*	119	0	521
1973	0	0	2	4	*	4	0	10
1974	0	0	0	4	*	0	0	544
1975	0	0	5	9	*	0	0	546
TOTAL			9		TOTAL			546

CITY WINDSOR

POPULATION = 254000 GROWTH (1966-73) = 11%

YEAR	BANDS 2 TO 6					ALL BANDS				
	FCC	IRAC	DUC	TOTAL	*	FCC	IRAC	DUC	TOTAL	*
1956	0	2	28	30	*	0	2	32	34	*
1957	0	1	2	33	*	0	1	2	37	**
1958	0	0	3	35	*	0	0	3	40	**
1959	0	0	3	39	*	0	0	3	43	**
1960	0	0	7	46	*	0	0	7	50	**
1961	0	1	5	52	*	0	1	6	57	**
1962	0	3	12	67	*	0	3	12	72	***
1963	3	2	11	83	*	3	2	16	93	***
1964	3	0	18	110	*	3	6	20	122	****
1965	4	1	10	125	*	4	1	11	136	****
1966	4	5	19	153	*	5	5	21	169	*****
1967	75	4	21	253	*	106	4	25	304	*****
1968	144	7	15	421	*	199	9	16	526	*****
1969	157	6	12	595	*	209	6	15	758	*****
1970	236	1	13	845	*	290	2	19	1069	*****
1971	191	6	19	1052	*	236	6	23	1334	*****
1972	171	15	33	1281	*	207	15	56	1612	*****
1973	4	3	49	1337	*	4	3	51	1670	*****
1974	0	6	32	1375	*	0	6	37	1713	*****
1975	0	9	27	1411	*	0	10	33	1756	*****
	TOTAL			1411		TOTAL			1756	

CITY VICTORIA

POPULATION = 203000

GROWTH (1966-73) = 16%

YEAR	30-50 MHZ				136-144 MHZ			
	FCC	IPAC	DUC	TOTAL	FCC	IPAC	DUC	TOTAL
1956	0	0	2	2	*	0	0	0
1957	0	0	0	2	*	0	0	0
1958	0	0	0	2	*	0	0	0
1959	0	0	0	2	*	0	0	0
1960	0	0	0	2	*	0	0	0
1961	0	0	1	3	*	0	0	0
1962	0	0	0	3	*	0	0	0
1963	0	0	0	3	*	0	0	0
1964	0	0	0	3	*	0	0	0
1965	0	0	1	4	*	0	0	0
1966	0	0	4	8	*	0	0	0
1967	9	0	4	21	*	0	0	0
1968	27	1	6	35	*	0	0	3
1969	17	0	3	75	*	0	0	5
1970	23	0	4	162	*	0	0	6
1971	14	1	5	122	*	0	0	7
1972	13	0	6	141	*	0	0	9
1973	0	0	1	142	*	0	0	19
1974	0	1	7	150	*	0	0	52
1975	0	0	3	153	*	0	0	59
	TOTAL			153		TOTAL		59

CITY VICTORIA

POPULATION = 203000

GROWTH(1966-73) = 16%

148-150.5 MHZ

150.5-174 MHZ

FCC IRAC DUC TOTAL

YEAR	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL		
1956	0	0	0	0	*	0	5	55	60	*****
1957	0	0	0	0	*	0	0	7	67	*****
1958	0	0	0	0	*	0	0	13	80	*****
1959	0	0	0	0	*	0	0	9	89	*****
1960	0	0	0	0	*	0	0	10	99	*****
1961	0	0	3	3	*	0	1	23	123	*****
1962	0	0	1	4	*	0	0	34	157	*****
1963	0	0	0	4	*	0	3	25	185	*****
1964	0	0	1	5	*	0	6	34	225	*****
1965	0	0	0	5	*	0	0	28	253	*****
1966	0	0	0	5	*	0	4	26	283	*****
1967	0	0	1	6	*	14	0	45	342	*****
1968	0	0	3	9	*	44	2	45	433	*****
1969	0	0	0	9	*	61	4	24	522	*****
1970	0	0	0	9	*	26	2	34	584	*****
1971	0	0	2	11	*	25	7	20	636	*****
1972	0	0	2	15	*	17	7	35	695	*****
1973	0	0	13	20	*	0	7	34	736	*****
1974	0	0	10	35	*	0	3	36	775	*****
1975	0	1	12	49	*	0	2	26	803	*****
TOTAL			49		TOTAL			803		

CITY VICTORIA

POPULATION = 203000

GROWTH (1966-73) = 15%

YEAR	410-420 MHz				450-470 MHz			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL

1956	0	0	0	0	*	0	0	3	3	*
1957	0	0	0	0	*	0	0	1	4	*
1958	0	0	0	0	*	0	0	0	4	*
1959	0	0	0	0	*	0	0	0	4	*
1960	0	0	0	0	*	0	0	2	6	*
1961	0	0	0	0	*	0	0	2	8	*
1962	0	0	0	0	*	0	0	0	8	*
1963	0	0	0	0	*	0	0	5	13	*
1964	0	0	0	0	*	0	0	4	17	*
1965	0	0	0	0	*	0	0	2	19	*
1966	0	0	0	0	*	0	0	2	21	**
1967	0	0	0	0	*	10	0	3	34	**
1968	0	0	0	0	*	11	0	9	54	***
1969	0	0	0	0	*	26	0	4	84	****
1970	0	0	0	0	*	27	0	20	131	*****
1971	0	0	0	0	*	24	0	23	178	*****
1972	0	1	0	1	*	23	0	25	226	*****
1973	0	2	4	7	*	0	0	28	254	*****
1974	0	0	9	16	*	0	0	45	299	*****
1975	0	0	10	26	*	0	0	33	332	*****
TOTAL		46				TOTAL		332		

CITY VICTORIA

POPULATION = 203000

GROWTH(1966-73) = 16%

BANUS 2 TO 5

ALL BANUS

YEAR FCC IRAC DOC TOTAL

FCC IRAC DOC TOTAL

1956	0	5	58	63	*	0	5	60	65	**
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1957	0	0	6	71	*	0	0	6	73	***
------	---	---	---	----	---	---	---	---	----	-----

1958	0	0	13	84	*	0	0	13	86	***
------	---	---	----	----	---	---	---	----	----	-----

1959	0	0	9	93	*	0	0	9	95	***
------	---	---	---	----	---	---	---	---	----	-----

1960	0	0	12	105	*	0	0	12	107	****
------	---	---	----	-----	---	---	---	----	-----	------

1961	0	1	28	154	*	0	1	29	137	****
------	---	---	----	-----	---	---	---	----	-----	------

1962	0	0	35	169	*	0	0	35	172	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1963	0	3	30	202	*	0	3	30	205	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1964	0	0	37	247	*	0	6	39	250	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1965	0	0	36	277	*	0	0	31	261	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1966	0	4	28	309	*	0	4	32	317	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1967	24	6	49	382	*	33	0	53	403	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1968	55	2	60	499	*	52	3	66	554	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1969	67	4	30	620	*	104	4	33	695	*****
------	----	---	----	-----	---	-----	---	----	-----	-------

1970	53	2	55	730	*	76	2	59	832	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1971	44	7	48	832	*	63	8	51	954	*****
------	----	---	----	-----	---	----	---	----	-----	-------

1972	40	0	64	944	*	53	8	70	1065	*****
------	----	---	----	-----	---	----	---	----	------	-------

1973	3	9	89	1042	*	0	9	90	1184	*****
------	---	---	----	------	---	---	---	----	------	-------

1974	0	3	103	1178	*	0	4	140	1328	*****
------	---	---	-----	------	---	---	---	-----	------	-------

1975	0	3	66	1269	*	0	3	91	1422	*****
------	---	---	----	------	---	---	---	----	------	-------

TOTAL 1269

TOTAL 1422

CITY OTTAWA

POPULATION = 619000

GROWTH (1966-73) = 17%

YEAR	30-50 MHz					136-144 MHz				
	FCC	IRAC	DUC	TOTAL	*	FCC	IRAC	DUC	TOTAL	*
1956	0	0	9	9	*	0	0	0	0	*
1957	0	0	3	12	*	0	0	0	0	*
1958	0	0	0	12	*	0	0	0	0	*
1959	0	0	0	12	*	0	0	0	0	*
1960	0	0	1	13	*	0	0	0	0	*
1961	0	0	0	13	*	0	0	0	0	*
1962	0	0	1	14	*	0	0	0	0	*
1963	0	0	1	15	*	0	0	0	0	*
1964	0	0	8	23	*	0	0	0	0	*
1965	0	0	0	23	*	0	0	1	1	*
1966	0	0	5	25	*	0	0	0	1	*
1967	1	0	7	36	*	0	0	2	3	*
1968	5	0	5	40	*	0	0	0	3	*
1969	4	0	6	50	*	0	0	0	3	*
1970	3	0	5	64	*	0	0	1	4	*
1971	11	0	9	84	*	0	0	0	4	*
1972	5	0	17	105	*	0	0	7	11	*
1973	0	0	10	115	*	0	0	0	11	*
1974	0	0	8	124	*	0	0	16	29	**
1975	0	0	6	132	*	0	0	6	35	**
	TOTAL		132			TOTAL		35		

CITY OTTAWA

POPULATION = 619000 GROWTH(1966-73) = 17%

YEAR	146-150.8 MHZ				150.8-174 MHZ					
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL		
1956	0	0	0	0	*	0	1	26	29	**
1957	0	0	0	0	*	0	0	5	34	**
1958	0	0	0	0	*	0	0	4	38	**
1959	0	0	0	0	*	0	0	5	43	***
1960	0	0	0	0	*	0	0	7	50	***
1961	0	0	2	2	*	0	0	20	70	****
1962	0	0	0	2	*	0	0	8	78	****
1963	0	0	1	3	*	0	0	19	97	*****
1964	0	0	1	4	*	0	5	18	120	*****
1965	0	0	1	5	*	0	0	32	152	*****
1966	0	0	0	5	*	0	0	28	180	*****
1967	0	0	4	7	*	0	1	20	201	*****
1968	0	0	1	10	*	3	3	33	240	*****
1969	0	0	3	13	*	3	2	13	256	*****
1970	0	0	1	14	*	2	0	19	279	*****
1971	0	0	1	15	*	13	1	40	333	*****
1972	0	0	4	19	*	2	1	36	372	*****
1973	0	0	14	33	*	0	1	38	411	*****
1974	0	0	8	41	*	0	1	30	442	*****
1975	0	0	4	45	*	0	0	27	469	*****
	TOTAL		45		TOTAL		469			

CITY OTTAWA

POPULATION = 619000

GROWTH (1956-73) = 17%

YEAR	410-420 MHZ			450-470 MHZ				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	0	0	*	0	0	1
1957	0	0	0	0	*	0	0	0
1958	0	0	0	0	*	0	0	0
1959	0	0	0	0	*	0	0	1
1960	0	0	0	0	*	0	0	2
1961	0	0	0	0	*	0	0	2
1962	0	0	0	0	*	0	0	0
1963	0	0	0	0	*	0	0	1
1964	0	0	0	0	*	0	0	4
1965	0	0	0	0	*	0	0	7
1966	0	0	0	0	*	0	0	7
1967	0	0	0	0	*	0	0	7
1968	0	0	0	0	*	0	0	0
1969	0	0	0	0	*	0	0	1
1970	0	0	0	0	*	0	0	2
1971	0	0	0	0	*	0	0	9
1972	0	0	0	0	*	1	0	1
1973	0	0	0	0	*	0	0	23
1974	0	0	3	3	*	0	0	22
1975	0	0	20	23	*	0	0	9
	TOTAL		23		TOTAL		75	

CITY OTTAWA

POPULATION = 619000 GROWTH (1966-73) = 17%

BANDS 2 TO 6

ALL BANDS

YEAR	BANDS 2 TO 6					ALL BANDS				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL		
1956	0	1	29	30	*	0	1	38	39	**
1957	0	0	5	35	*	0	0	8	47	**
1958	0	0	4	39	*	0	0	4	51	**
1959	0	0	6	45	*	0	0	6	57	**
1960	0	0	7	52	*	0	0	8	65	**
1961	0	0	22	74	*	0	0	22	87	***
1962	0	0	8	82	*	0	0	9	96	***
1963	0	0	21	103	*	0	0	22	118	****
1964	0	5	23	131	*	0	5	31	154	*****
1965	0	0	34	165	*	0	0	34	188	*****
1966	0	0	28	193	*	0	0	33	221	*****
1967	3	1	25	220	*	1	1	33	256	*****
1968	3	3	34	260	*	8	3	39	306	*****
1969	3	2	17	282	*	7	2	23	338	*****
1970	2	0	23	307	*	5	0	28	371	*****
1971	13	1	50	371	*	24	1	59	455	*****
1972	3	1	43	423	*	8	1	65	529	*****
1973	0	1	75	499	*	0	1	85	615	*****
1974	0	1	81	581	*	0	1	89	705	*****
1975	0	0	66	647	*	0	0	74	779	*****
	TOTAL			647		TOTAL			779	

CITY WINNIPEG

POPULATION= 560000

GROWTH(1966-73)= 10%

YEAR	30-50 MHZ				138-144 MHZ			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL

1956	0	0	1	1	*	0	0	0
1957	0	0	0	1	*	0	0	0
1958	0	0	0	1	*	0	0	0
1959	0	0	0	1	*	0	0	0
1960	0	0	0	1	*	0	0	0
1961	0	0	0	1	*	0	0	0
1962	0	0	0	1	*	0	0	0
1963	0	0	0	1	*	0	0	0
1964	0	0	0	1	*	0	0	3
1965	0	0	0	1	*	0	0	3
1966	0	0	0	1	*	0	0	3
1967	0	0	2	3	*	0	0	3
1968	0	0	0	3	*	0	0	5
1969	1	0	2	6	*	0	0	8
1970	0	0	4	10	*	0	0	8
1971	0	0	1	11	*	0	0	10
1972	0	0	4	15	*	0	0	10
1973	0	0	4	19	*	0	0	11
1974	0	0	12	31	*	0	0	13
1975	0	0	5	36	*	0	0	16

TOTAL	36	TOTAL	16
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CITY WINNIPEG

POPULATION = 560000 GROWTH (1966-73) = 10%

148-150 MHZ

YEAR FCC IRAC DUC TOTAL

150.8-174 MHZ

FCC IRAC DUC TOTAL

1956	0	0	0	0	*	0	0	27	27	**
1957	0	0	0	0	*	0	0	4	31	**
1958	0	0	0	0	*	0	4	2	37	**
1959	0	0	0	0	*	0	0	7	44	***
1960	0	0	0	0	*	0	0	7	51	***
1961	0	0	2	2	*	0	0	17	68	****
1962	0	0	0	2	*	0	0	10	78	****
1963	0	0	0	2	*	0	0	11	89	*****
1964	0	0	1	3	*	0	0	15	104	*****
1965	0	0	0	3	*	0	0	18	122	*****
1966	0	0	0	3	*	0	0	23	145	*****
1967	0	0	1	4	*	0	0	32	177	*****
1968	0	0	4	6	*	2	0	12	191	*****
1969	0	0	1	9	*	2	0	19	212	*****
1970	0	0	6	15	*	2	0	13	227	*****
1971	0	0	4	17	*	0	1	22	250	*****
1972	0	0	5	24	*	0	0	26	276	*****
1973	0	0	6	30	*	0	0	43	319	*****
1974	0	0	8	38	*	0	0	38	357	*****
1975	0	0	9	47	*	0	0	43	400	*****
TOTAL				47		TOTAL			400	

CITY WINNIPEG

POPULATION = 550000

GROWTH(1966-73) = 10%

YEAR	410-420 MHZ			450-470 MHZ				
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	1
1957	0	0	0	0	*	0	0	1
1958	0	0	0	0	*	0	0	1
1959	0	0	0	0	*	0	0	2
1960	0	0	0	0	*	0	0	1
1961	0	0	0	0	*	0	0	0
1962	0	0	0	0	*	0	0	1
1963	0	0	0	0	*	0	0	3
1964	0	0	0	0	*	0	0	7
1965	0	0	0	0	*	0	0	17
1966	0	0	0	0	*	0	0	17
1967	0	0	0	0	*	1	0	0
1968	0	0	0	0	*	0	0	1
1969	0	0	0	0	*	0	0	5
1970	0	0	0	0	*	0	0	3
1971	0	0	0	0	*	0	0	6
1972	0	0	0	0	*	0	0	12
1973	0	0	0	0	*	0	0	13
1974	0	0	0	0	*	0	0	18
1975	0	0	0	0	*	0	0	9
	TOTAL	0			TOTAL	85		

CITY WINNIPEG

POPULATION= 560000

GROWTH(1966-73)= 10%

YEAR	BANDS 2 TO 6					ALL BANDS				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL		
1956	0	0	25	25	*	0	0	24	24	*
1957	0	0	5	33	*	0	0	5	34	*
1958	0	4	3	40	*	0	4	3	41	**
1959	0	0	9	49	*	0	0	9	50	**
1960	0	0	8	57	*	0	0	8	58	**
1961	0	0	19	76	*	0	0	19	77	***
1962	0	0	11	87	*	0	0	11	88	***
1963	0	0	14	101	*	0	0	14	102	***
1964	0	0	26	127	*	0	0	26	128	****
1965	0	0	18	145	*	0	0	18	145	*****
1966	0	0	23	168	*	0	0	23	169	*****
1967	1	0	33	202	*	1	0	35	205	*****
1968	2	0	22	226	*	2	0	22	229	*****
1969	2	0	25	253	*	3	0	27	259	*****
1970	2	0	22	277	*	2	0	26	277	*****
1971	0	1	34	312	*	0	1	35	323	*****
1972	0	0	43	355	*	0	0	47	370	*****
1973	0	0	63	418	*	0	0	67	437	*****
1974	0	0	56	464	*	0	0	78	515	*****
1975	0	0	64	546	*	0	0	69	564	*****
	TOTAL		548		TOTAL		564			

CITY EDMONTON

POPULATION = 518000

GROWTH(1966-73) = 22%

YEAR	30-50 MHZ				136-144 MHZ			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL

1956	0	0	2	2	*	0	0	0	0	*
------	---	---	---	---	---	---	---	---	---	---

1957	0	0	0	2	*	0	0	0	0	*
------	---	---	---	---	---	---	---	---	---	---

1958	0	0	0	2	*	0	0	0	0	*
------	---	---	---	---	---	---	---	---	---	---

1959	0	0	0	2	*	0	0	0	0	*
------	---	---	---	---	---	---	---	---	---	---

1960	0	0	0	2	*	0	0	0	0	*
------	---	---	---	---	---	---	---	---	---	---

1961	0	0	0	2	*	0	0	1	1	*
------	---	---	---	---	---	---	---	---	---	---

1962	0	0	0	2	*	0	0	0	1	*
------	---	---	---	---	---	---	---	---	---	---

1963	0	0	0	2	*	0	0	0	1	*
------	---	---	---	---	---	---	---	---	---	---

1964	0	0	1	3	*	0	0	0	1	*
------	---	---	---	---	---	---	---	---	---	---

1965	0	0	1	4	*	0	0	0	1	*
------	---	---	---	---	---	---	---	---	---	---

1966	0	0	0	4	*	0	0	1	2	*
------	---	---	---	---	---	---	---	---	---	---

1967	0	0	2	6	*	0	0	0	2	*
------	---	---	---	---	---	---	---	---	---	---

1968	0	0	4	10	*	0	0	8	10	*
------	---	---	---	----	---	---	---	---	----	---

1969	0	0	1	11	*	0	0	1	11	*
------	---	---	---	----	---	---	---	---	----	---

1970	0	0	1	12	*	0	0	3	14	*
------	---	---	---	----	---	---	---	---	----	---

1971	0	0	6	16	*	0	0	4	18	*
------	---	---	---	----	---	---	---	---	----	---

1972	0	0	3	21	*	0	0	8	26	**
------	---	---	---	----	---	---	---	---	----	----

1973	0	0	11	32	*	0	0	0	26	**
------	---	---	----	----	---	---	---	---	----	----

1974	0	0	16	42	*	0	0	3	29	**
------	---	---	----	----	---	---	---	---	----	----

1975	0	0	20	62	*	0	0	17	45	***
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TOTAL 52

TOTAL 46

CITY EDMONTON

POPULATION = 515000

GROWTH (1956-73) = 22%

YEAR	148-150.6 MHZ				150.6-174 MHZ				
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL	
1956	0	0	1	1	*	0	0	18	
1957	0	0	0	1	*	0	0	19	
1958	0	0	0	1	*	0	0	21	
1959	0	0	0	1	*	0	0	31	
1960	0	0	0	1	*	0	0	37	
1961	0	0	0	1	*	0	0	56	
1962	0	0	0	1	*	0	0	64	
1963	0	0	2	3	*	0	0	86	
1964	0	0	0	3	*	0	0	100	
1965	0	0	6	3	*	0	0	121	
1966	0	0	0	3	*	0	0	157	
1967	0	0	1	4	*	0	0	191	
1968	0	0	3	7	*	0	0	222	
1969	0	0	0	7	*	0	0	240	
1970	0	0	1	8	*	0	0	281	
1971	0	0	0	8	*	0	0	321	
1972	0	0	2	10	*	0	0	369	
1973	0	0	23	33	*	0	0	420	
1974	0	0	4	37	*	0	0	466	
1975	0	0	3	40	*	0	0	492	
TOTAL	40				TOTAL	492			

CITY EDMONTON

POPULATION = 518000

GROWTH (1956-73) = 22%

YEAR	410-420 MHZ				450-470 MHZ				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL	
1956	0	0	0	0	*	0	0	1	
1957	0	0	0	0	*	0	0	1	
1958	0	0	0	0	*	0	0	1	
1959	0	0	0	0	*	0	0	1	
1960	0	0	0	0	*	0	0	1	
1961	0	0	0	0	*	0	0	1	
1962	0	0	0	0	*	0	0	2	
1963	0	0	0	0	*	0	0	3	
1964	0	0	0	0	*	0	0	4	
1965	0	0	0	0	*	0	0	6	
1966	0	0	0	0	*	0	0	13	
1967	0	0	0	0	*	0	0	17	
1968	0	0	0	0	*	0	0	21	
1969	0	0	0	0	*	0	0	26	
1970	0	0	4	4	*	0	0	35	
1971	0	0	1	5	*	0	0	32	
1972	0	0	1	6	*	0	0	24	
1973	0	0	8	14	*	0	0	27	
1974	0	0	8	22	*	0	0	25	
1975	0	0	7	29	*	0	0	18	
TOTAL	29				TOTAL	161			

CITY EDMONTON

POPULATION = 518000

GROWTH (1966-73) = 22%

YEAR	BANDS 2 TO 6				ALL BANDS			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	20	20	*	0	0	22
1957	0	0	1	21	*	0	0	1
1958	0	0	2	23	*	0	0	2
1959	0	0	10	33	*	0	0	10
1960	0	0	6	39	*	0	0	6
1961	0	0	21	60	*	0	0	21
1962	0	0	8	68	*	0	0	8
1963	0	0	25	93	*	0	0	25
1964	0	0	15	108	*	0	0	16
1965	0	0	23	131	*	0	0	24
1966	0	0	44	175	*	0	0	44
1967	0	0	39	214	*	0	0	41
1968	0	0	46	260	*	0	0	50
1969	0	0	24	294	*	0	0	25
1970	0	0	56	342	*	0	0	54
1971	0	0	77	419	*	0	0	83
1972	0	0	83	502	*	0	0	86
1973	0	0	104	611	*	0	0	120
1974	0	0	80	597	*	0	0	96
1975	0	0	71	768	*	0	0	91
	TOTAL		758		TOTAL		830	

CITY OF QUEBEC

POPULATION = 493000

GROWTH (1966-73) = 13%

YEAR	30-50 MHZ				136-144 MHZ			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	1	1	*	0	0	0
1957	0	0	0	1	*	0	0	0
1958	0	0	0	1	*	0	0	0
1959	0	0	0	1	*	0	0	0
1960	0	0	0	1	*	0	0	0
1961	0	0	0	1	*	0	0	0
1962	0	0	2	3	*	0	0	0
1963	0	0	1	4	*	0	0	0
1964	0	0	1	5	*	0	0	0
1965	0	0	2	7	*	0	0	0
1966	0	0	0	7	*	0	0	0
1967	0	0	1	8	*	0	0	0
1968	0	0	1	9	*	0	0	3
1969	0	0	4	13	*	0	0	1
1970	0	0	0	13	*	0	0	1
1971	0	0	3	16	*	0	0	4
1972	0	0	4	20	*	0	0	3
1973	0	0	2	22	*	0	0	5
1974	0	0	5	30	*	0	0	16
1975	0	0	5	35	*	0	0	2
	TOTAL		35		TOTAL		37	

POPULATION = 493000

GROWTH (1966-73) = 13%

148-150.8 MHz

YEAR FCC IRAC DUC TOTAL

150.8-174 MHz

FCC IRAC DUC TOTAL

YEAR	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	28
1957	0	0	0	0	*	0	0	6
1958	0	0	0	0	*	0	0	1
1959	0	0	0	0	*	0	3	6
1960	0	0	0	0	*	0	0	9
1961	0	0	0	0	*	0	0	7
1962	0	0	0	0	*	0	0	10
1963	0	0	3	3	*	0	0	17
1964	0	0	0	3	*	0	0	27
1965	0	0	10	13	*	0	0	24
1966	0	0	3	10	*	0	0	28
1967	0	0	3	19	*	0	0	18
1968	0	0	1	20	*	0	0	16
1969	0	0	0	20	*	0	0	28
1970	0	0	3	23	*	0	0	25
1971	0	0	1	24	*	0	0	32
1972	0	0	3	27	*	0	0	33
1973	0	0	2	29	*	0	0	16
1974	0	0	2	31	*	0	0	38
1975	0	0	1	32	*	0	0	25
	TOTAL		32		TOTAL		397	

CITY QUEBEC

POPULATION = 493000

GROWTH (1966-73) = 13%

YEAR	410-420 MHZ				450-470 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	0
1957	0	0	0	0	*	0	0	0
1958	0	0	0	0	*	0	0	1
1959	0	0	0	0	*	0	0	1
1960	0	0	0	0	*	0	0	1
1961	0	0	0	0	*	0	0	1
1962	0	0	0	0	*	0	0	1
1963	0	0	3	0	*	0	0	5
1964	0	0	0	0	*	0	0	7
1965	0	0	0	0	*	0	0	7
1966	0	0	0	0	*	0	0	7
1967	0	0	0	0	*	0	0	7
1968	0	0	0	0	*	0	0	7
1969	0	0	0	0	*	0	0	7
1970	0	0	0	0	*	0	0	9
1971	0	0	0	0	*	0	0	24
1972	0	0	0	0	*	0	0	35
1973	0	0	2	2	*	0	0	37
1974	0	0	3	5	*	0	0	50
1975	0	0	0	5	*	0	0	55
TOTAL		5			TOTAL		55	

CITY OF QUEBEC

POPULATION = 493000

GROWTH (1966-73) = 13%

BANDS 2 TO 6

YEAR FCC IRAC DOC TOTAL

ALL BANDS

FCC IRAC DOC TOTAL

1956 0 0 28 20 * 0 0 29 29 *

1957 0 0 6 34 * 0 0 6 35 **

1958 0 0 2 36 * 0 0 2 37 **

1959 0 3 6 45 * 0 3 6 46 **

1960 0 0 9 54 * 0 0 9 55 **

1961 0 0 7 61 * 0 0 7 62 **

1962 0 0 10 71 * 0 0 12 74 ***

1963 0 0 24 95 * 0 0 25 99 ***

1964 0 0 29 124 * 0 0 30 129 ****

1965 0 0 34 155 * 0 0 36 165 *****

1966 0 0 31 189 * 0 0 31 196 *****

1967 0 0 21 210 * 0 0 22 218 *****

1968 0 0 20 230 * 0 0 21 239 *****

1969 0 0 29 259 * 0 0 33 272 *****

1970 0 0 31 290 * 0 0 31 303 *****

1971 0 0 52 342 * 0 0 55 358 *****

1972 0 0 50 392 * 0 0 54 412 *****

1973 0 0 27 419 * 0 0 29 441 *****

1974 0 0 74 493 * 0 0 82 523 *****

1975 0 0 33 526 * 0 0 38 561 *****

TOTAL 526

TOTAL 561

CITY CALGARY

POPULATION = 431000

GROWTH(1966-73) = 30%

YEAR	30-50 MHZ				136-144 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	0
1957	0	0	0	0	*	0	0	0
1958	0	0	0	0	*	0	0	0
1959	0	0	0	0	*	0	0	0
1960	0	0	0	0	*	0	0	0
1961	0	0	0	0	*	0	0	0
1962	0	0	1	1	*	0	0	0
1963	0	0	0	1	*	0	0	0
1964	0	0	1	2	*	0	0	0
1965	0	0	0	2	*	0	0	2
1966	0	0	2	4	*	0	0	2
1967	0	0	1	5	*	0	0	2
1968	0	0	3	6	*	0	0	7
1969	0	0	2	10	*	0	0	9
1970	0	0	4	14	*	0	0	9
1971	0	0	5	19	*	0	0	11
1972	0	0	12	31	*	0	0	17
1973	0	0	10	41	*	0	0	27
1974	0	0	19	60	*	0	0	33
1975	0	0	14	74	*	0	0	52
	TOTAL		74		TOTAL		52	

CITY CALGARY

POPULATION = 431000

GROWTH (1966-73) = 30%

YEAR	FCC	148-150.8 MHZ			150.8-174 MHZ		
		IRAC	DUC	TOTAL	FCC	IRAC	DUC

1956	0	0	0	0	*	0	0	24	24	**
------	---	---	---	---	---	---	---	----	----	----

1957	0	0	0	0	*	0	0	6	30	**
------	---	---	---	---	---	---	---	---	----	----

1958	0	0	0	0	*	0	0	2	32	**
------	---	---	---	---	---	---	---	---	----	----

1959	0	0	0	0	*	0	0	5	37	**
------	---	---	---	---	---	---	---	---	----	----

1960	0	0	0	0	*	0	0	9	46	***
------	---	---	---	---	---	---	---	---	----	-----

1961	0	0	0	0	*	0	0	6	52	***
------	---	---	---	---	---	---	---	---	----	-----

1962	0	0	2	2	*	0	0	20	72	****
------	---	---	---	---	---	---	---	----	----	------

1963	0	0	4	5	*	0	0	13	85	*****
------	---	---	---	---	---	---	---	----	----	-------

1964	0	0	1	7	*	0	0	14	99	*****
------	---	---	---	---	---	---	---	----	----	-------

1965	0	0	0	7	*	0	0	20	119	*****
------	---	---	---	---	---	---	---	----	-----	-------

1966	0	0	1	6	*	0	0	25	144	*****
------	---	---	---	---	---	---	---	----	-----	-------

1967	0	0	1	9	*	0	0	33	177	*****
------	---	---	---	---	---	---	---	----	-----	-------

1968	0	0	2	11	*	0	0	35	212	*****
------	---	---	---	----	---	---	---	----	-----	-------

1969	0	0	0	11	*	0	0	13	225	*****
------	---	---	---	----	---	---	---	----	-----	-------

1970	0	0	0	11	*	0	0	30	255	*****
------	---	---	---	----	---	---	---	----	-----	-------

1971	0	0	0	11	*	0	0	29	284	*****
------	---	---	---	----	---	---	---	----	-----	-------

1972	0	0	4	15	*	0	0	47	331	*****
------	---	---	---	----	---	---	---	----	-----	-------

1973	0	0	4	14	*	0	0	44	375	*****
------	---	---	---	----	---	---	---	----	-----	-------

1974	0	0	16	35	*	0	0	42	417	*****
------	---	---	----	----	---	---	---	----	-----	-------

1975	0	0	7	42	*	0	0	37	454	*****
------	---	---	---	----	---	---	---	----	-----	-------

TOTAL 42

TOTAL 454

CITY CALGARY

POPULATION = 431000 GROWTH(1966-73) = 30%

YEAR	410-420 MHz				450-470 MHz			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	0
1957	0	0	0	0	*	0	0	0
1958	0	0	0	0	*	0	0	0
1959	0	0	0	0	*	0	0	0
1960	0	0	0	0	*	0	0	0
1961	0	0	0	0	*	0	0	0
1962	0	0	0	0	*	0	0	0
1963	0	0	0	0	*	0	0	0
1964	0	0	0	0	*	0	0	0
1965	0	0	0	0	*	0	0	0
1966	0	0	0	0	*	0	0	2
1967	0	0	0	0	*	0	0	2
1968	0	0	0	0	*	0	0	5
1969	0	0	0	0	*	0	0	11
1970	0	0	2	2	*	0	0	14
1971	0	0	0	2	*	0	0	20
1972	0	0	4	6	*	0	0	13
1973	0	0	2	8	*	0	0	59
1974	0	0	3	11	*	0	0	79
1975	0	0	9	20	*	0	0	97
	TOTAL		20		TOTAL		97	

CITY CALGARY

Congestion 1982

POPULATION = 431000

GROWTH (1966-73) = 30%

YEAR	BANDS 2 TO 6			ALL BANDS			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC

1956	0	0	24	24	*	0	0	24	24	*
1957	0	0	6	30	*	0	0	6	30	*
1958	0	0	2	32	*	0	0	2	32	*
1959	0	0	5	37	*	0	0	5	37	**
1960	0	0	9	46	*	0	0	9	46	**
1961	0	0	6	52	*	0	0	6	52	**
1962	0	0	22	74	*	0	0	23	75	***
1963	0	0	17	91	*	0	0	17	92	***
1964	0	0	15	105	*	0	0	16	108	****
1965	0	0	22	128	*	0	0	22	130	****
1966	0	0	28	156	*	0	0	30	160	*****
1967	0	0	34	190	*	0	0	35	195	*****
1968	0	0	49	235	*	0	0	52	247	*****
1969	0	0	17	256	*	0	0	19	266	*****
1970	0	0	35	291	*	0	0	39	305	*****
1971	0	0	37	328	*	0	0	42	347	*****
1972	0	0	74	402	*	0	0	86	433	*****
1973	0	0	86	488	*	0	0	96	525	*****
1974	0	0	87	575	*	0	0	106	635	*****
1975	0	0	90	665	*	0	0	104	739	*****
	TOTAL		565			TOTAL		739		

CITY LONDON

POPULATION = 293000

GROWTH(1966-73) = 15%

YEAR	30-50 MHZ				138-144 MHZ			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	6	5	*	0	0	0
1957	0	0	1	7	*	0	0	0
1958	0	0	0	7	*	0	0	0
1959	0	0	0	7	*	0	0	0
1960	0	0	0	7	*	0	0	0
1961	0	0	6	13	*	0	0	0
1962	0	0	0	13	*	0	0	0
1963	0	0	0	13	*	0	0	0
1964	0	0	1	14	*	0	0	0
1965	0	0	2	16	*	0	0	0
1966	0	0	6	22	*	0	0	0
1967	2	0	14	36	*	0	0	0
1968	5	0	4	43	*	0	0	0
1969	7	0	19	74	*	0	0	0
1970	11	0	8	93	*	0	0	1
1971	7	0	15	115	*	0	0	3
1972	2	0	32	149	*	0	0	30
1973	0	0	13	162	*	0	0	32
1974	0	0	16	178	*	0	0	45
1975	0	0	18	196	*	0	0	59
	TOTAL		196		TOTAL		59	

CITY LONDON

POPULATION = 293000

GROWTH(1966-73) = 15%

YEAR	148-150.8 MHZ			150.8-174 MHZ						
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL		
1956	0	0	0	0	*	0	2	36	40	***
1957	0	0	0	0	*	0	0	4	44	***
1958	0	0	0	0	*	0	0	2	46	***
1959	0	0	0	0	*	0	0	10	56	***
1960	0	0	0	0	*	0	0	17	73	****
1961	0	0	4	4	*	0	0	18	91	*****
1962	0	0	0	4	*	0	0	10	101	*****
1963	0	0	0	4	*	0	0	17	118	*****
1964	0	0	0	4	*	0	0	27	145	*****
1965	0	0	0	4	*	2	1	31	179	*****
1966	0	1	0	5	*	0	1	31	211	*****
1967	0	0	2	7	*	3	0	30	244	*****
1968	0	0	4	11	*	8	0	23	275	*****
1969	0	0	4	15	*	3	0	22	300	*****
1970	0	0	3	18	*	9	0	17	326	*****
1971	0	0	5	23	*	12	2	20	360	*****
1972	0	0	1	24	*	7	0	27	394	*****
1973	0	0	3	27	*	0	0	40	434	*****
1974	0	0	4	31	*	0	1	54	489	*****
1975	0	0	0	31	*	0	0	33	522	*****
TOTAL				31					522	

CITY LONDON

POPULATION = 293000

GROWTH(1966-73) = 15%

YEAR	410-420 MHZ			450-470 MHZ				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	0	0	*	0	0	4
1957	0	0	0	0	*	0	0	4
1958	0	0	0	0	*	0	0	4
1959	0	0	0	0	*	0	0	4
1960	0	0	0	0	*	0	0	4
1961	0	0	0	0	*	0	0	4
1962	0	0	0	0	*	0	0	3
1963	0	0	0	0	*	0	0	7
1964	0	0	0	0	*	0	0	3
1965	0	0	0	0	*	0	0	10
1966	0	0	0	0	*	0	0	12
1967	0	0	0	0	*	0	0	12
1968	0	0	0	0	*	1	0	2
1969	0	0	0	0	*	0	0	19
1970	0	0	2	2	*	0	0	3
1971	0	0	0	2	*	4	0	8
1972	0	0	7	9	*	4	0	42
1973	0	0	3	12	*	0	0	13
1974	0	0	0	12	*	0	0	22
1975	0	0	12	24	*	0	0	18
	TOTAL		24		TOTAL		95	

CITY LONDON

POPULATION = 293000

GROWTH (1966-73) = 15%

BANDS 2 TO 6

ALL BANDS

YEAR	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
------	-----	------	-----	-------	-----	------	-----	-------

1955	0	2	42	44	*	0	2	48	50	**
1957	0	0	4	46	*	0	0	5	55	**
1958	0	0	2	50	*	0	0	2	57	**
1959	0	0	10	60	*	0	0	10	67	**
1960	0	0	17	77	*	0	0	17	84	***
1961	0	0	22	99	*	0	0	28	112	****
1962	0	0	13	112	*	0	0	13	125	****
1963	0	0	17	129	*	0	0	17	142	*****
1964	0	0	30	159	*	0	0	31	173	*****
1965	2	1	31	193	*	2	1	33	209	*****
1966	0	2	33	226	*	0	2	39	250	*****
1967	3	0	32	263	*	5	0	46	301	*****
1968	9	0	29	301	*	15	0	33	349	*****
1969	3	0	30	334	*	10	0	49	408	*****
1970	9	0	26	359	*	20	0	34	462	*****
1971	16	2	36	423	*	23	2	51	538	*****
1972	11	0	65	496	*	13	0	97	648	*****
1973	3	0	61	560	*	0	0	74	722	*****
1974	0	1	93	654	*	0	1	109	832	*****
1975	0	0	77	731	*	0	0	95	927	*****
		TOTAL	731			TOTAL	927			

CITY HALIFAX

POPULATION = 222000

GROWTH (1966-73) = 6%

YEAR	50-50 MHZ				136-144 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	0
1957	0	0	0	0	*	0	0	0
1958	0	0	0	0	*	0	0	0
1959	0	0	0	0	*	0	0	0
1960	0	0	0	0	*	0	0	0
1961	0	0	3	3	*	0	0	0
1962	0	0	0	3	*	0	0	0
1963	0	0	1	4	*	0	0	0
1964	0	0	2	6	*	0	0	0
1965	0	0	2	8	*	0	0	0
1966	0	0	5	13	*	0	0	0
1967	0	0	5	18	*	0	0	0
1968	0	0	7	25	*	0	0	0
1969	0	0	4	29	*	0	0	10
1970	0	0	8	37	*	0	0	10
1971	0	0	5	42	*	0	0	10
1972	0	0	4	46	*	0	0	13
1973	0	0	0	46	*	0	0	7
1974	0	0	3	49	*	0	0	20
1975	0	0	2	51	*	0	0	35
	TOTAL		51		TOTAL		36	

CITY HALIFAX

POPULATION = 222000

GROWTH(1966-73) = 6%

BANDS 2 TO 6

ALL BANDS

YEAR	BANDS 2 TO 6					ALL BANDS				
	FCC	IRAC	DUC	TOTAL	*	FCC	IRAC	DUC	TOTAL	*

1956	0	0	16	16	*	0	0	16	16	*
------	---	---	----	----	---	---	---	----	----	---

1957	0	0	5	21	*	0	0	5	21	*
------	---	---	---	----	---	---	---	---	----	---

1958	0	0	8	29	*	0	0	8	29	*
------	---	---	---	----	---	---	---	---	----	---

1959	0	0	3	32	*	0	0	3	32	*
------	---	---	---	----	---	---	---	---	----	---

1960	0	0	9	41	*	0	0	9	41	**
------	---	---	---	----	---	---	---	---	----	----

1961	0	0	12	55	*	0	0	15	56	**
------	---	---	----	----	---	---	---	----	----	----

1962	0	0	9	62	*	0	0	9	65	**
------	---	---	---	----	---	---	---	---	----	----

1963	0	0	7	69	*	0	0	8	73	***
------	---	---	---	----	---	---	---	---	----	-----

1964	0	0	11	80	*	0	0	13	85	***
------	---	---	----	----	---	---	---	----	----	-----

1965	0	0	16	96	*	0	0	18	104	***
------	---	---	----	----	---	---	---	----	-----	-----

1966	0	0	15	111	*	0	0	20	124	****
------	---	---	----	-----	---	---	---	----	-----	------

1967	0	0	15	126	*	0	0	20	144	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1968	0	0	17	143	*	0	0	24	168	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1969	0	0	26	169	*	0	0	30	198	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1970	0	0	25	194	*	0	0	33	231	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1971	0	0	26	220	*	0	0	31	262	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1972	0	0	45	265	*	0	0	49	311	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1973	0	0	35	360	*	0	0	35	346	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1974	0	0	94	394	*	0	0	97	443	*****
------	---	---	----	-----	---	---	---	----	-----	-------

1975	0	0	43	437	*	0	0	45	488	*****
------	---	---	----	-----	---	---	---	----	-----	-------

TOTAL 437

TOTAL 488

CITY HALIFAX

POPULATION = 222000

GROWTH(1966-73) = 6%

YEAR	145-150.8 MHZ			150.8-174 MHZ				
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL
1956	0	0	0	0	*	0	0	15
1957	0	0	0	0	*	0	0	5
1958	0	0	0	0	*	0	0	7
1959	0	0	0	0	*	0	0	31
1960	0	0	0	0	*	0	0	40
1961	0	0	0	0	*	0	0	12
1962	0	0	2	2	*	0	0	59
1963	0	0	0	2	*	0	0	5
1964	0	0	0	2	*	0	0	75
1965	0	0	0	2	*	0	0	41
1966	0	0	1	3	*	0	0	14
1967	0	0	1	4	*	0	0	119
1968	0	0	0	4	*	0	0	16
1969	0	0	6	10	*	0	0	10
1970	0	0	6	10	*	0	0	19
1971	0	0	1	11	*	0	0	25
1972	0	0	2	13	*	0	0	33
1973	0	0	3	16	*	0	0	20
1974	0	0	6	24	*	0	0	49
1975	0	0	3	27	*	0	0	38
	TOTAL		27		TOTAL		329	

CITY HALIFAX

POPULATION = 222500

GROWTH (1966-73) = 6%

YEAR	410-420 MHz				450-470 MHz			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL

1956	0	0	0	0	*	0	0	0
1957	0	0	0	0	*	0	0	0
1958	0	0	0	0	*	0	0	1
1959	0	0	0	0	*	0	0	0
1960	0	0	0	0	*	0	0	0
1961	0	0	0	0	*	0	0	1
1962	0	0	0	0	*	0	0	0
1963	0	0	0	0	*	0	0	2
1964	0	0	0	0	*	0	0	0
1965	0	0	0	0	*	0	0	0
1966	0	0	0	0	*	0	0	0
1967	0	0	0	0	*	0	0	0
1968	0	0	0	0	*	0	0	1
1969	0	0	0	0	*	0	0	4
1970	0	0	0	0	*	0	0	6
1971	0	0	0	0	*	0	0	10
1972	0	0	3	3	*	0	0	4
1973	0	0	0	3	*	0	0	5
1974	0	0	6	9	*	0	0	16
1975	0	0	0	9	*	0	0	36

TOTAL

9

TOTAL

36

CITY KITCHNER

POPULATION = 235000

GROWTH (1966-73) = 23%

YEAR	30-50 MHZ				138-144 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	12	12	*	0	0	0
1957	0	0	1	13	*	0	0	0
1958	0	0	0	13	*	0	0	0
1959	0	0	4	17	*	0	0	0
1960	0	0	0	17	*	0	0	0
1961	0	0	1	18	*	0	0	0
1962	0	0	0	18	*	0	0	0
1963	0	0	0	18	*	0	0	0
1964	0	0	2	20	*	0	0	0
1965	0	0	5	25	*	0	0	0
1966	0	0	15	40	*	0	0	0
1967	0	0	15	55	*	0	0	0
1968	0	0	14	59	*	0	0	2
1969	0	0	18	87	*	0	0	1
1970	1	0	14	102	*	0	0	23
1971	0	0	28	130	*	0	0	39
1972	0	0	35	165	*	0	0	51
1973	0	0	19	184	*	0	0	62
1974	0	0	18	202	*	0	0	78
1975	0	0	25	227	*	0	0	92
	TOTAL		267		TOTAL		92	

CITY KITCHEN

POPULATION = 235000

GROWTH(1966-73) = 23%

YEAR	148-150.5 MHZ				150.5-174 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	66
1957	0	0	1	1	*	0	0	8
1958	0	0	0	1	*	0	0	12
1959	0	0	0	1	*	0	0	23
1960	0	0	0	1	*	0	0	17
1961	0	0	4	5	*	0	0	32
1962	0	0	1	6	*	0	0	28
1963	0	0	3	9	*	0	0	50
1964	0	0	0	9	*	0	0	51
1965	0	0	1	10	*	0	0	53
1966	0	0	4	14	*	0	0	36
1967	0	0	7	21	*	0	0	412
1968	0	0	11	32	*	1	0	40
1969	0	0	5	46	*	0	0	31
1970	0	0	7	47	*	1	0	18
1971	0	0	8	55	*	1	0	30
1972	0	0	5	61	*	2	0	51
1973	0	0	9	70	*	0	0	32
1974	0	0	4	74	*	0	0	52
1975	0	0	3	77	*	0	0	31
	TOTAL		77		TOTAL		702	

CITY KITCHENER

POPULATION = 235000

GROWTH (1966-73) = 23%

YEAR	410-420 MHZ				450-470 MHZ			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	0	0	*	0	0	6
1957	0	0	0	0	*	0	0	6
1958	0	0	0	0	*	0	0	8
1959	0	0	0	0	*	0	0	9
1960	0	0	0	0	*	0	0	12
1961	0	0	0	0	*	0	0	15
1962	0	0	0	0	*	0	0	16
1963	0	0	0	0	*	0	0	16
1964	0	0	0	0	*	0	0	18
1965	0	0	0	0	*	0	0	22
1966	0	0	0	0	*	0	0	31
1967	0	0	0	0	*	0	0	35
1968	0	0	0	0	*	0	0	45
1969	0	0	0	0	*	0	0	72
1970	0	0	2	2	*	0	0	46
1971	0	0	1	3	*	0	0	41
1972	0	0	7	10	*	2	0	46
1973	0	0	3	13	*	0	0	80
1974	0	0	10	23	*	0	0	100
1975	0	0	23	46	*	0	0	37
	TOTAL		46		TOTAL		424	

POPULATION = 147000

GROWTH (1966-73) = 12%

YEAR	30-50 MHZ				138-144 MHZ				
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL	
1955	0	0	3	3	*	0	0	0	
1957	0	0	0	3	*	0	0	0	
1958	0	0	0	3	*	0	0	0	
1959	0	0	0	3	*	0	0	0	
1960	0	0	0	3	*	0	0	0	
1961	0	0	0	3	*	0	0	0	
1962	0	0	1	4	*	0	0	0	
1963	0	0	0	4	*	0	0	0	
1964	0	0	0	4	*	0	0	0	
1965	0	0	1	5	*	0	0	0	
1966	0	0	1	6	*	0	0	0	
1967	0	0	2	8	*	0	0	0	
1968	0	0	2	10	*	0	0	6	
1969	0	0	0	10	*	0	0	7	
1970	0	0	3	13	*	0	0	8	
1971	0	0	2	15	*	0	0	5	
1972	0	0	5	20	*	0	0	8	
1973	0	0	2	22	*	0	0	8	
1974	0	0	4	25	*	0	0	9	
1975	0	0	6	36	*	0	0	11	
TOTAL	32				TOTAL	11			

CITY KITCHNER

POPULATION = 235000

GROWTH (1965-73) = 23%

BANDS 2 TO 6

ALL BANDS

YEAR FCC IRAC DUC TOTAL

FCC IRAC DUC TOTAL

1956 0 0 72 72 * 0 0 84 84 ***

1957 0 0 9 81 * 0 0 10 94 ***

1958 0 0 14 93 * 0 0 14 108 ****

1959 0 0 24 119 * 0 0 28 136 ****

1960 0 0 20 139 * 0 0 26 156 *****

1961 0 0 39 178 * 0 0 40 196 *****

1962 0 0 30 208 * 0 0 30 226 *****

1963 0 0 53 261 * 0 0 53 279 *****

1964 0 0 53 314 * 0 0 55 334 *****

1965 0 0 58 372 * 0 0 63 397 *****

1966 0 0 49 421 * 0 0 64 461 *****

1967 0 0 47 468 * 0 0 62 523 *****

1968 1 0 63 532 * 1 0 77 601 *****

1969 0 0 67 599 * 0 0 85 686 *****

1970 1 0 95 695 * 2 0 110 798 *****

1971 1 0 93 790 * 1 0 121 920 *****

1972 4 0 122 916 * 4 0 157 1081 *****

1973 0 0 135 1051 * 0 0 154 1235 *****

1974 0 0 162 1233 * 0 0 200 1435 *****

1975 0 0 108 1341 * 0 0 133 1568 *****

TOTAL 1341

TOTAL 1568

CITY REGINA

POPULATION = 147000

GROWTH(1966-73) = 12%

YEAR	148-150.8 MHZ				150.8-174 MHZ				TOTAL	
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL		
1956	0	0	0	0	*	0	0	11	11	*
1957	0	0	0	0	*	0	0	2	13	*
1958	0	0	0	0	*	0	0	4	17	*
1959	0	0	0	0	*	0	0	3	20	**
1960	0	0	0	0	*	0	0	4	24	**
1961	0	0	0	0	*	0	0	9	33	**
1962	0	0	0	0	*	0	0	3	36	**
1963	0	0	1	1	*	0	0	1	37	**
1964	0	0	0	1	*	0	0	8	45	***
1965	0	0	0	1	*	0	0	8	53	***
1966	0	0	0	1	*	0	0	14	67	****
1967	0	0	1	2	*	0	0	10	77	****
1968	0	0	2	4	*	0	0	9	86	*****
1969	0	0	1	5	*	0	0	12	98	*****
1970	0	0	1	6	*	0	0	3	101	*****
1971	0	0	1	7	*	0	0	12	113	*****
1972	0	0	0	7	*	0	0	14	127	*****
1973	0	0	2	9	*	0	0	19	146	*****
1974	0	0	1	10	*	0	0	15	161	*****
1975	0	0	0	10	*	0	0	25	186	*****
TOTAL	10				TOTAL	180				

CITY REGINA

POPULATION = 147000

GROWTH (1966-73) = 12%

YEAR	410-420 MHZ				450-470 MHZ			
	FCC	IRAC	DOC	TOTAL	FCC	IRAC	DOC	TOTAL

1956	0	0	0	0	*	0	0	0	0	*
1957	0	0	0	0	*	0	0	0	0	*
1958	0	0	0	0	*	0	0	0	0	*
1959	0	0	0	0	*	0	0	0	0	*
1960	0	0	0	0	*	0	0	0	0	*
1961	0	0	0	0	*	0	0	0	0	*
1962	0	0	0	0	*	0	0	1	1	*
1963	0	0	0	0	*	0	0	4	5	*
1964	0	0	0	0	*	0	0	0	5	*
1965	0	0	0	0	*	0	0	0	5	*
1966	0	0	0	0	*	0	0	0	5	*
1967	0	0	0	0	*	0	0	0	5	*
1968	0	0	0	0	*	0	0	3	8	*
1969	0	0	0	0	*	0	0	0	8	*
1970	0	0	0	0	*	0	0	2	10	*
1971	0	0	0	0	*	0	0	0	10	*
1972	0	0	0	0	*	0	0	0	10	*
1973	0	0	5	5	*	0	0	4	14	*
1974	0	0	0	5	*	0	0	3	17	*
1975	0	0	0	5	*	0	0	6	23	**

TOTAL

5

TOTAL

23

CITY REGINA

POPULATION = 147000

GROWTH (1956-73) = 12%

BANDS 2 TO 6

ALL BANDS

YEAR	BANDS 2 TO 6				ALL BANDS			
	FCC	IRAC	DUC	TOTAL	FCC	IRAC	DUC	TOTAL
1956	0	0	11	11	*	0	0	14
1957	0	0	2	13	*	0	0	2
1958	0	0	4	17	*	0	0	4
1959	0	0	3	20	*	0	0	3
1960	0	0	4	24	*	0	0	4
1961	0	0	9	33	*	0	0	9
1962	0	0	4	37	*	0	0	5
1963	0	0	6	43	*	0	0	6
1964	0	0	3	51	*	0	0	8
1965	0	0	6	56	*	0	0	4
1966	0	0	14	73	*	0	0	15
1967	0	0	11	84	*	0	0	13
1968	0	0	20	104	*	0	0	22
1969	0	0	14	118	*	0	0	14
1970	0	0	7	125	*	0	0	10
1971	0	0	13	138	*	0	0	15
1972	0	0	14	152	*	0	0	19
1973	0	0	30	182	*	0	0	32
1974	0	0	20	202	*	0	0	24
1975	0	0	33	235	*	0	0	39
	TOTAL		235		TOTAL		267	



86385

QUEEN TK 6553 .S3 1976
Sahay, V.
Rate of channel consumption

Date Due

