ENGINEERING BRIEF

FOR

A CHANGE OF FACILITIES OF

FM BROADCASTING STATION CFMX-FM-1

Applicant

Martin Rosenthal

468 Queen Street East

Suite 101

Toronto, Ontario.

M5A 1T7

PROJECT:	MR-TOR
CHANNEL:	99.1 MHz (CH. 256C_1)
ERP:	100 kW MAX. 60.2 kW AVG.
EHAAT:	284 m

Prepared by

IMAGINEERING LIMITED

95 Barber Greene Road

Toronto, Ontario.

M3C 3E9

12 FEBRUARY 1992

SUMMARY SHEET

APPLICANT:	Martin Rosenthal 468 Queen Street East Suite 101 Toronto, Ontario. M5A 1T7	
	PRESENT	PROPOSED
STATION LOCATION:	Mississauga, Ontario	Toronto, Ontario
STATION CALL:	CFMX-FM-1	CFMX-FM-1
CO-ORDINATES:	43° 35' 38" N.LAT. 79° 38' 02" W.LONG.	43° 38' 56" N.LAT. 79° 22' 55" N.LAT.
TRANSMITTER POWER:	13.7 kW	20.9 kW
TRANSMISSION LINE EFFICIENCY:	97%	93.1%
ANTENNA POWER GAIN:	7.1	5.13
EFFECTIVE RADIATED POWER:	100 kW Max. 43.1 kW Avg.	100 kW Max. 60.2 kW Avg.
EHAAT:	103 m	284 m
CHANNEL NUMBER:	$242C_1$	$256C_1$
FREQUENCY:	96.3 MHz	99.1 MHz

ENGINEERING BRIEF

FOR

A CHANGE OF FACILITIES OF

FM BROADCASTING STATION CFMX-FM-1

1.0 INTRODUCTION

Imagineering Limited, Toronto, Ontario, has been retained by Martin Rosenthal to prepare an Engineering Brief in support of an application to change the facilities of FM broadcasting station CFMX-FM-1, operating, at present, in the city of Mississauga, Ontario.

2.0 DISCUSSION

2.1 Background

CFMX-FM has come a long way since Martin Rosenthal purchased the station from its former owner and licensee. Firstly, the original transmitting facility in Cobourg was completely rebuilt; this included replacement of the building, transmitter, tower, and the installation of high quality antenna and feeder systems. While this resulted in a solid reliable operation in the Cobourg region, further expansion of the service was necessary in order to defray more of the financial losses being incurred by the operation. Martin Rosenthal applied to expand the service into Toronto in 1985, using 97.3 MHz, located on the CN Tower. This application was denied. Subsequently, Mr. Rosenthal applied for and was licensed to use 96.3 MHz. While this was a step in the right direction, there were technical constraints which limited the power level and required the transmitter site to be located in

2.1 Background (continued)

Mississauga, about 20 km from downtown Toronto. It was found in practice that the Mississauga repeater did not provide an adequate signal in the centre of Metropolitan Toronto and other areas with concentrations of highrise buildings due to their distance from the transmitter location. The prevalence of multi-path, occasional first-adjacent interference from WJYE-FM, the incidence of intermodulation interference in the vicinity of the CN Tower and signal fading due to blockage by large buildings, still left a great deal to be desired in the quality of the delivery vehicle for the classical music format. In order to overcome some of the disadvantages stemming from insufficient signal level, CFMX-FM-1 applied for a power increase to 100 kW maximum ERP and, after a testing period to assess potential interference to CILQ-FM, was approved by the Department and licensed by the Commission.

While the five-fold power increase toward Toronto was expected to statistically improve the ability of potential listeners to receive CFMX-FM-1, the results, as reflected in BBM ratings, have been inconsistent, first showing an increase in audience and then showing a decrease. It is concluded that the improvement has not resulted in a significant impact on listenership. Furthermore, the situation is not sufficiently improved to overcome reluctance on the part of many large advertisers to use CFMX-FM-1 to reach the Toronto market. In this regard, sales efforts are frequently hampered by reports that, when a salesperson attempts to tune to CFMX-FM-1 in the office of a potential advertiser in downtown Toronto, the signal is frequently not there.

2.1 Background (continued)

We are now at another watershed in the history of both CFMX-FM and CFMX-FM-1 as they are inseparable in terms of the overall economics of the operation. With the availability of 99.1 MHz, an opportunity now exists to solve the technical problems with reception in Toronto, once and for all.

In addition, coverage of CFMX-FM-1 would be significantly improved enclosing not only the service area now covered but extending to include most of the Niagara Peninsula, the Hamilton area, areas north of Toronto and, notably, areas north-west of Pickering/Ajax which have been excluded from coverage by virtue of the 0.5 mV/m contours of the existing operations just overlapping. (A portion of the coverage from the Cobourg station in the overlap area has a zone of interference in it caused by CKLH-FM. This is shown in Figure 9.) In order to provide reasonably continuous coverage in this highly populated part of Ontario extending some 40-50 km from Lake Ontario northward and which contains many small communities and the town of Uxbridge itself, a certain overlap is proposed and, indeed, unavoidable in that coverage contours are curved; in order to provide coverage in areas north and north-west of the lakeshore requires progressively larger overlap in the southern areas near the lake.

This application represents the opportunity to more effectively tap into the market that was anticipated by both Martin Rosenthal and by the Commission in approving the Mississauga operation in the first place. This did not happen in sufficient numbers to offset operating costs. Mr. Rosenthal believes that approval of

2.1 Background (continued)

this application will not only provide the basis for improved revenue flow and set the stage for the recoupment of operating costs of both the Cobourg station and its Mississauga repeater but also to act as the springboard for expansion of Canada's only commercial, full-time classical music station to other Canadian centres besides those that would be newly served by this proposed operation.

2.2 Technical Issues

There are several technical issues underlying this application for a Change of Facilities, both as they relate to the proposed operation, its relationship with the coverage of CFMX-FM, Cobourg, and the disposition of the 96.3 MHz frequency.

2.2.1 Improved Coverage

As indicated in paragraph 2.1, above, one of the principal reasons for this application is to improve the overall coverage of the station. Examination of the comparative coverage contours in Figure 8 clearly demonstrates that the proposed service area completely encompasses that of CFMX-FM-1 operating from Mississauga. In addition to providing improved coverage to the greater Metropolitan Toronto region, the proposed operation will improve the presently impaired signal in the north-western part of the Niagara Peninsula, and provide service to presently unserved communities such as St.

2.2.1 Improved Coverage (continued)

Catharines, Niagara Falls, Welland, Cambridge and Guelph. The coverage will in fact extend virtually throughout the Niagara Peninsula with the exception of the area around Fort Erie which unavoidably cannot be improved because of the protection requirement to WKLX (FM) in Rochester.

2.2.2 Coverage Overlap

Of prime importance as well, is the coverage of the presently unserved wedge-shaped area north of the town of Ajax between the 0.5 mV/m contour of CFMX-FM, Cobourg, and the 0.5 mV/m contour of the present CFMX-FM-1, Mississauga, operation. This area is shown in Figure 9. This is a relatively highly populated part of Ontario and is desired to be served. Given that there is approximately a 10 decibel reduction in the radiation towards Rochester, the antenna pattern was designed to gradually increase to maximum values to the north-east and north, in order that those areas can be adequately served while at the same time minimizing unnecessary overlap of the two stations along the north shore of Lake Ontario. Examination of the horizontal antenna pattern in Figure 3 will reveal that the radiation increases rapidly from azimuth 60° counterclockwise to 35° in order that the northern part of the unserved wedge-shaped area would be improved to the extent possible. Given that continuous coverage is required at the lakeshore as well as areas north of it, this dictates that a certain amount

2.2.2 Coverage Overlap (continued)

of overlap occur. It is fortuitous that the totally independent requirement to protect Rochester also results in some suppression of the signal along the Lakeshore, towards Cobourg. The rate of increase of the signal northward has been balanced between optimizing coverage, minimizing overlap and protection of Rochester.

2.2.3 Requirement for a High Quality Signal

While extended coverage of the station and saturation of the centre of Metropolitan Toronto is one of the prime objectives of the proposed operation, the improvement in the overall quality of the signal is also a major objective. CFMX-FM-1 broadcasts classical music exclusively and it is a fact that this music format is replete with soft passages, quite periods, pauses and, in many cases, delicate musical passages, during which any imperfection in the delivery vehicle such as multi-path pops, intermodulation and adjacent channel interference, however slight, are annoying. This is in stark contrast to other popular musical formats where "dead air" is unknown and the general level of aural spectral content is extremely high and masks such imperfections. This is readily confirmed by a glance at the level display of a multi-band graphic equalizer on a receiver tuned to a classical music piece and compared with a typical rock piece.

2.2.3 Requirement for a High Quality Signal (continued)

A simple analogy of this type of annoyance is the well used phonograph record. Any scratches, dust in the grooves or static pops are clearly heard and annoying and classical music listeners generally take great pains to take care of their records and purchase high quality components in order to suppress these and other annoyances. In contrast, few rock music enthusiasts place much emphasis on the subtle but rather on power and volume. Though the days of the phonograph record are virtually over, the enjoyment of classical music is not, and the need to deliver it in a "padded, air-ride van" is still essential, now more so than ever, with the audience being used to CD quality in the home.

While it is recognized that any FM broadcast delivery vehicle in an urban environment is subject to degradations due to various propagation mechanisms, it is clear that a high location, positioned so as to minimize shadowing and, hence, multi-path in Toronto's topography of north-south ravines and provision of a high signal level in the urban core where shadowing effects reduce ambient signal strength levels dramatically, will go a long way to solving the delivery quality problems for CFMX-FM-1. The proposed site on First Canadian Place in downtown Toronto provides such a location. An additional consideration is that the proposed site, which is higher and closer to Cobourg than the Mississauga location, will receive an excellent off-air signal from CFMX-FM, with subsequently improved rebroadcasted signal quality.

2.2.4 Reuse of 96.3 MHZ by Another Broadcaster

The discussion in the above paragraph leads one to ask the question as to what use would be made of the frequency if this application is approved and the operation on 96.3 MHz is discontinued.

Certainly the frequency is a useable Toronto frequency. It is a fact that CFMX-FM-1 can be heard generally throughout the area stretching from Burlington through to Scarborough and regions to the north. Notwithstanding the imperfections discussed above, this frequency could be used by any broadcaster offering a more robust popular music format. If the previous CRTC applications for FM broadcast stations in Toronto are any indication, there appears to be significant demand by groups who would broadcast this type of music. The nature of the music itself and the style of delivery of the radio personalities is such that the subtle signal degradations that detract from the enjoyment of classical music, in certain of its forms, would not be a significant disturbance to the more robust forms of music which would appear to be prime candidates for use of 96.3 MHz, should this frequency become available as a result of approval of this application.

3.0 ASSUMPTIONS AND SOURCES OF INFORMATION

This Brief was prepared in accordance with the Department of Communications Broadcast Procedures and Rules, Parts I and III and was based on information contained in the following publications and sources:

1. Canadian FM Broadcasting Allotment Plan, Issue 1991-03-28

2. U.S. FM Channel Allotments and Assignments Within 320 km of the Common Border, Issue 1991-03-28

3. D.O.C. Computer Data for FM Allotments and Assignments dated March 1987, and Updates to January 1992

4. Elevation profiles were drawn on the basis of data obtained from the CRC Topographic Database.

5. Operating parameters for CJBC-4-FM were obtained from DOC FM Station Data Sheet, dated August 21, 1985.

4.0 EQUIPMENT

The list of major items of equipment proposed is included in Appendix 1. In summary, the proposed operation is based on the use of a Kathrein, FM CP, six-bay, panel-type antenna, fed by two Nautel 11 kW transmitters operating in parallel at a total power level of 20.9 kW, via 45 meters of Andrew HJ8-50B coaxial cable.

With the consent of the Department, the Applicant reserves the right to substitute equivalent, DOC-approved equipment at the time of implementation.

5.0 LOCATION AND DESCRIPTION OF ANTENNA SYSTEM

5.1 The transmitter and antenna will be located on the rooftop of First Canadian Place, in downtown Toronto. The geographical co-ordinates of the antenna are:

43° 38' 56" N. Latitude
79° 22' 55" W. Longitude

Note that these co-ordinates have been accurately calculated from EMR Map 30 M/11, and differ from the co-ordinates previously notified for CKO-FM-2.

The site is shown in Figure 1.

5.2 Antenna elevations are illustrated in Figure 2 and are summarized below.

Overall Height of Antenna System
315.2 m above ground level
399.9 m above mean sea level

Average Elevation of Terrain
107.6 m Above mean sea level

Elevation of Centre of Radiation
391.6 m above mean sea level
284 m above average terrain
306.9 m above ground level

5.3 It is proposed to use a six-bay Kathrein type 754154 CP panel antenna. This antenna is designed to operate with a directional pattern, 15% null-fill, and no beam tilt. The horizontal radiation pattern is shown in Figure 3, and the vertical pattern is shown in Figure 4. Parameters describing the gain characteristics of the antenna are as follows:

Vertical Power Gain:	3.09	(4.90 dB)
Horizontal Power Gain:	1.66	(2.21 dB)
Peak Power Gain:	5.13	(7.11 dB)

5.4 The antenna will be fed by approximately 45 m of Andrew 3" HJ8-50B, co-axial transmission line, exhibiting a loss of 0.46 dB/ 100 m. The efficiency of the feed system has been calculated as follows:

Transmission Line Loss:	0.21 dB
Other Losses, connectors, bends, etc.	0.10 dB
TOTAL	0.31 dB

Transmission line system efficiency is 93.1%

6.0 INTERFERENCE ANALYSIS

6.1 IF Relationship

There are no IF related allotments or assignments within 50 km of the proposed operation.

6.2 Harmonic Interference

The second harmonic of 99.1 MHz falls at 198.2 MHz which is within the 198-204 MHz band of television Channel 11. In the downtown Toronto area, the signal of CHCH-TV, Hamilton has a signal level of greater than 74 dBu. BP 23 allows an interfering signal at 1.05 MHz below the television carrier frequency to be approximately 34 dB below the carrier level, or 40 dBu in this case. The maximum signal level from the proposed operation at ground level is 120 dBu. The maximum allowable radiation at second harmonic for a 22 kW transmitter is -86.4 dBc as per RSS 153. This results in a maximum interference level of 33.6 dBu to the Channel 11 signal, which is 6.4 dB below the allowable limit of 40 dBu. Interference to CHCH-TV is therefore not expected to occur.

6.3 Reradiation Interference

The proposed antenna will be mounted on a new 38.1 m support mast on the west side of the First Canadian Place penthouse. Other broadcasting operations which are located on the First Canadian Place rooftop include CKLN-FM mounted on a short pole on the

6.3 Reradiation Interference (continued)

north-east corner of the penthouse, and CIUT-FM mounted on a 48.8 m mast on the east side of the penthouse. In addition, there is a communications and paging antenna support mast estimated to be approximately 43 m high, mounted on the south side of the penthouse. The other nearby broadcast operations are the television and FM antennas mounted on the CN Tower at a distance of 850 m.

With respect to reradiation interference to CKLN-FM and CIUT-FM from the proposed structure, the small separation distance (approximately 25 m) from these operations will result in an insignificant reradiated signal delay and therefore distortion is not expected. It is more probable that the proposed structure could cause some scalloping of the radiation patterns of these operations. It is noted, however, that the proposed structure is much further from the CKLN-FM antenna than is the CIUT-FM support mast, and much further from the CIUT-FM antenna than is the communications mast. Therefore, rippling of the radiation patterns by the proposed structure would be expected to be less than any pattern distortions which already exist.

With respect to reradiation interference from the proposed structure to the broadcast operations on the CN Tower, it is noted that the proposed mast is shorter than both the existing CIUT-FM and paging masts. In addition, since the proposed structure is at least 28° below the main beam of the CN Tower antennas, computer analysis indicates negligible reradiation.

6.3 Reradiation Interference (continued)

With respect to distortion of the proposed radiation pattern due to the CIUT-FM and paging masts co-located on the First Canadian Place rooftop, these masts are located east and south-east, respectively, of the proposed rooftop location and are, therefore, in the proposed pattern null. Pattern distortions are therefore expected to be negligible.

With respect to reradiation delay distortion of the proposed operation's signal from the CN Tower, computer analysis indicates a worst case echo of -20 dB at 6 microsecond delay, corresponding to distortion of approximately 3%. Due to the size of the CN Tower, however, the validity of the computer model is considered suspect. It is noted that the signal of CIUT-FM, which would suffer the same level of distortion, has been critically examined and no impairments were apparent.

6.4 Intermodulation Interference

The 115 dBu and 100 dBu contours are shown in Figure 1. They extend to distances of 300 meters and 9 km, respectively.

Appendix 2 provides a third-order intermodulation analysis. Stations considered included all Toronto allotments and assignments, as well as all allotments receivable in the downtown Toronto area. All third-order products falling within the FM band of which the proposed frequency is a contributor, are listed. In

6.4 Intermodulation Interference (continued)

addition, two computer-generated spectral analysis plots are given. The first plot shows the calculated relative third-order intermod spectrum due to all frequencies excluding 99.1 MHz. The second plot includes 99.1 MHz. It will be noted from the first plot that intermod products fall on all FM band channel frequencies. Comparison of the two plots shows that the inclusion of 99.1 MHz does not modify the spectrum appreciably. It is expected, therefore, that the relocation of CFMX-FM-1 to First Canadian Place will not substantially aggravate the existing intermod situation in downtown Toronto. It will, however, improve the interference situation presently experienced in the Toronto core by CFMX-FM-1 on 96.3 MHz.

6.5 Short Spacing

The Canadian and U.S. Allotment plans were examined for any allotments or assignments which are short spaced to the proposed channel. At full Class C_1 parameters the following stations were found to be short spaced:

6.5 Short Spacing (continued)

Table 1

Short Spacing Analysis

Station	Channel	Distance (km) Actual	Required
WKSE(FM), Niagara Falls, N.Y.	253B	78.1	95
CKWR-FM, Kitchener, On.	254A	94.7	98
WKLX(FM), Rochester, N.Y.	255B	148.2	195
CJBC-4-FM, London, On.	257B	177.7	195

The protection analyses to these stations are shown in Table 2. The protected contours of all stations except CJBC-4-FM were assumed maximum for their class. The protected contour of CJBC-4-FM was calculated based on their actual operating parameters.

For WKSE(FM), the protection is met even though it is not required to protect their service area within Canada. The protection towards CKWR-FM is also met.

Towards WKLX(FM), it was assumed that the allowable radiation is 10.3 dBK at 316.6 meters HAAT. In terms of the 1 mV/m signal contour, this is equivalent to 50 kW/150 m EHAAT which are the allowable operating parameters for the 99.1 MHz Toronto

6.5 Short Spacing (continued)

allotment as given in the FM Allotment Plan. Figure 10 shows the predicted actual interference zone to WKLX (FM) as well as the interference zone which would result from a 50 kW/150 m EHAAT operation.

Towards CJBC-4-FM, it was assumed that maximum radiation of 100 kW is allowed. This is based on the previous situation with CKO-FM-2, where the radiation towards CJBC-4-FM was 100 kW at slightly higher EHAAT. A comparison of the calculated interference zone from the proposed operation and the previous interference zone due to CKO-FM-2 is shown in Figure 11. The proposed interference zone is slightly smaller than the previous existing interference zone.

6.6 Fourth Adjacent

The proposed operation is fourth-adjacent to CKFM-FM, 99.9 MHz, operating from the CN Tower. The maximum difference in ground-level field strengths of the two stations is predicted to be 10 dB. Therefore, fourth adjacent interference is not expected to occur to either CKFM-FM or the applicant.

TABLE 2

PROTECTION ANALYSIS

Protected Station	CH.	Protected to Protection Point Dist. (km)	Protected to Protection Point Az. (°)	NEW to Protection Point Dist. (km)	NEW to Protection Point Az. (°)	NEW to Protection Point HAAT (m)	Int. Per kW (dBu)	Allow. Interf. (dBu)	Allow. Rad. (dBk)	Prop. Rad. (dBk)
WKSE(FM) Niagara Falls, N.Y.	253B	65	336.4	13.1	156.2	316.6	75.9	94	18.1	16.5
CKWR-FM Kitchener, On.	254A	33	77.1	61.7	257.9	287.6	47.8	74	26.2	20.0
WKLX(FM) Rochester, N.Y.	255B	65	231.6	128.5	136.4	316.6	28.8	48	19.2	12.2
		65	251.6	106.8	133.5	316.6	34.1	48	13.9	11.5
		65	271.6	89.9	124.8	316.6	39.2	48	10.3*	9.3
		65	291.6@	83.2	110.5	316.5	41.3	48	10.3*	9.5
		34.3	309.6@	115.8	105.2	316.5	31.5	62.5	31.0	11.0
CJBC-4-FM	257B	63.5	43.6	120.0	255.4	289.9	29.9	48	20.0**	19.8
		63.0	63.6	114.7	244.9	299.1	31.4	48	"	19.3
		62.3	83.6	120.9	234.8	308.0	30.2	48	"	18.5

* Allowable radiation = 10.3 dBk based on 50 kW/150 m equivalence
@ Protected Point on Shore of Lake Ontario
** Allowable radiation = 20 dBk based on previous CKO-FM-2 situation

Rev. 1 13 March 1992

6.7 Exposure to RF Energy

Since there are numerous RF sources transmitting from the First Canadian Place rooftop, including FM broadcast, paging and microwave, it was considered impractical to calculate the RF power density. The existing levels on the rooftop were therefore measured. Levels were also measured at the existing CFMX-FM-1 facilities in Mississauga, since the current operation is similar to the proposed operation (100 kW maximum ERP, 6 bay antenna). The results are as follows:

First Canadian Place:	1.1	mW/cm^2
Existing CFMX-FM-1:	0.4	mW/cm^2
Potential Total on FCP:	1.5	mW/cm^2

The existing maximum levels on the First Canadian Place rooftop in the vicinity of the CIUT-FM antenna already exceed the Safety Code 6 guideline of 1 mW/cm^2. The proposed operation could theoretically increase the level to 1.5 mW/cm^2, although due to the separation of the two antennas by approximately 25 meters and the physical layout of the roof, the maximum level is expected to be negligibly increased by the proposed operation. Nevertheless, a radiation warning sign will be posted for the benefit of rooftop workers. Note that exposure to the general public will be substantially less. Access to the roof and the penthouse is restricted. Measurements done inside the rooftop penthouse gave results lower than the rooftop by a factor of 1000. On the upper most inhabited floor of First Canada Place, levels were not measurable. Exposure to RF energy by the general public is, therefore, not expected to be a concern.

7.0 MONITORING

Frequency and modulation monitors are indicated in Appendix 1. The modulation monitor provides the following measurements:

a) Total deviation of the main carrier by the main channel.
b) 19 kHz pilot injection level.
c) Carrier frequency and pilot frequency.
d) FM noise, AM noise, and incidental AM.

8.0 LOCATION OF SERVICE AREA CONTOURS

Location of the 3 mV/m (69.5 dBu) and 0.5 mV/m (54 dBu) contours were established using the F(50,50) metric propagation curves, issued for this use by the Department of Communications.

The transmitter power for a maximum ERP of 100 kW was found as follows:

$$\text{Transmitter Power} = \frac{\text{ERP MAX.}}{\text{Antenna maximum power gain x transmission line efficiency}}$$

$$= \frac{100 \text{ kW}}{5.13 \times .931} = 20.9 \text{ kW}$$

TABLE 3

Coverage Contours

Radial No.	Azimuth (Deg.)	Avg. Terrain (m)	HAAT (m)	ERP (kW)	Distance in KM to 3 mV/m	0.5 mV/m
1	0	151.0	240.6	72.4	43.7	77.7
2	45	136.4	255.2	28.2	36.9	69.4
3	90	75.2	316.4	12.6	34.2	66.1
4	135	75.0	316.6	15.9	36.0	68.5
5	180	75.0	316.6	85.1	50.5	85.7
6	225	75.0	316.6	70.8	48.7	83.9
7	270	114.6	277.0	93.3	48.6	83.4
8	315	158.3	233.4	100.0	46.0	80.4
	Average:	107.6	284 m EHAAT			

9.0 FEED SOURCE

CFMX-FM-1 will be fed by means of an off-air link at the transmitter site from the primary station CFMX-FM, Channel 276C_1, in Cobourg.

10.0 EXPIRY DATE

In the event that this Engineering Brief is not submitted to the Department of Communications, Ottawa, for approval within two months of the date on the title page, it should be returned to Imagineering Limited for possible revision prior to submission.

11.0 QUALIFICATIONS OF ENGINEERS

The qualifications of the engineers participating in the preparation of this Brief are on file with the Department of Communications, Ottawa, Ontario.

J. Moltner, P.Eng.

E.A. Bogdanowicz, P.Eng.

APPENDIX 1

EQUIPMENT LIST

ITEM	MANUFACTURER AND MODEL NUMBER
Off-air Receiving Antenna	Kathrein Phased Pair Yagis (103.1 MHz)
RF Band Pass Filter	Sinclair Radio Laboratories Ltd. 41031R
FM Demodulator	MAGNA DYNALAB FT-101P
FM Transmitter	Two Nautel, 11 kW transmitters, combined
RF Transmission Line	Andrew Antenna Company Ltd. HJ8-50B, 7.62 cm (3-inch) air-dielectric Heliax coaxial cable
FM Transmitting Antenna	Kathrein FM CP Panel Type Transmit Antenna 6-bay, directional, circularly polarized
FM Modulation Monitor	Belar Electronics Laboratories Inc. FMM-1
Stereo Monitor	Belar Electronics Laboratories Inc. FMS-1

Transport Canada / Transports Canada

TC File No./Ref No. — TC n° du dossier/N° de réf.

AERONAUTICAL OBSTRUCTION CLEARANCE FORM

FORMULAIRE D'AUTORISATION D'OBSTACLE AÉRIEN

TO BE COMPLETED BY APPLICANT — À REMPLIR PAR LE REQUÉRANT

Owner's / Company's name — Propriétaire ou compagnie
Martin Rosenthal

Applicant's Name — Nom du requérant
Martin Rosenthal

Address — Adresse
468 Queen Street,East, Suite 101

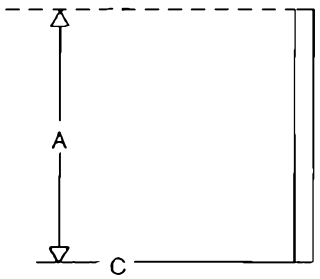
City — Ville	Province	Postal — Code — postal	Telephone No. / N° de téléphone
Toronto	Ontario	M 5 A 1 T 7	(416) 367-5353

Contact — Personne ressource: J. Moltner, Imagineering Limited — Telephone No. / N° de téléphone: (416) 444-1600

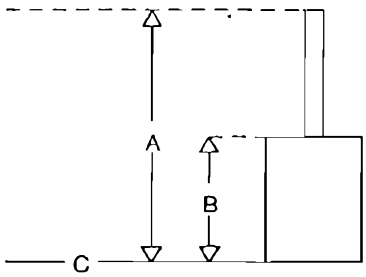
Nearest city / town to proposed facility — Ville la plus proche de la structure proposée: Toronto

Location of Facility — Emplacement de la structure: 43° 38' 56" N Latitude / Latitude N; 79° 22' 55" W Longitude / Longitude O

TOWERS / ANTENNAS — TOURS / ANTENNES



BUILDING OR OTHER STRUCTURE — BÂTIMENT OU AUTRE STRUCTURE



		Feet — Pieds	Meters — Mètres
A	Height above ground — Hauteur au-dessus du sol	1034	315.2
B	Building height — Hauteur du bâtiment	909	277.1
C	Ground elevation above sea level — Hauteur du sol au-dessus du niveau de la mer	278	84.7

List any tall adjacent buildings and structures which may overshadow the proposed structure (Attach sketch) — CN Tower at 850 metres plus collocated existing towers

Faire une liste indiquant les structures et bâtiments avoisinants plus haut que le bâtiment projeté (Inclure un diagramme)

New struc. — Nouv. struc.	Add. to exist. struc. incl. tot. hght. — Ajout à un bâti. exis. incl. haut. tot.	Modulation	Frequency — Fréquence	Power output — Puissance de sortie	Call Sign — Signal d'appel
	X	FM	99.1 MHz	100 KW Max ERP	CFMX-FM-1

TYPE OF STRUCTURE (narrative description and function) — GENRE DE STRUCTURE (description narrative et fonction)

New 125 ft tower to be mounted on rooftop of First Canadian Place in downtown Toronto. Tower will support FM radio broadcast antenna. Existing 160 ft tower on rooftop with overall height of 1069 ft (325.8m) AGL is higher than,and will overshadow,proposed new structure. See attached sketch.

Proposed lighting as per TP-382 — Balisage lumineux proposé en accord avec le TP-382
[X] Yes / Oui [ ] No / Non

Proposed painting as per TP-382 — Balisage peint proposé en accord avec le TP-382
[X] Yes / Oui [ ] No / Non

Proposed Construction — Date — de construction proposée: January 1993

Signature (of applicant) (du requérant) ▶ Date

TRANSPORT CANADA USE ONLY — À L'USAGE DE TRANSPORTS CANADA

REGIONAL MANAGER TECHNICAL SERVICES (as required) — GESTIONNAIRE RÉGIONAL — SERVICES TECHNIQUES (si nécessaire)
Comments — Commentaires

Signature ____ Date ____

AERONAUTICAL ASSESSMENT — ÉVALUATION

Site acceptance — Emplacement acceptable
[ ] Yes / Oui [ ] No / Non (if no reason / si non, pourquoi)

Lighting acceptable as proposed — Balisage lumineux acceptable tel que proposé
[ ] Yes / Oui [ ] No / Non or / ou

Painting acceptable as proposed — Balisage peint acceptable tel que proposé
[ ] Yes / Oui [ ] No / Non or / ou

Temporary lighting required — Nécessité d'un balisage lumineux temporaire
[ ] Yes / Oui [ ] No / Non (if yes type / si oui, de quel genre)

Advise Transport Canada ____ days before erection / Avertir Transports Canada ____ jours avant la construction [ ] and on completion / et à la fin des travaux [ ] Valid to / Valide jusqu'au

Regional Supt. Standards and Procedures: / Surintendant régional — Normes et procédures ▶ Signature ____ Date ____

26-0427 (03-90)

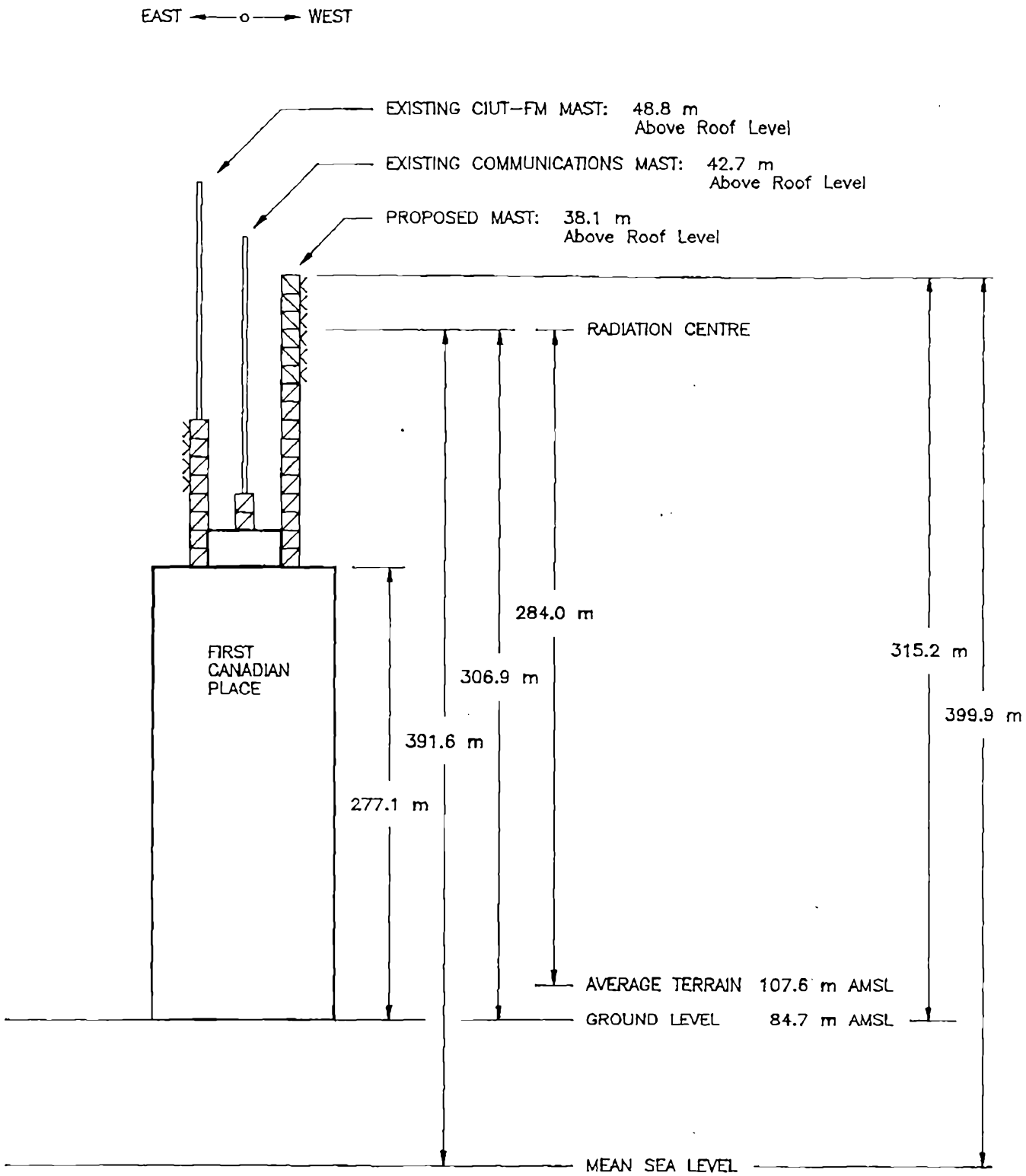


FIGURE 2

ANTENNA ELEVATION DIAGRAM

CFMX-FM-1 TORONTO, ONTARIO
CH. 256C$_1$ 100 kW MAX ERP 284 M EHAAT
60.2 kW AVG ERP
PROJECT: MR-TOR FEBRUARY 1992
IMAGINEERING LIMITED TORONTO, ONTARIO

CFMX–A1

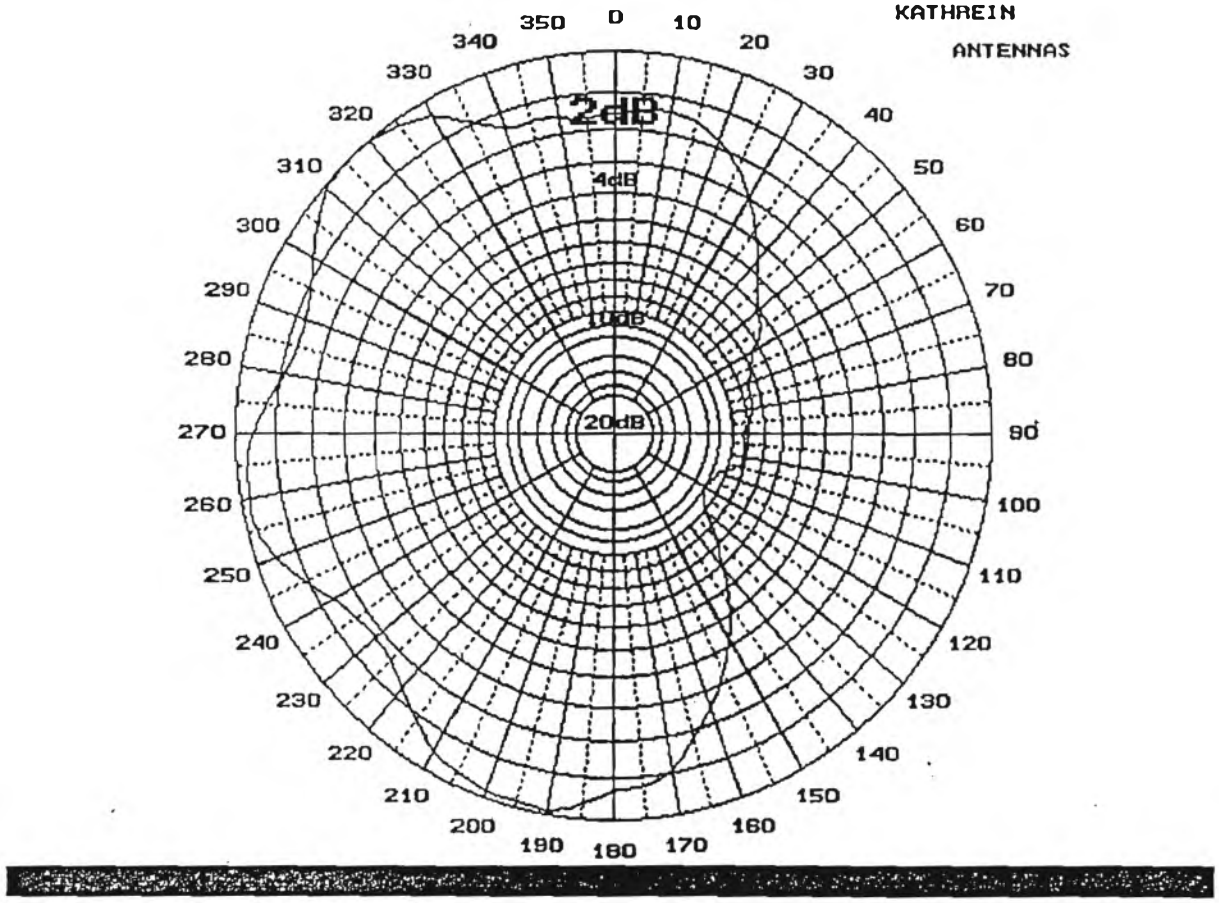


FIGURE 3

ANTENNA HORIZONTAL RADIATION PATTERN

CFMX-FM-1		TORONTO, ONTARIO
CH. 256C$_1$	100 kW MAX ERP 60.2 kW AVG ERP	284 M EHAAT
PROJECT: MR-TOR	REV. 1	13 MARCH 1992
IMAGINEERING LIMITED		TORONTO, ONTARIO

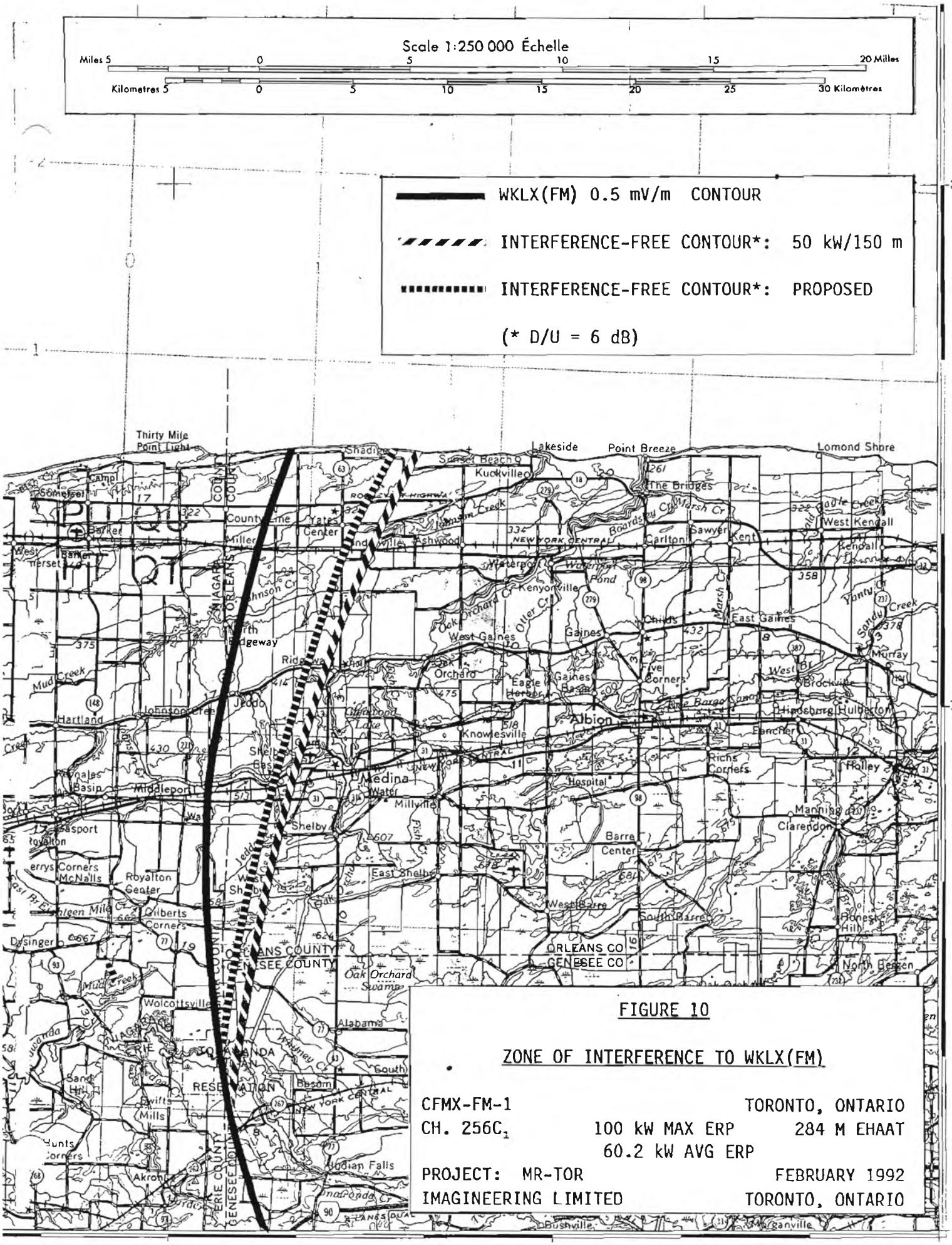


FIGURE 10

ZONE OF INTERFERENCE TO WKLX(FM)

CFMX-FM-1 TORONTO, ONTARIO
CH. 256C$_1$ 100 kW MAX ERP 284 M EHAAT
60.2 kW AVG ERP
PROJECT: MR-TOR FEBRUARY 1992
IMAGINEERING LIMITED TORONTO, ONTARIO

CJBC-4-FM 0.5 mV/m CONTOUR

INTERFERENCE-FREE CONTOUR*: CKO-FM-2 PREVIOUS

INTERFERENCE-FREE CONTOUR*: PROPOSED

(* D/U = 6 dB)

Miles 5 0 5 10 15

Kilometres 5 0 5 10

Scale 1:250,000 Échelle

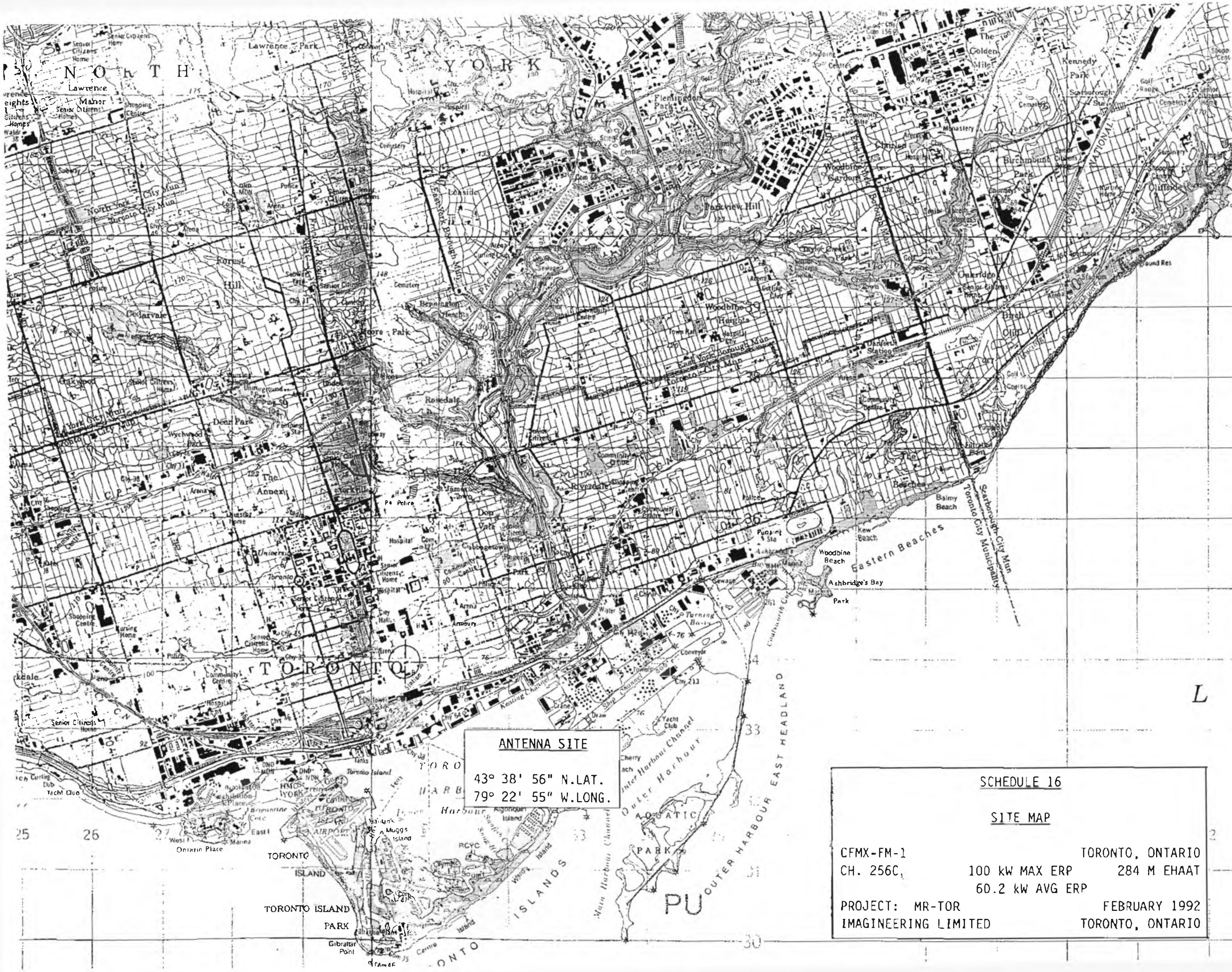
FIGURE 11

ZONE OF INTERFERENCE TO CJBC-4-FM

CFMX-FM-1
CH. 256C$_1$
100 kW MAX ERP
60.2 kW AVG ERP
TORONTO, ONTARIO
284 M EHAAT

PROJECT: MR-TOR
IMAGINEERING LIMITED

FEBRUARY 1992
TORONTO, ONTARIO



ANTENNA SITE

43° 38' 56" N.LAT.
79° 22' 55" W.LONG.

SCHEDULE 16

SITE MAP

CFMX-FM-1		TORONTO, ONTARIO
CH. 256C$_1$	100 kW MAX ERP 60.2 kW AVG ERP	284 M EHAAT
PROJECT: MR-TOR		FEBRUARY 1992
IMAGINEERING LIMITED		TORONTO, ONTARIO

LISTENER LETTERS (T.O.)
This is 1st Section only of brief to CRTC For 99.1 applic.

March 6, 1992

Mr. Allan J. Darling
Secretary-General
Canadian Radio-Television and
Telecommunications Commission
Ottawa, Ontario
K1A 0N2

Dear Mr. Darling,

Enclosed herewith is material which answers questions the CRTC has raised regarding CFMX-FM-1 amendment application #920176500. There are seven complete sets of this information which deals with two general areas:

1) **FINANCIAL**

A) a letter from Martin Rosenthal regarding financial statements and a request for confidentiality;
B) a new letter from the Hong Kong Bank;
C) a copy of the August 31, 1992, financial statements of CFMX-FM;
D) a pro-forma statement of changes in financial position for each of the first 5-years of operation of the new transmitter;
E) financial projections assuming the status quo for CFMX-FM.

The periods covered in the financial projections are for the years ended August 31, 1993, 1994, 1995, 1996 and 1997.

The following inflation rates were used where applicable:

APPLICATION	SUCCESSFUL	STATUS QUO	
1992 - 93	base year	1992 - 92	2.5%
1993 - 94	3%	1993 - 94	3%
1994 - 95	3%	1994 - 95	3%
1995 - 96	4%	1995 - 96	4%
1996 - 97	5%	1996 - 97	5%

The projections assume a successful application and are based on certain business criteria and the above inflation rates. The projections in the status quo are based solely on inflationary changes except where there are fixed long term arrangements.

Revenues in the projections in the status quo are based on the assumption that the market place has been fully exploited by the end of the 1992 year and that forecasted gains would be offset by losses due to future signal deterioration and the only increases will be those caused by inflation.

... 2

468 Queen Street East, Suite 101, Toronto, Ontario M5A 1T7 Tel: (416) 367-5353, Fax: (416) 367-1742

2) TECHNICAL

Further to Mr. Paul DeBlois' letter of February 24 seeking additional details concerning CFMX-FM-1's reception problems within the central Toronto area, we are pleased to provide the following information in response to the Commission's queries.

Since the main thrust of the supplementary material is of a technical nature, we have asked our engineering consultants, Imagineering Limited, to prepare the bulk of our response to the Commission's letter. As such, Section 2.0 of this document describes the nature of the reception problems being experienced by CFMX-FM-1 and its listeners and would-be listeners. Section 3.0 quantifies the areas and populations affected insofar as it is possible to do so. Finally, Section 4.0 outlines the reasons why the use of Channel 256 in Toronto represents the only solution to CFMX-FM-1's problems.

However, before presenting the technical data prepared by Imagineering, I would like, by way of preamble, to briefly draw the Commission's attention to a number of salient points with respect to the application submitted by Mr. Martin Rosenthal.

To begin with, as was stated in our supplementary brief (Schedule 27), if 96.3 were doing the job for CFMX's classical music format, we would not be applying for 99.1. In this regard, Mr. Rosenthal has expended, over the past several years, every effort and millions of dollars to provide CFMX with the audience and advertising base that it requires from the Toronto market.

While the Commission's letter of February 24 specifically addresses the reception problems within central Toronto, it is important to stress that CFMX's needs are by no means limited to this area. Indeed, while central Toronto is critical to both our listenership and advertising requirements, if CFMX is to survive and go on to fulfil its true potential, the level of improvement that 99.1 will provide to our overall coverage area is also absolutely essential since our reception problems are not unique to central Toronto. The cumulative effect of finally having a consistent signal throughout its entire coverage area will impact significantly on CFMX's ability to build audience and advertising support.

It is also important to point out that CFMX's reception problems in central Toronto, and other heavily built-up areas within the greater metropolitan region, are exacerbated, to a considerable degree, by the fact that classical music is more technically demanding than virtually any other musical format. As we note in Schedule 27, classical music, with its great dynamic range, requires a high-quality signal, whereas other musical formats, which are greatly compressed, are far less technically demanding. Therefore, while 96.3 has not been able to provide CFMX with the true quality of signal that its classical music format requires, it remains a very usable Toronto frequency for other programming formats.

The ongoing technical concerns that CFMX has been struggling with in the Toronto market over the past four years in turn have given rise to other problems that impact significantly on the station's artistic and cultural mandates.

CFMX, under Mr. Rosenthal's ownership has, from day one, endeavoured to offer its listening audience the fullest possible range of musical programming form the gentleness of the classical soloist to the fullness of the symphony. The station is also committed to showcasing Canadian classical music talent.

... 3

Because of 96.3's inability to provide CFMX with a quality of signal that is compatible with the technical demands of its classical music format, as discussed earlier, the station has fallen short of both these self-imposed objectives. However, with access to 99.1 and its superior level and quality of signal, CFMX will be able to deliver the full spectrum of classical music and feature more Canadian classic artists, many of whom are initially recorded as soloists or as members of smaller ensembles.

A further inhibiting by-product of CFMX's technical problems is the station's inability to fully serve and support the many key cultural organizations and performing arts groups who are badly in need of a dedicated vehicle to reach their respective audiences. As Canada's only full-time classical/fine arts radio station, CFMX has a special role and responsibility to provide the necessary leadership and support in this regard.

It naturally follows that 99.1's enhanced signal quality will add greatly to the listening pleasure of CFMX's existing audience, reach thousands of new listeners, unable at present to receive our classical music programming, and permit the station to fully meet its special responsibilities to Canada's classical music industry and its attendant cultural organizations and performing arts groups.

In addition, 99.1 will enable CFMX to fully serve the market area within Southern Ontario that was originally anticipated by Mr. Rosenthal and the Commission, when approval was first granted for 96.3. By extending its unique classical/fine arts format to the furthermost reaches of 99.1's coverage contours, CFMX will introduce a programming diversity that no other station or format can provide because we are "one of a kind" in Canada.

Having briefly reviewed some of the key technical considerations and their related implications to CFMX and it's ability to perform to its full potential, we now turn our attention to the data compiled by Imagineering in response to the Commission's queries in your letter of February 24.

1.0 INTRODUCTION

Subsequent to the filing by Martin Rosenthal for a Change of Facilities of CFMX-FM-1, CRTC Application No. 920176500, the Commission has requested additional information concerning Schedule 27 of the Application dealing with reception problems in central Toronto. This document addresses the three questions raised. Section 2.0 describes the nature of the reception problems, that is, the mechanisms which degrade reception of CFMX-FM-1. Section 3.0 quantifies the areas and populations affected insofar as it is possible and Section 4.0 outlines the reasons why it is believed that use of Channel 256 in Toronto represents a good solution to these problems.

2.0. NATURE OF THE PROBLEMS

2.1 Intermodulation and Cross-Modulation Interference

These two interference mechanisms are both caused by the effects produced by strong signals in the front-end of a receiver. Cross-modulation has the effect of driving the receiver into its non-linear range in such a manner that the modulation of the undesired signal is heard along with the desired signal and, in extreme cases, overpowers the desired signal. It is produced by a combination of all the very strong signals in the downtown area. Intermodulation is the generation of new frequencies, or products, by the mixing of two or more strong signals by, once again, driving the front-end of the receiver into its non-linear range. Interference arises when the generated product falls on or near the desired signal and is sufficiently strong to cause interference to the desired signal. The intermodulation product that causes the most interference to CFMX-FM-1 is produced by CHFI-FM and CKFM-FM as follows:

2 x 98.1 MHz (CHFI-FM) - 99.9 MHz (CKFM-FM) = 96.3 MHz (CFMX-FM-1)

Both these effects are very much a function of the receiver design and both effects become more pronounced with an increase in the signal levels of the interfering signals and with increasing difference between the levels of the interfering signals and the desired signal.

In the case of CFMX-FM-1 reception in the central Toronto area, both effects can render reception of CFMX-FM-1 impossible on certain types of receivers.

Cross modulation occurs in most cases within about 1 or 2 km of the CN Tower; however, since intermodulation interference is so severe in this area, it is difficult to distinguish one from the other. Intermodulation interference is the more serious problem since it can affect some types of receivers over a considerably larger area as demonstrated in Section 3.0.

It is unfortunate that sensitivity of a receiver, that is, its ability to pick up a weak signal, and its resistance to cross-modulation and intermodulation interference, are opposing criteria in receiver design and it would seem that inexpensive portable radios and, indeed, some expensive hi-fi receivers (tuner and amplifier combinations), fall into a category in which immunity to intermodulation interference was sacrificed to achieve other goals. Automobile receivers are generally designed to operate in an environment where they have been driven from one city to another, with an accompanying, dramatic shift in the signal strength of the desired signal, and are designed to provide adequate performance even in the face of very strong local signals.

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They are thus designed with improved front-end linearity, AGC action, and better front-end selectivity in order to reduce the effects of cross modulation and intermodulation; as a rule, car radios generally perform better than do portable radios and some hi-fi tuners and receivers, but they too have their limits.

2.2 Shadowing Caused by Large Buildings and Other Structures

This signal degradation mechanism affects most FM stations throughout their coverage areas but it affects CFMX-FM-1 particularly badly in the central Toronto area due to the combination of shadowing, multipath propagation and the distance of the station from the Metro Toronto area.

The signal level of CFMX-FM-1 in the direction of Toronto is shown in Figure 1 which shows the average value and the signal variation experienced at each point. There is a signal dip of about 5 dB below what would be expected in the area from the downtown core to the Don Valley. This dip, while significant, is not of itself sufficient to prevent reception of CFMX-FM-1. However, because the vast majority of receiving locations in the central Toronto area are blocked from the direct signal by various man-made structures, including large office towers and apartment buildings, the CFMX-FM-1 signal is subject to wide level swings over a fairly short distance.

Typical swings over a distance of several wavelengths at any particular location are 10 to 15 dB with occasionally deeper fades. Part of this variation is due to multipath but a significant portion of signal variation is due to the signal being blocked, or not.

This environment affects all stations, however, the CN Tower located signals and, indeed, those located on the First Canadian Place rooftop, tend to experience less shadowing loss in the central Toronto area because of their high incident angle into the canyons formed by the various tall buildings, whereas the CFMX-FM-1 signal enters the Toronto area at a very shallow angle and, consequently, experiences greater fades in shadowed areas than do the local signals.

2.3 Multipath

All FM radio signals undergo reflection from elevated terrain features and various man-made structures. The reflected signals sum with the direct signal and other reflected signals to produce large variations in the signal level at any particular point in space. All the signals in the Toronto area, as elsewhere, are subject to this phenomenon but CFMX-FM-1 experiences a greater prevalence of annoying multipath artifacts.

... 6

In combination with the fact that the signal is much weaker in Toronto than the local stations due to its distance and additional shadowing loss caused by the large number of high-rise buildings, the signal often fades below the receiver threshold. Additionally, at a location where the signal is faded either due to simple shadowing or due to a multipath fade, or both, there is the potential for intermodulation interference to manifest itself since, as was mentioned previously, the potential for intermodulation interference is increased if the desired signal becomes weaker relative to the signals producing the interference.

3.0. AREAS AND POPULATION AFFECTED

It is virtually impossible to quantify, precisely, the areas where these interference and signal degradation mechanisms cause the CFMX-FM-1 signal to become inadequate. The reason for this is that the audible artifacts produced by these effects are very much a function of receiver design, as mentioned above. However, we have endeavoured to quantify this to the extent possible as described in the following section.

3.1 Letters of Complaint

Letters documenting reception difficulties have been received by CFMX-FM-1 ever since the station started operation in Mississauga. These letters have been kept on file and we use them here to substantiate the point that the signal quality is not satisfactory for a classical music station.

Once the station realized the extent of the signal problems, it began to keep a record of letters received specifically dealing with this issue. There were 72 of these letters received prior to the power increase of 96.3. In addition, a very high percentage of the thousands of letters received at the station make some reference to signal problems.

For instance, the station has mailed out over 500 antennas and antenna literature (about more sophisticated antennas) to help listeners receive an adequate signal.

The 42 letters which were analyzed were received after the power increase of 96.3 MHz and are included herewith for the Commission's perusal. Letters received prior to this date are available if the Commission desires to see them. It can be seen that some of these complaints originate from areas well removed from Toronto or which were not specific about their location. There is a higher concentration of such complaints throughout the Metro Toronto area.

Where the writer of the letter has indicated the location of the specific area of inadequate service, or the location of his residence, we have indicated this area with a red dot on a map of Metro Toronto, contained in Figure 2.

... 7

The numbers written on the dots correspond to numbers inscribed on the letters for reference. It can be seen that, while there is some concentration of complaints in the central part of Toronto, possibly due to the higher concentration of population in this area, the complaints are sprinkled throughout the City, indicating that it is not just a localized area which is affected.

The letters do not represent the entire story. As a rule, a very small percentage of listeners will actually take the trouble to write a letter. More frequently, people express their displeasure by telephone and they do so on a regular basis. We receive at least one such phone call every day.

Thus, if listener complaints can be taken as an indicator, then the entire Metro Toronto area could be considered affected by reception problems of one sort or another for CFMX-FM-1.

3.2 Multipath Problems

It has been indicated previously that multipath affects CFMX-FM-1 virtually throughout its service area, but is particularly annoying in the Metro Toronto area. This problem affects both mobile as well as stationary receivers. In the case of mobile receivers, the effect is the annoying picket-fencing which occurs as the receiver's antenna travels through alternating high signal and low signal areas. Normally this would result in a burst of broadband noise which may be heard in the audio as the desired signal drops below the receiver threshold. However, the presence of other strong stations producing intermodulation and cross-modulation effects, which might not be detrimental in a situation where there is an adequate desired signal level, may also produce a short duration rasp in addition to the normal artifacts produced by fading.

Statistics show that approximately one-third of CFMX's audience listens while in their automobile. Thus, serious impairment along any major route in the city would expose great numbers of people to an unacceptable signal for at least a portion of their listening time.

It happens that very busy routes, such as the Don Valley Parkway, portions of the Gardiner Expressway roughly between Hwy. 427 and Jameson, and the 401 for several kilometres east of Dixie Road, experience particularly annoying picket-fencing. This generally discourages people from listening to the station while commuting along these routes since, for a significant portion of their drive-time, the station is sufficiently impaired to become an annoyance, encouraging people to tune to alternate sources of programming.

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In stationary situations such as the home, a multipath fade may require the listener to critically adjust a receiver mounted antenna or relocate the receiver altogether to a location where the signal is stronger. If the signal at the better location is still near threshold, one may experience annoying fades and distortion as people move about the room.

The problems of multipath fading affect all stations everywhere to some degree, but the severity of the problem throughout the Metro Toronto area is annoying to CFMX-FM-1. Some areas mentioned above are particularly troublesome but this applies, generally, to those areas which are geographically low and are overshadowed with large buildings or large AC power transmission line towers, etc., which cause strong reflected signals into the shadowed areas. It is very difficult to depict these areas individually on a map. Suffice it to say, however, that such scenarios occur frequently throughout Metro Toronto and affect hundreds of thousands of potential listeners.

3.3 Radio Reception Tests and Field Strength Measurements

It has been stated above that because the manifestations of interference are very much a function of the type and quality of a receiver, it is virtually impossible to establish a contour in which reception is impaired and beyond which reception is acceptable. In order to give the Commission a sense of the nature of this problem, we have conducted a number of radio reception tests throughout the central Toronto area using five different types of receivers representing typical devices that would be used. We did not include fixed hi-fi tuners or receivers which do not readily lend themselves to this type of survey. A number of locations were selected throughout the central Toronto area and at each location the field strength of CFMX-FM-1, as well as representative Toronto FM stations, were noted. The values of field strength, as well as quality of reception, are given in Table 1.

The reception tests were carried out in various parts of the city and the locations are shown on the map in Figure 3. One series of tests was carried out generally east of the CN Tower, starting from a location very near the CN Tower itself out to a distance of approximately 10 km. Other points were measured at various distances and azimuths from the CN Tower.

The intent of these tests was to broadly identify areas of the city where usable reception could be obtained easily and where usable reception was virtually impossible on most receivers. The areas in between, of course, would involve some sort of transition, depending on the particular mix of radio receiver types and their quality. The tests give the Commission a good sense of the areas involved and, hence, the people affected.

The reception quality is given in descriptive form and coded from 1 to 5 as follows:

Grade	Description
1	Impossible to receive intelligible sound. Completely overridden by intermodulation interference.
2	Some reception possible by critical adjustment of antenna and receiver orientation but not usable for classical music format. Local movement of people and objects causes interference.
3	Reception possible with careful adjustment of antenna and receiver orientation and results in reception with some impairment but acceptable. The impairment becomes annoying with extended listening.
4	Requires adjustment of antenna and radio but the resultant quality is acceptable.
5	Excellent reception.

Table 1 gives the level of interference received and the ability to obtain a usable signal by adjusting the receiver's antenna and orientation; it was not possible to establish precise criteria for acceptability or non-acceptability since the tests could not be carried out in a carefully controlled environment and since a "standard" receiver does not exist.

The field strength measurements were made with a dipole antenna and a tunable voltmeter and give the received signal (voltage) in dBmV. Table 1 gives the actual values obtained. The principal reason for making the signal measurements was to determine the difference between the desired and undesired signals and to determine the point at which CFMX-FM-1 can be received.

A rough conversion of received signal in dBmV at a height of about 2.5 m to dBuV/m at 10 m is possible by adding a factor of 80 to the signal level figures in Table 1.

It should be noted that all reception tests made during the survey were outdoors at street level.

Since most reception is indoors it should be recognized that a certain amount of building penetration loss would be experienced and would reduce intermodulation interference and improve the quality of reception, provided that this loss did not at the same time fade CFMX-FM-1 to below an acceptable signal level. Building penetration loss varies widely from perhaps 6 to 10 dB for a brick or wood frame house to 15-20 dB for a highrise apartment building. We can conclude that indoor reception will be better than depicted in Table 2 but our test did not include indoor surveys.

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It was found that the principal reason for the inability to receive CFMX-FM-1 in the central Toronto areas was intermodulation interference caused by CHFI-FM and CKFM-FM. These tests did not evaluate the multipath problem since they were done while stationary and the receivers were adjusted to optimize reception of CFMX-FM-1. Multipath interference, as pointed out earlier, occurs throughout the Metro Toronto area.

When CFMX-FM-1 first began operation in Mississauga its effective radiated power was 19 kW; upon implementation of the power increase, the radiation toward Toronto was increased to 100 kW, an increase of 7 dB. The CFMX-FM-1 signal readings obtained in this survey vary between +10.5 dBmV and -15 dBmV. The CFMX-FM-1 signal that would have existed at these locations before the power increase would have been +3.5 dBmV to -22 dBmV. Since the local stations exceed the CFMX-FM-1 signal by roughly 20 to 40 dB, previous to the power increase, CFMX-FM-1 would have been exceeded by the local station by 27 to 47 dB.

To put these numbers into some perspective, it is necessary to bear in mind that they are logarithmic. Thus, for example, if we were receiving a signal from two stations identical in every way except radiated power, obtaining a signal 30 dB, for example, stronger from one than the other would require the one to transmit one thousand times the power of the other. CFMX-FM-1, in the central Toronto area must compete with stations which, if all else were equal, would be transmitting one hundred times (20 dB) to ten thousand times (40 dB) the power of CFMX-FM-1.

The survey results show that acceptable reception of CFMX-FM-1 begins when the ratio between CFMX-FM-1 and other intermodulation interference producing stations, as represented by CHFI-FM, diminishes to about 10-15 dB greater than CFMX-FM-1, with and interfering signal level of about 20 dBmV. It is clear that if the present ratio of 20 to 40 dB, existing within about 10 km radius of the CN Tower, is beyond the tolerance limits of most radios, then certainly the ratio which previously existed when CFMX-FM-1 operated at 19 kW, i.e., 27 dB to 47 dB, would be that much worse.

The power increase made a significant improvement in signal level in central Toronto but that improvement was still simply not enough to overcome the intermodulation interference caused principally by CHFI-FM and CKFM-FM in the central Toronto area.

A very important point to note is that in attempting to receive CFMX-FM-1 in the central Toronto area where other ambient signals exceeded the desired signal by typically 20 to 40 dB, it was necessary to make the receiving antenna as small as possible.

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It can be seen from Table 1 that, at distances of approximately 4 to 5 km, reception on the portable radios with monopole antennas was possible if the monopoles were completely collapsed and the radios then oriented to minimize the local stations and to maximize the signal from CFMX-FM-1. At the 4 to 5 km distance, it was still impossible to receive the CFMX-FM-1 signal adequately on the Walkman-type units since the antenna could not be collapsed; these types of radio generally employ the headset connecting cable as the antenna. This result very clearly indicates that a non-technically oriented listener experiencing difficulty in receiving CFMX-FM-1 in the central Toronto area would only compound his difficulty if he extended a built-in antenna on a receiver, or attached a more effective external antenna. With the antenna extended or enhanced, the unwanted stations would produce more intermodulation interference.

An equally important point to note is that none of the radios used in the test experienced any difficulty in receiving any of the local Class B and C Toronto FM stations, notwithstanding that all of them have intermodulation products which fall on them.

While these reception tests are not a rigorous determination of where reception is possible and where it is not, for reasons mentioned above, we believe that some general conclusions can be made with regard to areas impaired by intermodulation interference as shown in Table 2. It should be noted that other types of reception problems, such as multipath, affect larger areas of the CFMX-FM-1 coverage area.

3.4 Effects of a Level Playing Field

A good example of the stranglehold that reception difficulties impose on CFMX-FM-1's audience and revenue development is to compare CFMX-FM-1 against another station both in the Toronto market and where both stations would enjoy a level playing field. We therefore examined the reach and average quarter hour audience of CFMX-FM-1 and CBL-FM using the Fall 1991 BBM* survey.

*BBM Bureau of Measurement
Fall 1991 Survey

CFMX-FM-1 and CBL-FM, while differing in mandate, format and presentation have certain similarities. CBL-FM plays blocks of concert music. Both stations have similar demographics, with a high incidence of university educated and owner/manager/professional listeners. CBL-FM with its block format and varied programming responsibilities should be lower in both cume and hours tuned than a station providing consistent programming. Indeed, in the areas where the signals of both CFMX-FM-1 and CBL-FM are unimpeded, this is virtually always the case.

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It is not, however, in Metro Toronto. The following "snap-shot" is provided to illustrate this point.

If we take the areas of Oakville, Burlington and Peel, or BBM cells 5271, 5279 and 5220, respectively (see Figure 4), both CBL-FM and CFMX-FM-1 enjoy a level playing field. Both stations enjoy clear signals in these areas, with the following results. If we combine these areas, CFMX-FM-1 has, as of the Fall 1991 ratings sweep, an average quarter hour audience of 2,400, with a weekly reach of 40,800, representing 4.8% of that area's population. CBL-FM, in the same areas, has an average quarter hour audience of 1,400, with a weekly reach of 36,500, representing 4.3% of that area's population. Now, if we examine the figures for cell 5210, or Metro Toronto, the situation is reversed due to the signal problems. In 5210, CFMX-FM-1 has an average quarter hour audience of 8,800 and reaches 167,900 people weekly, or 8.4% of the area's population. CBL-FM, on the other hand, with an unimpeded signal, boasts an average quarter hour audience of 11,600, with a reach of 208,300 representing 10.4% of the population.

We can therefore assume that with a clear signal in the Toronto area, CFMX-FM-1 would exceed CBL-FM's ratings, giving it access to a larger audience that would make it much more attractive to advertisers.

In order to justify the figures quoted on page 1 of this Response, we trended CFMX-FM-1 and CBL-FM back one year, using the Spring 1991 ratings sweep and the Fall 1990 Sweep. While the sample sizes were smaller, with less than half of the ballots that comprised the Fall 1991 book for the areas outside of Toronto, the picture remains the same. In the unimpaired cells of 5220, 5271 and 5279, CFMX-FM-1 shows an average quarter hour audience of 1,300 in the Spring 1991 book, with a reach of 26,900, representing 4.7% of the population. In the Fall of 1990, CFMX-FM-1 shows an average quarter hour audience of 2,700, with a reach of 30,200, representing 5.2% of the population. CBL-FM, on the other hand, shows an average quarter hour audience of 800 in the Spring 1991 book, with 19,400 weekly listeners representing 3.4% of the population, and in the Fall 1990 book, an average quarter hour audience of 300, with a reach of 9,100, representing 1.6% of the population (see Table 3).

In the impaired cell of 5210, or Metro Toronto, once again the situation is reversed. In the spring of 1991, CFMX-FM-1 shows an average quarter hour audience of 8,800, with a weekly reach of 159,000 or 8.1% of the population, with CBL-FM delivering an average quarter hour audience of 10,300 and a weekly reach of 220,200 or 11.2%.

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In the fall of 1990, CFMX-FM-1 shows an average quarter hour audience of 10,100, with a reach of 131,200 or 6.7% of the population. For that book, CBL-FM shows an average quarter hour audience of 12,900, with a reach of 226,200, representing 11.5% of the population.

To put this in more human terms, many advertisers (see Appendix 'A') and would be advertisers (see Appendix 'B'), are located in the downtown core and other of Toronto's built up areas. Virtually all of the present advertisers who are located in central Toronto cannot receive the station. To quote some examples, the Toronto Symphony offices in Roy Thomson Hall cannot receive CFMX-FM-1 at all; neither can the National Ballet of Canada offices, located on King Street East, or the Canadian Opera Company, the Canadian Stage Company or Theatre Plus Toronto, all located on Front Street east between Yonge and Parliament Streets. These are all prequalified clients who understand where their audience and potential audience is, but even having said that, it is still frustrating for them to not be able to receive the station that is a cornerstone of their marketing.

Now, if we take this a step further, to the businesses in the core and built up areas, we begin to seen an even larger problem. On many occasions, CFMX-FM-1's account executives have called on businesses in the core that would benefit from access to the CFMX-FM-1 audience. It is difficult, if not impossible, to market CFMX-FM-1 to the decision maker at a given business, when the office radio is turned on and nothing is received except noise. Meanwhile, he or she is able to receive clearly all of the other stations in the market. Furthermore, the perception is that if he or she cannot receive the station, neither can potential customers, many of whom work in the city core and built up areas.

Clearly, the continued reception difficulties being experienced by CFMX-FM-1 have impeded both audience growth and revenue. Approval of the application by Martin Rosenthal to use Channel 256 in Toronto will allow CFMX-FM-1 to achieve its full potential, not only in the Metro Toronto area, but also to provide a new service in many communities which do not now have access to a full time classical music station.

4.0 SOLUTION TO THE PROBLEMS

We have demonstrated above that in order to achieve the desired level of technical quality of reception of the CFMX-FM-1 signal, it is necessary to reduce the level of multipath in the Metro Toronto area but, more importantly, to provide a signal which is strong enough to compete with the other signals available in the Metro Toronto area from the CN Tower.

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The approval of the application by Martin Rosenthal to use Channel 256 sited in Toronto will have the effect of levelling the playing field between CFMX-FM-1 and the several other Toronto stations insofar as signal level and receivability is concerned. The result of the implementation of Channel 256 on First Canadian Place will have the following results:

a) Equalizing Signal Levels

Since Channel 256 is a Class C allotment, the signals radiated by this station will provide a field strength in the central Toronto area which is equivalent to that provided by other Toronto stations. It is a well known fact that receiving antenna installations are only adequate to provide the minimum acceptable level of signal to their receiving apparatus. This phenomenon was formally identified many years ago in the TASO Report dealing with television reception and it stated that receiving antenna installations increased in quality as a function of distance from the transmitter location, a seemingly trivial conclusion but a very important one in may ways. Thus, people located near the transmitters would almost universally have set-mounted, monopole and dipole antennas while those located farther from the station would have outdoor antennas and, in the extreme, mast-mounted antennas with rotors.

People located in an area such as the central Toronto area would not be expected to have sophisticated receiving equipment since all of the Toronto stations have strong signals which can be received on virtually any kind of receiver and antenna. A station whose signal is 20 to 40 dB below the ambient, so to speak, would be at a great disadvantage even in the absence of other factors such as intermodulation interference and multipath. Use of Channel 256 in Toronto will avoid this problem and make it just as easy to receive CFMX-FM-1 as any other Toronto station.

b) Minimized Shadowing

Since the proposed site is very high and located in the downtown core, it will minimize the shadowing experienced behind buildings and in valleys by virtue of the steep entry angle into the shadowed areas, particularly in the downtown area which is replete with high-rise office towers and apartment buildings. Use of Channel 256 from a high location in downtown Toronto will minimize shadowing insofar as possible.

c) Reduced Multipath

Since the high elevation proposed will optimize the direct signal and minimize shadowing, it should statistically reduce the incidence of artifacts induced by multipath. These artifacts will be reduced further by virtue of the fact that the signal, particularly in the central Toronto area, will be roughly 30 dB stronger than it is currently; thus the fade margin to receiver threshold will be much larger than it is now. The use of Channel 256 in Toronto will dramatically reduce the incidence of annoying artifacts produced by multipath propagation in the Metro Toronto area.

d) Freedom from Intermodulation Interference

It has been pointed out earlier that intermodulation interference is worsened where the desired signal is weak in comparison to other signals.

In the present case, CFMX-FM-1 is subject to intermodulation interference out to about 10 km from the CN Tower. If the use of Channel 256 is authorized by the Commission, interference to the reception of 99.1 MHz should be extremely infrequent since it will be generally the same magnitude as the signals producing the intermodulation interference. This is evidenced by the fact that all frequencies in the Toronto area are subject to some combination of third order intermodulation products which could potentially cause interference; however, we are not aware of any particular problems with intermodulation interference to any of the Toronto stations. Authorization to use Channel 256 will eliminate intermodulation interference as an issue to the reception of CFMX-FM-1.

As can be seen from the foregoing information and comment, and indeed as illustrated throughout our entire application, 99.1 truly represents the only solution to CFMX-FM-1's technical difficulties and the many related issues involved.

From our perspective, 99.1 will repair CFMX-FM-1's signal and reception problems within central Toronto and in other trouble spots throughout its present coverage area. It will provide our unique and technically-demanding classical/fine arts format with the quality of signal that it requires to program fully and satisfy the listening needs of CFMX-FM-1's present and future listeners. Access to 99.1 will also enable CFMX-FM-1 to extend its programming diversity to all areas of its coverage contours and, the in process, allow the station to greatly enhance its audience and revenue bases, and subsequently its ability to fulfil both its potential as a commercial entity and its responsibilities to Canada's classical music artists, cultural organizations within Southern Ontario and the Canadian broadcasting system.

In conclusion, we trust the foregoing material adequately responds to the Commission's queries, as outlined in your recent letter.

If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

Jerry Good
General Manager

JG/yml
encl/

Mr. Allan Darling
Secretary General
Canadian Radio-television and
Telecommunications Commission
Ottawa, Ontario
K1A 0N2

April 27, 1992

Dear Mr. Darling:

RE: CRTC Applications: 920176500, Martin Rosenthal for CFMX-FM Cobourg;
912006400, Rawlco Communications Ltd. for new Toronto FM; and
920179900, Redmond Broadcasting Inc. for CJEZ-FM Toronto

This intervention is on behalf of Telemedia Communications Ontario Inc. (TCOI or Telemedia), the licensee of 15 Ontario radio stations, including CJCL-AM in Toronto, CFOR-AM in Orillia, and CKMP-AM in Midland, Ontario.

This intervention strongly opposes the granting of Toronto FM frequency 99.1 to any of the three applicants.

Copies of this intervention have been sent directly to each of the applications by fax and courier, and confirmation is attached.

Telemedia has four significant reasons for opposing these applications. In summary, they are:

1. During the short term transitional period there is no compelling reason for the Commission to release this last Toronto "C-1" channel. The Commission should look long-term for the best possible use of this scarce public resource. It is fairer to everyone in the long-term for the Commission to allow an open call for this frequency.

2. In the short-term, the three applicants should be held to their commitments, since they were well aware of the limitations of which they now complain.

3. The call by the Commission to allow only existing Toronto FM licensees to apply is unfair to CJCL-AM which should have been allowed to apply.

4. There are significant flaws in the applications of all three companies, and insufficient evidence or benefits presented by them for the Commission to grant this frequency.

ch of these points is discussed in turn below:

1. Short-term Concerns Should not Govern CRTC Disposition

The first point we wish to make is that this is too valuable and important a frequency to be determined on the basis of short-term considerations.

We emphasize "short-term" because the only reason the CRTC has limited the call to existing FM licensees is that it does not consider that the Toronto market can sustain an additional radio station at this time.

That is by definition a transitional problem which will evaporate within a year or two of the launch of the Rawlco station, when the southern Ontario economy will also have recovered.

However, by taking this approach, the Commission has in effect limited itself in deciding who should be awarded this scarce public resource.

There are many possible applicants for the CKO frequency besides the three applicants in this proceeding. Many of them appeared in competition to the Rawlco application awarded in 1990. Many also responded to the request for comments on the use of the CKO frequencies on a local or national basis.

As Toronto further matures, additional applicants will undoubtedly emerge.

Surely the best long-term use of the CKO frequency can only be determined by having an open call for the frequency, to ensure that all possible uses for 99.1 Mhz can be canvassed.

However, the CRTC has deprived itself and the Canadian broadcasting system of this opportunity by taking a short-term view.

We are aware that there may be some that would argue that if the frequency is not awarded soon, it will somehow be taken away by a possible U.S. broadcaster applying for an incompatible FM frequency on a first-come, first-served principle.

Telemedia has researched this point and has satisfied itself that the current Canada/U.S. FM arrangements effectively reserve 99.1 indefinitely as a C-1 channel earmarked for the Toronto market. A change in this allocation can only take place with DOC approval.

Thus, there is no spectrum-related reason for the Commission to move on a precipitous basis and award the CKO frequency simply because it is available.

Toronto is Canada's largest market. It is a dynamic, fast-growing market, with a unique cosmopolitan and multi-racial blend of old and new, rich and poor.

In these circumstances, it is all the more important to ensure that new ideas and sources of capital are not forestalled from applying for the last C-1 frequency.

We believe it is a fundamental principle that the Commission should not feel constrained to rush in and award this license in a process that is stunted and restricted purely because of short-term considerations.

Where a scarce public resource is involved, and in a market the size of Toronto, a long-term view is essential to ensure that the best use for this frequency is selected.

2. Applicants Should be Held to Commitments

Our second point is that the three applicants in this proceeding should not be heard to complain about the limitations of their present technical operations. After all, they applied for these parameters and were awarded what they asked for.

All of their plans were made in the contemplation that they would be working within their present technical parameters.

In these circumstances, Telemedia considers that there is no compelling reason why the CRTC should narrow its selection to these applicants and give them the only opportunity to present plans for the use of the 99.1 frequency.

3. Process is Unfair to AM Licensees like CJCL

If, despite the points noted above, the Commission is determined that it wished to grant the CKO frequency to an existing FM licensee only, it has, in CJCL's view, been quite unfair in how it has gone about this process.

We take it as a given that the reason propelling this limitation is the short-term concern not to add a new signal to the Toronto market at this time.

However, if that is the concern, the Commission to be fair should have allowed existing AM licensees to apply for the frequency as well. CJCL Radio is the only stand-alone AM left in Toronto. The station is attempting to provide a unique programming service in the market despite serious signal difficulties and severe technical limitations on the 1430 AM channel. Given the increasing technical reception problems encountered by AM radio stations in major urban markets, there are compelling reasons why these stations should also be considered in any such call for applications.

However, the Commission explicitly limited this call to existing FM licenses.

In our view, this was unfair and discriminatory. The move of an AM station to an FM frequency has been approved by the Commission in a number of markets in the past because of technical considerations and it is clear that such a move would also hold the number of stations constant, thus allowing a newly licensed station like Rawlco to get launched.

We further point out that in CRTC Public Notice 1992-29, in a virtually identical situation with a call for 97.5 in London, the Commission "...calls for applications from other holders of licenses for AM and FM stations...".

4. Applications are Deficient on their Merits

As the Commission has noted in its Public Notice 1991-126, it has not made a determination on the most appropriate use of this frequency.

Telemedia has reviewed the Public Access files for each of the three applicants, and respectfully suggests that none of them have made sufficiently compelling arguments to justify the Commission awarding this last "C-1" FM channel for Toronto.

In particular, Telemedia wishes to comment on each application:

A. CJEZ-FM

CJEZ-FM was licensed in 1986 and went on the air in May 1987. This application suggests about 500,000 people would be added to the station coverage area, and that the rationale for the application is because of audience complaints about the inferior signal, especially from highrise apartments.

There is little specific evidence or documentation presented in the Redmond application to support this case. The station has a unique music format in Toronto and its programming is primarily geared to Toronto residents.

The research done by Yerxa attempting to profile the new population to be covered with CJEZ's current audience is thin evidence upon which the Commission should make such an important decision. There has been no overwhelming public evidence presented suggesting the population of the new area is demanding such additional service. In fact, the easy-listening audience in the proposed additional coverage area is well-served by such stations as CKLH-FM in Hamilton, CFCA-FM in Kitchener, CKLA-FM in Guelph, CKQT-FM in Oshawa, and other stations that currently provide similar programming.

There would seem little advantage to the station or to the Canadian broadcasting system in expanding a Toronto easy-listening station, and we do not believe the Redmond application presents sufficient rationale to justify use of this very scarce frequency.

B. CFMX-FM

The application by CFMX-FM would result in yet another significant technical improvement for this station. This would be a remarkable increase for a station that started in Cobourg, Ontario in 1978 and currently enjoys a signal of 100,000 watts on 96.3 FM and 86,200 watts on 103.1 FM.

The station has had several applications before the Commission and has received several approvals to allow it to obtain a powerful Toronto FM frequency. Despite these previous approvals, the station is once again before the Commission asking for further technical upgrades. The Commission has been very considerate of this station, but we submit it is highly questionable as to the merits of the Commission licensing 99.1 for CFMX.

The application claims the expanded coverage would add about 1.5 million potential listeners. In Canadian radio this would be a huge market and Telemedia submits it would be highly unusual to license such a station without an open competitive hearing.

There is considerable question whether classical music is the best use of this frequency. Despite the technical improvements received from the Commission, CFMX has consistently failed to attract a significant audience in Toronto and area. In the Fall 1991 BBM survey for all listeners 12+, CFMX had a 2.2 share. This result placed them almost at the bottom of all Toronto commercial stations.

This share is very consistent with the share of audience classical music stations can expect in any city. Telemedia commissioned a special report from Arbitron in the United States for persons 12+ all markets, total listening. The share of all tuning to classical music stations was 1.8, and of FM tuning was 2.4. In other words, classical music stations will only achieve about a 2 share of the audience of any market. To extrapolate from the 1.5 million potential audience, a 2.2 share for CFMX would result in only 33,000 additional listeners. It would seem utilizing the last "C-1" channel in Toronto for the sake of this tiny additional audience is not best use of the spectrum.

The station has continued to lose substantial amounts of money. The application indicates accumulated losses in the last eight years of $8 million. It also indicates it will cost nearly $1 million to put CFMX on 99.1, with additional annual lease payments of $100,000. This would bring the accumulated losses to $9 million.

One of the Commission's concerns in the call for these applications was the financial capability of the applicants and the financial impact of the proposed change. Nowhere in the Public Access file could Telemedia discover any proposed financial statement or proforma that would show a turnaround for this station, even though such information was requested three times from CFMX staff. As a result, the only financial information available in the application was projections based upon the status quo, which show continuing losses from 1993-1997 ranging from $643,000 in 1993 to $819,000 in 1997. The Supplementary Brief submitted by CFMX indicates its ongoing future will be jeopardized if the financial picture is not improved, yet it does not submit any evidence to show how the million dollar cost to generate 33,000 additional listeners would impact its financial future.

The simple economic reality would indicate granting 99.1 to CFMX would not be in the best interests of the broadcasting system.

C. Rawlco

As one of the many applicants at the April 1990 Toronto FM hearing, Telemedia presented a strong case for a dance music radio station in Toronto. Like all applicants at that hearing, Telemedia was asked if it was successful would the station be on the air within 12 months. Like all other applicants, including Rawlco, Telemedia replied in the affirmative. So did Rawlco. It is therefore important to note that in May 1992, more than two years after the hearing, and some 21 months after the decision, the Rawlco FM station is still not on the air and obviously will not be on the air for some additional period of time.

This is a serious breach of the first commitment made by an applicant to the Commission. The reality today is that a station licensed in 1990 may not be on the air until 1993!

Nowhere in the application submitted by Rawlco is there an explanation or defense for this peculiar position. If there is benefit to the Canadian country music industry in having a Toronto FM station, Rawlco should have been on the air and fulfilling its commitments.

Rawlco has submitted revised financial information that is significantly different from its 1990 application. To summarize the information, Telemedia has compiled a chart showing the original 1990 application, the revised application for 92.5, and the projected application for 99.1. As the Commission will note, the projections are enormously varied -- for example, for the first year of operations on 92.5 there is a million dollar difference between the 1990 application for 92.5 and the 1992 revised totals for 92.5!

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Telemedia is also concerned with the implications of this application for its stations in Orillia and Midland, Ontario. These small market stations are struggling, and encroachment of a powerful Toronto FM country music station into the Barrie and Huronia districts could have a serious and negative impact on both of these stations. Both stations have converted to country music programming in recent months, and are working hard to establish a viable local and regional audience. The Huronia area already receives country music signals from CHAM in Hamilton and CKYC in Toronto.

In fact, much of the additional area 99.1 would cover, already receives Canadian country music radio service from stations such as CKYC Toronto, CHAM Hamilton, CKGL-FM Kitchener, CHOW Welland, CHOO Ajax, and CKQM-FM Peterborough.

There is no shortage of Canadian country music available to listeners in this "footprint".

Nor do we believe there is any remarkable evidence presented as to the desire of the listening audience in this expanded area to receive Toronto country programming. In fact, in a survey of 800 respondents in the November Angus Reid survey, only 111 out of 800 respondents indicated a preference for country music. In other words, only 13.8% are even fans of country music. This research was confirmed in the February Angus Reid study when country music was ranked third among preferences and third amongst hard to find. While there is a very creative effort to develop a matrix showing two third places make a first place, the simple reality is there is no huge demand in these outlying areas for another country music signal originating from Toronto.

In Decision 90-693 the Commission made it a condition of license that Rawlco be on the air within 12 months of the August 8, 1990 decision. This has not been accomplished and no explanation has been offered by Rawlco.

As Rawlco has presented no convincing evidence of the financial difficulty facing the station and in view of the company's evident inability to get the station on the air on the frequency for which it has been licensed, we suggest the Commission instruct Rawlco to fulfill its commitment on its licensed frequency.

Telemedia would like to appear at the hearing on May 19th, 1992 to present its arguments against these applications.

Finally, we would point out there have been no additional Canadian talent development benefits proposed by any of the applicants for this large, additional market that would be served. Therefore, in conclusion, Telemedia believes all three applications for 99.1 FM Toronto should be rejected.

Sincerely yours,

Don Pagnutti/kj

Don Pagnutti
Executive Vice-President

Enc. (Fax confirmations & courier sheets)

1990 ORIGINAL RAWLCO APPLICATION (92.5)

	1992	1993	1994	1995	1996	1997
National Revenue	400,000	700,000	1,000,000	1,300,000	1,500,000	
Local Revenue	2,500,000	3,200,000	3,700,000	4,100,000	4,500,000	
TOTAL REVENUE	**2,900,000**	**3,900,000**	**4,700,000**	**5,400,000**	**6,000,000**	
Tot Oper Exp	3,614,000	4,120,000	4,482,000	4,823,000	5,122,000	
Tot Non-Oper. Ex	(152,000)	(63,000)	(36,000)	(66,000)	(138,000)	
Est. Pre-tax Income (loss)	(562,000)	(157,000)	254,000	643,000	1,016,000	

1992 REVISED RAWLCO APPLICATION (92.5)

Revenue	2,750,000	3,700,000	4,250,000	4,850,000	5,350,000
Oper Exp	3,819,000	4,217,000	4,450,000	4,695,000	4,888,000
Non-Oper Exp	452,000	543,000	600,000	636,000	657,000
Est. Pre-tax Income (loss)	(1,521,000)	(1,060,000)	(800,000)	(481,000)	(245,000)

1992 PROJECTED RAWLCO APPLICATION (99.1)

National Revenue	350,000	650,000	900,000	1,150,000	1,400,000
Local Revenue	2,900,000	3,750,000	4,200,000	4,600,000	5,050,000
TOTAL REVENUE	**3,250,000**	**4,400,000**	**5,100,000**	**5,750,000**	**6,450,000**
Operating Expense	4,024,000	4,393,000	4,661,000	4,920,000	5,176,000
Non-Oper. Expense	452,000	530,000	563,000	568,000	555,000
Est. Pre-tax Income (loss)	(1,226,000)	(523,000)	(124,000)	262,000	719,000

It is not the Commission's problem, nor the general public's problem, that economic conditions in Toronto have changed since the application. Rawlco made specific commitments based upon its own assessment of the economic climate and future of Toronto. The fact that they are two years late going on the air and that economic conditions have changed is no reason for the Commission to reward a new licensee for its delays and failure to go on the air. If Rawlco is now concerned about the economic situation for 92.5, it should simply return the license to the Commission and allow other broadcasters the opportunity to service the Toronto market.

In addition to the very serious questions raised by the financial projections of Rawlco, is the thrust of the current application. There was certainly no indication during the 1990 hearing of dissatisfaction with the 92.5 frequency.

April 28th, 1992

Mr. Allan Darling
Secretary-General of the Commission
Canadian Radio-television
and Telecommunications Commission
1 Rue du la Portage
Hull, Quebec
K1A ON2

VIA FAX: 819-994-0218

RE: C.R.T.C. HEARING 1992-5 scheduled for May 19th, 1992, Toronto.
Intervention to oppose the applications filed by:
Rawlco Communications Ltd. 912006400
Martin Rosenthal 920176500
Redmond Broadcasting Inc. 920179900

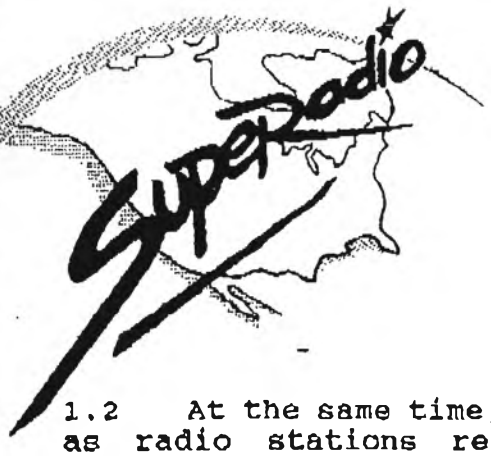
Dear Sir:

There are general and specific reasons that I oppose the aforementioned applications. I shall outline for the Commission these points herein. At the hearing, that I wish to appear at, I will elaborate on all of the points in front of the Commission during the allotted time.

This intervention will make up seven parts; section one (1.0) contains general points as to why the applications should be denied, section two (2.0) deals with application 912006400, section three (3.0) application 920176500, section four (4.0) application 920179900, section five (5.0) touches on the power myth and section six (6.0) all news. The conclusion and recommendations follow.

1.0 In general the Commission should at present not allow any further decisions to be forthcoming with regard to the Toronto market until the present recession has run its course, the outcome of the Ontario economic future becomes clearer and the players in the broadcast arena can clearly see the future of our industry.

1.1 Due to the implementation of the new FM rules, September 1991, the Commission should allow at least three years for the repercussions of those new regulations to take hold in the Toronto market and for the rating results of the Toronto stations to be reviewed as they relate to format changes.



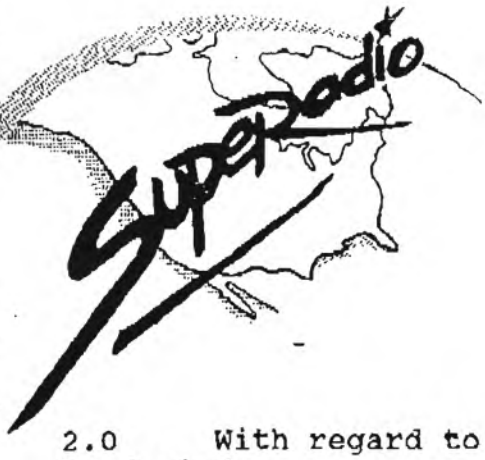
1.2 At the same time, the format shakeout in the Toronto market as radio stations relate to these new regulations with the corresponding loss or gain of radio audience due to out of market tuning, additional Can Con and local public service must be reviewed by the Commission and the stations within the market.

1.3 The Commission, with all due respect, in its descenting decision over the last Toronto hearing for the proposed final FM frequency, missed the point as to why the decision was fundamentally not in the best interest of the Canadian broadcasting system. Despite the agreement that Country Music is the right format to best service the void for the Toronto market on FM, the decision related to the "type" of service that had split the Commission. This was and still is the mute point that may of been miscalculated. As was demonstrated by hard facts and through audio demonstration at the hearing, Dance music/Black music was and is readily available in the Toronto market; as provided by CING-FM on a full time bases. And on a partial bases CFTR, Mix 99.9, CHFI, and CHUM-FM.

1.4 With regard to 1.3 above the reason the Commission should now further review its decision for the granting of the new Toronto FM to Rawlco at this moment when the awarded applicant is again before of the Commission, is because of ownership. This is a most valued opportunity. If the radio broadcast industry is to grow and not stagnate, as it has, the Commission must grant independent operators licences in markets that can afford to support these independents and start up operations.

1.5 Through decisions of the Commission that in essence awarded $30,000,000.00 in equity to one established broadcast company within one year, the system has become unbalanced. By granting two new licences in some of the most desired markets in Canada, Ottawa and Toronto, to a present operating company the opportunity for consideration to enter the broadcast industry by either a company or individual becomes extremely if not completely impossible. For this reason and the ones that deal specifically with application 912006400 for the power increase at this hearing the Commission should retract the licence to Rawlco Communications for a new FM in Toronto and recall the independent applications only in the country music mode to service Toronto.

Whyte Broadcasting • Box 24, Suite 2400 • 250 Yonge Street • Toronto, Ontario, Canada • M5B 2M8 • Fax (416) 599-3058 • Tel (416) 599-3949



2.0 With regard to the application filed by Rawlco, it should be denied.

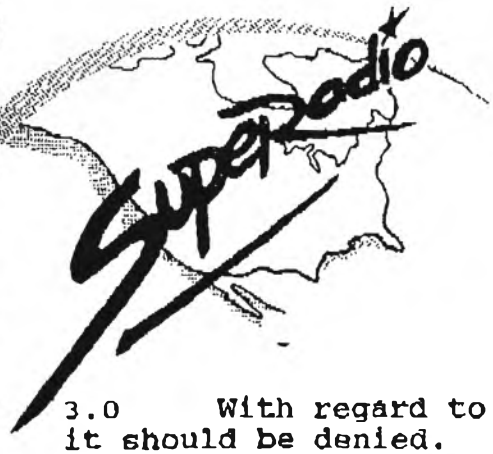
2.1 The applicant promised at the public hearing that awarded the new licence for Toronto on FM that the new country service would be on the air within twelve months of the decision. The company has not completed this basic requirement and therefore the licence should be returned to the Commission.

2.2 At the hearing for the new Toronto FM the applicants other than Rawlco also promised the Commission that they would be on air to service the community within the prescribed twelve months. These assurances were made in consideration that the technical documents filed with the Commission and approved by the DOC had elevated the applicants to the hearing, or that economic conditions within the market had been considered prior to filling of the applications and appearing in front of the C.R.T.C. These applicants in the country format should be asked by the commission to attend a special hearing to determine what time frame they could now put this service in place for the people of Toronto and a new licence issued to the best independent applicant.

2.3 The applicant also made a series of additional promises at the hearing to the Commission that due to this unneeded delay caused by this company to provide service to the community potentially may also not be completed. The Commission should consider this and again it is suggested that the licence should be returned to the Commission until the applicant can prove without any doubt that it has the devotion, desire and the financial resources to complete all of its promises to the people of Toronto and the Commission.

2.4 This applicant has demonstrated in the past a proven track record of not fulfilling its promises to the Commission as evidenced by the delay in the sign on for CFFR Calgary, the new FM service for Ottawa and now the new FM in Toronto. This blatant lack of concern for the regulations and the utilization of technical moves within the regulations should lead the Commission to call for the licence to be returned.

Whyte Broadcasting • Box 24, Suite 2400 • 250 Yonge Street • Toronto, Ontario, Canada • M5B 2M6 • Fax (416) 599-3958 • Tel. (416) 599-3949



3.0 With regard to the application filed by Martin Rosenthal, it should be denied.

3.1 Toronto is well served in the classic music area. Besides the service offered by the applicant that covers the Toronto metro service area, Toronto has seventy hours of classic music programming from CJRT. In addition the CBC FM service provides some of the best classic music service available in America to a Toronto audience.

3.2 An expanded third service to a wider coverage area provided by 99.1 for this format would not serve the public at large due to the small niche of audience for classic music listeners that are already serviced by these three classic music stations.

4.0 The application by Redmond Broadcasting should be denied.

4.1 This applicant has not yet demonstrated in the Toronto metro service area that the service provided has an appeal to the community. If the central market area has not found this service by now, expanded service will not provide the applicant with any greater market advantage.

4.2 In the event that the Commission would like to assist this applicant, an increase in power or coverage area is not the answer. Perhaps this applicant should reapply for a change to the imposed guidelines of its own promises to the Commission. Also the ratio of instrumental to vocal should be reviewed. And since Can Con is impossible to unearth in this format that the population has not heard over and over.... a review in the amount of required Can Con would better assist this applicant to compete within the market.

5.0 In the United States, where my company provides programming service to one hundred and sixty-three FM stations, 98% of these are in the B power category that CJEZ-fm and the application for Rawlco Communications has been allotted. If in radio markets like New York, Boston and Los Angeles an FM with that type of B power can be a "number one" station in the market and in most cases with less height, then transmission power must not be the great equalizer. It would seem that promotion, programming, imagination and local service would win in an already competitive market.

Whyte Broadcasting • Box 24, Suite 2400 • 250 Yonge Street • Toronto, Ontario, Canada • M5B 2M6 • Fax (416) 599-3938 • Tel. (416) 599-3

6.0 All news... what ever happened to that concept. Surely if any market in the Canada could support that format, then Toronto is it. Not only is it needed, but most likely an independent applicant who is financially strong could be licensed. This would provide diversification in ownership and badly needed jobs for Canadian broadcasters.

There is no doubt that Canada is in serious economic trouble. Some would also say that the country is having its share of political hardship. I believe that the country is also having significant trouble with the broadcasting system.

For those of us who value our broadcasting system and have come to work within the confines of the Canadian regulated broadcast structure, as I have for the past twenty-one years, the survival of the system is important. The meaningful part of this system is the people that make the day to day, in the trenches, decisions.... announcers, writers, sales people, management, and in time, if the progression is appropriate and the talent there, owners. The Commission must do whatever it can to let new blood into the ownership ranks. This is the rational taken behind the filing of this intervention. Not to cast a shadow upon the three applicants. They have their seat at the table, the system needs a bigger table and more chairs in the room.

The manner of calling this hearing and any positive outcome for the applicants aforementioned will only assist in a further breakdown of the sprits of future broadcasters across Canada. Now is the time to change the course that the Commission has taken and grant licences to new broadcasters that are willing to take the gamble of time, reputation and equity.

With so many licensed broadcasters in financial trouble, perhaps even the aforementioned applicants, how much more would the system be suffering today if the C,R.T.C. would have broadened the equity base of radio ownership? By again trying to make the club members stronger the system may hurt more rather than heal.

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Strength and wisdom must lead the system back to fundamentals that led to the granting of licences to entrepreneurs.... remember the young Edward S. Rogers and now Ted Rogers, Phillippe Beaubien, Frank Griffiths and Alan Waters. If the system leaves the present day risk takers behind, as it has, how cutting edge will the radio and television industry be for the next generation?

Thank you, for the opportunity to bring this most important point to light.

Yours truly,

Robert K. Whyte
President

cc: Rawlco Communications
Martin Rosenthal✓
Redmond Broadcast

Whyte Broadcasting • Box 24 Suite 2400 • 260 Yonge Street • Toronto, Ontario, Canada • M5B 2M6 • Fax (416) 599-2052

THE SOUND OF A DIFFERENT DRUMMER

MAY 21, 1992

RE: CRTC HEARING

It's over and we did it!

The critical 99.1 hearings have been completed and there is little doubt we were the best applicant. However this is a very complex and contentious issue. In 2-4 months we will know whether or not we have really won.

Each of you have contributed to this process. Some were directly involved. Others did extra work to cover people dealing with Commission matters. I know that this has been stressful for all concerned. We all realize how critical this effort was and Martin, Truus and I appreciate your enthusiastic support.

Even with an impaired signal, CFMX makes a difference. I hope that you have the chance to read the almost 2,000 letters submitted to the CRTC on our behalf. I wish that you all could have heard the appearing interventions for CFMX --- almost 20 people representing large art groups, small art groups, listeners, advertising agencies, retailers, etc. These people put a lot of effort into their presentations and really sang our praises. We should all feel enormous pride in the results of our hard work.

What's next, what is the future? First of all, we must maximize what we have. 96.3 is not great but we have to make the best of it. Billings are running almost 20% ahead of last year and we have to keep building on that. We simply cannot stop while the universe unfolds.

Secondly we must plan for the future with 99.1 or 96.3, so that one of the options Martin told the Commission will not come to pass.

So let's all roll up our sleeves and show the Rosenthals that there can be a future for CFMX.

Electro Sonic Inc.
1100 Gordon Baker Rd.
Willowdale, Ontario
M2H 3B3

Distributors of
Electronic
and Electrical
Components

Toronto Area Code (416)
General Office 494-1666
Order Desk 494-1555
Fax: 496-3030

electro sonic

Private Fax No. (416) 496-3045

PAGE 1 of 1

DATE: August 10, 1992

FAX NO: 372-1625

COMPANY: CFMX-FM

TO: Cobourg Office Staff

FROM: The Rosenthals

SUBJECT: CRTC Decision

MESSAGE:

Needless to say, we must have all experienced the shock of the CRTC decision last Thursday.

We are not in a position to second guess the Commission's thinking, but we have our own views on this matter. However this won't change the outcome.

The foremost question now is what will this mean for the survival of CFMX.

We will have to explore very carefully the options that are open to us.

The Commission in its decision has left the door ajar for us. We will pursue the possible relocation of the the Mississauga transmitter to downtown Toronto. This will take time, entail considerable expense with lots of testing and no guarantee of success.

Where does everyone presently fit in? Well, we must all pull together to reduce expenses and increase sales. This is absolutely imperative for the continued operation of the station. It's up to you!

We are open to any suggestions to achieve these goals.

Lynda & Frans.

If you do not receive all pages, please call back as soon as possible. (416) 494-1666.
We are sending from a Pitney Bowes 9100.

CILQ-FM
5255 Yonge Street
Suite 1400
Toronto, Ontario
M2N 6P4

Telephone (416) 221-0107
Telefax (416) 512-4810

A Division of the
Westcom Radio Group Ltd.

August 19,1993

Allan J. Darling
Secretary General of the Commision
CRTC
Ottawa, ON
K1A 0N2

RE: Application (930046800) by Martin Rosenthal, Markham,ON

Dear Sir,

CILQ-FM (Q107) Toronto **opposes** this application for the following reason:

The transmitter site proposed for CFMX-FM-1 is approximately 0.84 km from that of CILQ-FM. Both stations are denoted as Class C1, and the frequency separation between the two stations is 10.8 MHz. The Department of Industry and Science Broadcast Procedures and Rules Part III: Application Procedures and Rules for FM Broadcasting Transmitting Stations states, in Table C1, that Class C1 stations, separated by 10.8/10.8 MHz in frequency, should be separated by 48 km in distance. We understand that application of this rule is intended to minimize the possibility of the occurrence of intermediate frequency intermodulation interference (IFIM) involving the higher frequency station (CILQ-FM) causing interference to listeners of other stations.

The Department had previously permitted a relaxation of this rule when it approved the establishment of CFMX-FM-1 in Mississauga. Apparently, the IFIM situation was acceptable to listeners and to the Department.

The current proposal, siting CFMX-FM-1 on the First Canadian Place with a maximum effective radiated power of 13.3 kW will create an overlap of much higher field strengths from each station, thereby increasing the potential for IFIM interference.

. We appreciate the care and caution displayed during the testing procedures undertaken by Mr. Rosenthal: experimentation at very low power, then at a nominal effective radiated power of 2.5 kW omnidirectional and currently with a nominal maximum effective radiated power of 15 kW with the proposed directional antenna. Our own observations have indicated no problems as of August 15, 1993.

We remain concerned as to the effect that the ultimate power level of 13.3 kW may have on the quality of service of CILQ-FM. Apparently, testing performed to date at this power level has revealed no problems. However, since this application contravenes the broadcast procedures and rules, we request that it be made a condition of license that should the operation of CFMX-FM-1 demonstrate unacceptable levels of intermediate frequency intermodulation with respect to CILQ-FM, the effective radiated power of CFMX-FM-1 be reduced to such a level that this form of interference is eliminated.

Sincerely,

Rob Enders
Director of Engineering

CC:Martin Rosenthal, CFMX-FM

ENGINEERING BRIEF

FOR

NEW FM BROADCASTING STATION

ON THE CN TOWER

TORONTO, ONTARIO

APPLICANT: Martin Rosenthal

PROJECT: MRTOR

IMAGINEERING LIMITED

TORONTO, ONTARIO

DECEMBER 1984

SUMMARY SHEET

APPLICANT:	Martin Rosenthal, c/o Electrosonic, 1100 Gordon Baker Road, Willowdale, Ontario. M2H 3B3
STATION LOCATION:	Toronto, Ontario.
STATION CALL:	New
CO-ORDINATES OF ANTENNA:	43° 38' 33" N. Lat. 79° 23' 15" W. Long.
TRANSMITTER POWER:	1695W
TRANSMISSION LINE EFFICIENCY:	79.8%
ANTENNA POWER GAIN:	2.96 (4.71 dB) rel. to a dipole
EFFECTIVE RADIATED POWER:	4 KW
EHAAT:	420.6 m (1380 ft.)
CHANNEL NUMBER:	247B
FREQUENCY:	97.3 MHz

ENGINEERING BRIEF
FOR A
NEW FM BROADCASTING STATION
ON THE CN TOWER
TORONTO, ONTARIO

1.0 INTRODUCTION

Imagineering Limited, Toronto, Ontario, has been retained by Martin Rosenthal to prepare an Engineering Brief for a new FM broadcasting station in Toronto, Ontario, using channel 247B.

2.0 DISCUSSION

The proposed channel has been taken from the FM allotment plan and is the only channel left in the Toronto area. This channel has a fourth adjacent relationship with CHFI-FM which presently operates from the CN Tower. Existing FM guidelines would require that the ratio of fourth adjacent stations does not exceed 10 dB within the 100 dBu contour. This would be very difficult to accomplish from separate sites since, very likely, there would exist areas close to the site where the nearest station signal would exceed the other by more than the required ratio.

Co-siting with CHFI-FM (and others) on the CN Tower will ensure that, barring differential fading, the ratio of the two signals would be maintained at a constant 10.4 dB ratio, which is equivalent to the difference between the ERP's of the two stations.

In the interest of uniformity, profile elevation data used in the establishment of EHAAT was that supplied by Mr. Gordon Elder, P.Eng., who had prepared this information on behalf of CN Tower Limited. Copies of these terrain profiles are included in this brief. These are the same profiles which have been supplied to the consultants of the various broadcasters operating from the CN Tower by Mr. Elder as part of the standardization of site data.

... 2/

3.0 ASSUMPTIONS AND SOURCES OF INFORMATION

This brief was prepared in accordance with the Department of Communications procedures 4 and 6. The new D.O.C. metric F(50,50) curves were used to estimate the coverage contours.

The channel was selected from the Canadian FM Allocations Plan for Commercial Channels (revised August 1, 1983) which included the availability of channel 247B in Toronto.

In the interest of uniformity, profile elevation data used in the establishment of the EHAAT values were those supplied by Mr. Gordon Elder, P.Eng., who had prepared this information on behalf of CN Tower Limited.

Copies of these profiles are given in Figure 4, which are photocopies of those already filed by the various television and FM broadcasters on the CN Tower and were supplied to their consultants by Mr. Elder as part of the standardization of site data.

4.0 EQUIPMENT

A summary of the proposed equipment is included in the Appendix. This brief is based on the use of the EMI omni-directional antenna presently used by the consortium of FM broadcasters on the CN Tower. This antenna will be fed by a Collins Radio type 831D-2 transmitter at a power level of 1695W.

With the approval of the Department, the applicant reserves the right to modify the equipment in this brief, in order to take advantage of cost effective alternatives which may be made of equipment manufacturers at the time of implementation, of the station proposed in this brief.

The proposed station will broadcast in the stereophonic mode and will meet fully the standards set forth in BP-6 and will be operated in such a manner as not to degrade the overall performance of the station.

... 3/

5.0 DESCRIPTION OF ANTENNA SYSTEM

5.1	Overall height of structure	542.5 m AGL 624.5 m AMSL
	Average elevation of terrain	117.3 m AMSL
	Elevation of radiating centre	455.7 m AGL 538.0 m AMSL 420.6 m EHAAT

This information is illustrated in Figure 1.

5.2 The antenna is circularly polarized with a power gain of 2.96, omni-directional in the horizontal plane.

5.3 The relative vertical field intensity pattern is contained in Figure 3.

5.4 The antenna will be fed by means of a 15.56 cm (6-1/8") coaxial transmission line system. The efficiency of the feed system (line and a combiner) is expected to be 79.8%, as determined below:

The total loss in the sytem of 0.980 dB of which 0.25 dB can be contributed to feeder loss, and 0.73 dB to total combiner losses.

The combiner loss is made up of the following:

original 5 modules	0.35 dB loss
CJRT-FM module	0.13 dB loss
CILQ-FM module	0.05 dB loss
CFNY-FM module	0.1 dB loss*
Future 97.3 MHz module	0.1 dB loss*
Total combiner loss	0.73 dB loss

* Note: These two numbers are estimated based on suppliers' proposals.

A loss of 0.98 dB is equivalent to an efficiency of 79.8%.

... 4/

6.0 INTERFERENCE

The possibility of this proposed station causing inteference to other broadcasting undertakings was investigated and is summarized below.

6.1 IF Relationship

Station CING-FM in Burlington, Ontario is the only station in the coverage area of the proposed station which is 10.7 MHz separated from the proposed station. This separation may cause local oscillator interference between receivers in neighbouring residences.

6.2 Harmonic Interference

There are no broadcast television channel locations harmonically related to the chosen FM channel in the proposed coverage area, therefore interference of this type should not occur.

6.3 Ghost Type Interference

There are no television stations in the vicinity of the CN Tower to which ghosting interference could be caused by the antenna support structure of the proposed FM station. Therefore, this type of interference should not occur.

6.4 Intermodulation Interference

Table 1 lists all the FM stations considered in the intermodulation study. Table 1 also shows all possible intermodulation combinations in which the proposed station is a contributor. The applicant undertakes to remedy any interference complaint deemed reasonable by the Department of Communications due to its operation on the CN Tower.

... 5/

6.0 INTERFERENCE

6.4 Intermodulation Interference (continued)

A study was also made of the close-in field intensities around the antenna and it was found that the 115 dBu contour does not extend to the tower base. The area where the signal level exceeds 100 dBu forms a belt around the tower with inner and outer radii of 257 and 402 meters respectively. These distances were established by the methods outlined in Notice to Broadcast Consultants #51, issue 4. The contours are illustrated in Figure 5. The maximum signal level within the belted area is expected to be 103.1 dBu.

Table 2 lists the aeronautical communication and navigation frequencies that might be intefered with by the harmonics and/or intermodulation products generated by the FM and TV station transmissions from the CN Tower and downtown core.

The aeronautical frequencies listed are those used by the three main airports in the Toronto area. These are L.B. Pearson (Toronto) International, Toronto Island Airport and the Department of National Defence's Downsview Airport. For the frequencies denoted by "VH" in the list, the call names are acronyms for the type of usage, by the various airports, the particular frequency is used for. These were obtained from the Ministry of Transport's publications CANADA AIR PILOT EAST Winnipeg to Atlantic Ocean or IFR Supplement Canada and North Atlantic IFR Terminal and Enroute Data. Acronyms ending in a "D" or an "I" indicate frequencies used at Downsview and the Island Airport respectively. Those ending in a "T" or any other letter than those above, indicate a frequency used at L.B. Pearson (Toronto) International Airport.

The intermodulation products in Table 2, marked with an asterisk "*" beside them, are products, generated by the proposed FM station in this brief, that might cause interference.

... 6/

6.0 INTERFERENCE

6.4 Intermodulation Interference (continued)

The applicant is prepared to provide appropriately specified filters to solve any such problems that might arise, if their need is determined by M.O.T. flight surveys.

6.5 Short Spacing

The List of Canadian FM Allotments for Commerical Channels (dated August 1st, 1983) and the FM American Allocations and Assignments (dated August 1, 1982) were searched for any allocations or assignments which were short-spaced to the proposed operation on Channel 247B in Toronto, Ontario. The following stations were identified as being short-spaced.

CALL	LOCATION	CHANNEL	REQ'D DIST.	ACTUAL DIST.
CJQR-FM	St.Catharines	249B	94.0 km	61.3 km

Zone 1 of Figure 8 depicts the area where the field strength of the proposed new FM station is 20 dB greater than that of CJQR-FM, St.Catharines.

A similar situation already exists with another second adjacent station to CJQR-FM, CHFI-FM, channel 251C1, which already transmits from the CN Tower.

CHFI-FM has an ERP 10.4 dB above that of the proposed station, so that the interference to CJQR-FM, due to the proposed station, should be considerably less significant than the interference which already exists from CHFI-FM.

... 7/

6.0 INTERFERENCE

6.5 Short Spacing (continued)

Zone 2 depicts the area where CJQR-FM may interfere with the reception of the signal from the proposed new FM station.

In general, the applicant undertakes that he shall remedy any complaints of overloading, blanketing, and any other type of interference to the reception of broadcast and other radio services caused by the operation of this broadcasting undertaking, and shall take prompt and appropriate action to correct such adverse effects bearing all costs involved, unless such complaints are of a type judged not valid by the Department of Communications, pursuant to specific Department Rules, or Notices and Procedures applicable to the particular operation of this broadcasting undertaking or otherwise.

7.0 MONITORING

Frequency monitor and modulation monitors are indicated in the Appendix. The modulation monitor will provide the following measurements:

(a) Total modulation of the main carrier by the main channel.
(b) 19 KHz pilot rejection level.
(c) Carrier frequency and pilot frequency.
(d) FM noise, AM noise, and incidental A.M.

8.0 LOCATION OF SERVICE AREA CONTOURS

Location of the 3 mV/m (69.5 dBu), 500 uV/m (54 dBu), and 50 uV/m (34 dBu) contours were established using the new metric F(50,50) curves from the D.O.C.

... 8/

8.0 LOCATION OF SERVICE AREA CONTOURS (continued)

The transmitter power for an ERP of 4 KW was found as follows:

$$\text{Transmitter Power} = \frac{\text{ERP MAX.}}{\text{Antenna maximum power gain X transmission line efficiency}}$$

$$= \frac{4 \text{ KW}}{2.96 \text{ X } 0.798} = 1695\text{W}$$

Note: The antenna maximum power gain of 2.96 is in the horizontally polarized plane and the vertically polarized plane and the resulting maximum ERP is likewise in each of these polarizations.

SERVICE AREA CONTOURS

RADIAL NO.	AZIMUTH (DEG)	ERP (KW)	EHAAT (M)	DISTANCE IN KM TO 3 mV/m	500 uV/m	50 uV/m
1	0	4.0	386.8	28.5	59.5	107
2	45	4.0	403.3	29.5	60.5	108
3	90	4.0	463.0	32.0	64.0	113
4	135	4.0	463.0	32.0	64.0	113
5	180	4.0	463.0	32.0	64.0	113
6	225	4.0	463.0	32.0	64.0	113
7	270	4.0	423.1	30.5	61.5	110
8	315	4.0	384.4	28.5	59.0	107
	Average:		420.6 m			

Over water radials 3 and 4 have not been used in the EHAAT computation.

9.0 FEED SOURCE

It is proposed to feed this station by means of a UHF studio-transmitter link.

... 9/

10.0 EXPIRY DATE

In the event that this technical brief is not submitted to the Department of Communications, Ottawa, for approval within two months of the date on the title page of the brief, it should be returned to Imagineering Limited for possible revision prior to submission.

11.0 QUALIFICATIONS OF ENGINEERS

-The qualifications of the engineers participating in the preparation of this brief are on file with the Department of Communications, Ottawa, Ontario.

James Morrison, B.A.Sc.,
Engineer in Training
IMAGINEERING LIMITED

E.A. Bogdanowicz, P.Eng.,
IMAGINEERING LIMITED

APPENDIX

EQUIPMENT LIST

TORONTO, ONTARIO.

ANTENNA:	EMI (now Allen B. Dick Limited)Antenna, Circularly Polarized, Power Gain of 2.96
TRANSMISSION LINE:	15.56 cm (6-1/8") Coaxial Transmission Line System
TRANSMITTER:	Collins 831D-2FM Transmitter Collins 786V-1 Stereo Generator
INPUT AND MONITORING EQUIPMENT:	Amplifier/Limited: 411 Volumax Peak Controller. 4550A Audimax Level Controller. FM Frequency Modulation Monitor: Belar FMM-1 Stereo Frequency and Modulation Monitor: Belar FMS-1

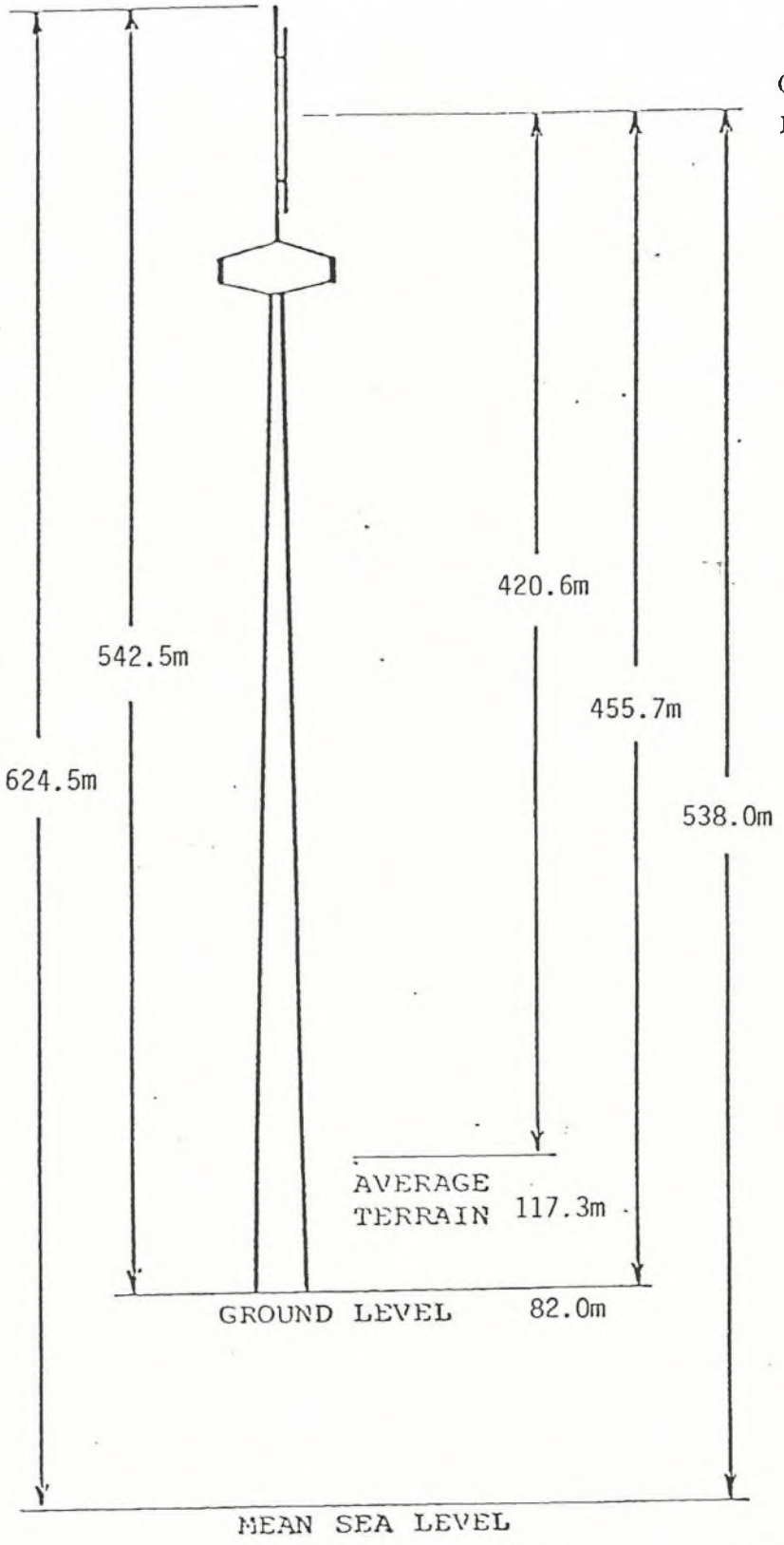


FIGURE 1

ELEVATION DIAGRAM

NEW FM TORONTO, ONTARIO

CH. 247B, 4KW ERP, 420.6m EHAAT

PROJECT: MRTOR SEPTEMBER 1984

IMAGINEERING LIMITED TORONTO, ONTARIO

FIGURE 5

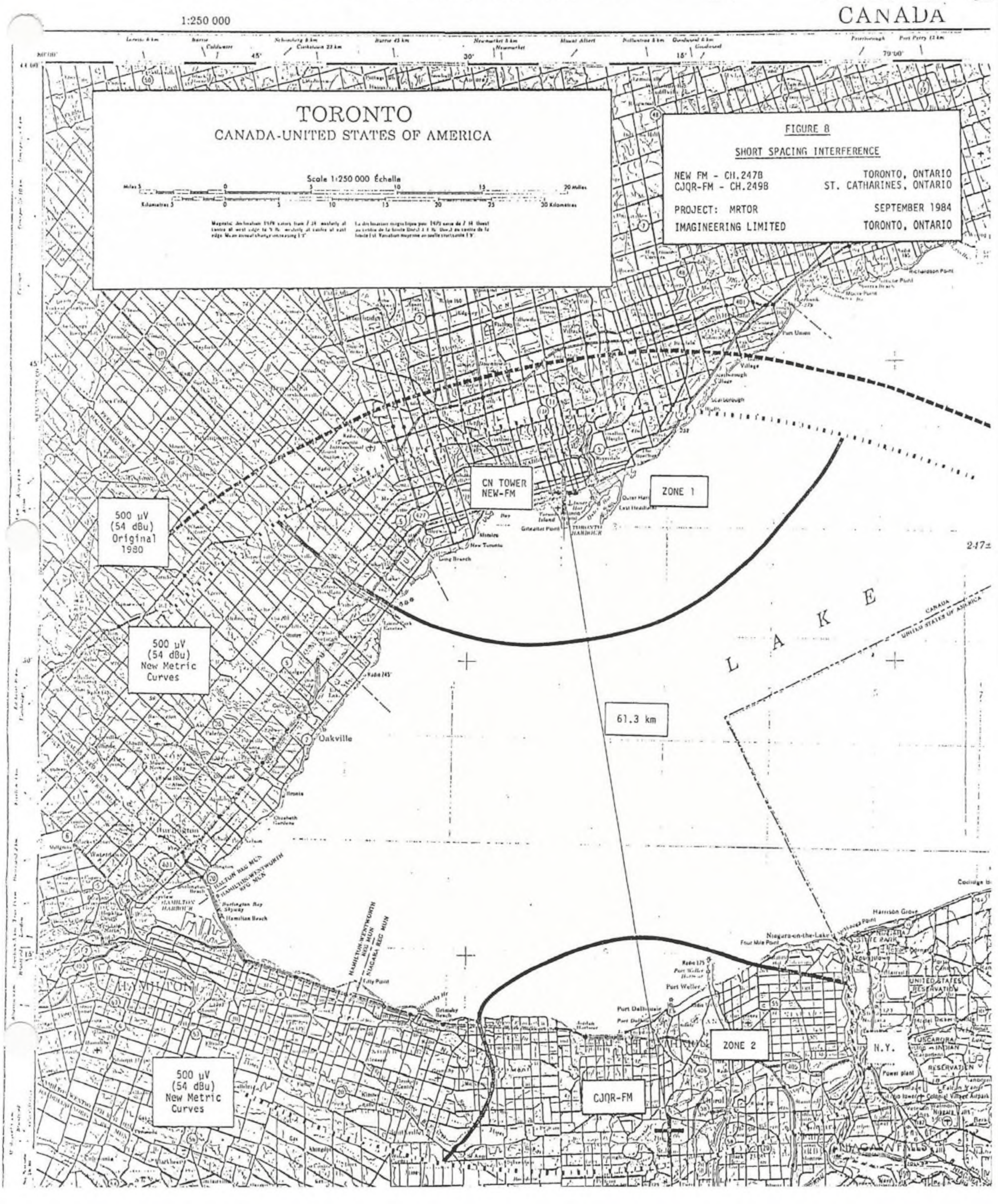
SITE AND 100 dBu CONTOUR MAP

NEW FM TORONTO, ONTARIO

CH. 247B, 4KW ERP, 420.6m EHAAT

PROJECT: MRTOR SEPTEMBER 1984

IMAGINEERING LIMITED TORONTO, ONTARIO


1:250 000
CANADA
TORONTO
CANADA-UNITED STATES OF AMERICA
Scale 1:250 000 Échelle
FIGURE 8
SHORT SPACING INTERFERENCE
NEW FM - CH.247B TORONTO, ONTARIO
CJQR-FM - CH.249B ST. CATHARINES, ONTARIO
PROJECT: MRTOR SEPTEMBER 1984
IMAGINEERING LIMITED TORONTO, ONTARIO
CN TOWER
NEW-FM
ZONE 1
500 µV
(54 dBu)
Original
1980
500 µV
(54 dBu)
New Metric
Curves
61.3 km
Oakville
L A K E
ZONE 2
N.Y.
500 µV
(54 dBu)
New Metric
Curves
CJQR-FM

TO: MR

FROM: Jerry

DATE: 22Apr'87

RE: CRTC HEARING 16Apr'87

Overall impressions --- We were warmly greeted by the Commission and treated with respect. They wanted to know more about CFMX and our philosophies/problems than they wanted to know about the topic at hand --- networking and syndication. It was certainly no problem to get them to talk about CFMX so Alf's plan to use this Hearing to tell our story again certainly did work. We clearly have strong allies on the Commission.

As you requested, I also met with CRTC Staff to discuss CFMX:

1. There is a VERY strong feeling that YOU should lobby the Commission IN PERSON --- in particular Bureau, Coupel, Robson (even though he almost certainly will leave the Commission in October). Terrian and Gower would be the next best people to see. There is a new Commissioner named McCrea who seemed very interested in us --- I would add him to the must see list.
2. I don't think this is something you are interested in but everytime I get around the Staff they bring it up --- why don't we distribute CFMX via satellite across the country to cable companies and low power repeaters...?
3. They also always bring up Pickering, Ajax, Oshawa --- isn't there something available in these areas that would get the signal into Toronto?
4. Re Toronto itself:
   A. CING complicates application. It is on the block and new owners will want (need) to get it onto another frequency.
   B. Whole issue of diversity vs. local input needs to be dealt with. Obviously some of the competing applications will be based on localness.
   C. A Toronto based, "arms length" Friends of CFMX being very active re the Application would REALLY help.
   D. The Commission does feel that there is a lot of classical music already in Toronto - CBC AM & FM, CBC French AM (and soon FM), CJRT, CIUT, CKDS in the evening, CFRB in the evening (and soon CJEZ), etc. We will need a large chart showing classical music needs....we will really need to lean on consistent and accessible angles.

As you know, there are CRTC Hearings in Toronto next week. I'd like to spend quite a bit of time there and chat with Commissioners and Staff, hear what's being said about applications, etc. To repeat, the strongest message I got was how important it would be for YOU to conduct a lobby at the CRTC.