April 30, 2002

Mr. Michael Helm
Director General
Telecommunications Policy Branch
Industry Canada
300 Slater Street
Ottawa ON
K1A 0C8

Via Facsimile: 998-1256
Original by mail

Dear Mr. Helm:

Re: ***Consultation on Revisions to Spectrum Utilization Policies in the 3-30 GHz Frequency Range*** **(Gazette Notice, DGTP-001-02)**

Canadian Satellite Communications Inc. ("Cancom") and Star Choice Television Network Inc. ("Star Choice") are pleased to submit the following comments in response to the Consultation on Revisions to the Spectrum Utilization Policies in the 3-30 GHz Frequency Range (Canada Gazette Notice DGTP-001-02 dated 2002-01-19). The bands with respect to which we will make comments are:

- Conventional C-bands 3700-4200 MHz and 5925-6425 MHz
- Conventional Ku-bands 11.7 –12.2 GHz and 14.0 –14.7 GHz
- Ka-band 28.35 – 28.6 GHz and 18.3 –18.5 GHz
- Ka-band 29.25 – 29.5 GHz and 18.58 – 18.8 GHz

In total, Cancom and Star Choice currently utilize 3 C-band transponders on Anik F1 and 45 Ku-band channels of Anik F1 and E2. In addition Cancom and Star Choice are planning to use the Ka bands once satellite capacity is launched.

The Roles of Cancom and Star Choice

Cancom

Cancom was first licensed in 1981 as a national satellite relay distribution undertaking ("SRDU") by the Canadian Radio-television and Telecommunications Commission (the "CRTC" or "Commission").[1] Its SRDU licence permits Cancom to deliver a wide range of broadcast signals to broadcasting distribution undertakings ("BDUs") – primarily small cable companies – via satellite.

In carrying on business as an SRDU, Cancom fulfills the primary regulatory objective that the CRTC established for it: the extension of broadcasting services to remote regions not otherwise provided with a comprehensive broadcasting service.

The objective of extending public and private Canadian broadcasting services to all parts of Canada has been pursued by the CRTC since its own inception, as it has tried, through various initiatives, to address unequal service between large urban areas and isolated communities. In 1980, a committee chaired by CRTC Vice-Chair Réal Therrien, which reported on problems with respect to services to northern and remote communities, recommended that the CRTC take immediate action to license delivery of a wide range of Canadian satellite television and radio services to those communities. Cancom's licence was granted shortly after that report was tabled, and Cancom has been helping to fulfill the important public policy objective of remote service since its network became fully operational in January 1982.

Star Choice

Star Choice provides a direct-to-home ("DTH") satellite service pursuant to a CRTC licence issued in 1996.[2] It delivers a full range of programming services directly to Canadian subscribers. Key public policy objectives underlying the licensing of DTH service in Canada included the establishment of dynamic competition to cable, enhanced distribution of a wide range of Canadian programming services to all parts of Canada, and a desire to limit the uptake of unauthorized U.S. satellite services.

Star Choice has fulfilled these and other broadcasting policy objectives and is committed to continuing to do so. It provides the efficient delivery of programming at affordable rates[3] to approximately 750,000 subscribers – many of whom may otherwise have taken U.S. DTH service. Star Choice has also extended a range of broadcasting services to all Canadians[4], including about 350,000 rural households, over 200,000 homes that have no access to cable and more than 60,000 homes that lack access to the signal of any private

---

[1] Decision CRTC 1981-252
[2] Decision CRTC 96-529
[3] *Broadcasting Act*, s. 3(1)(t) – *Broadcasting Policy for Canada*
[4] *ibid.*, s. 3(1)(k) – *Broadcasting Policy for Canada*

Canadian broadcaster. As an all-digital broadcasting service, Star Choice has also helped drive digital broadcasting distribution in Canada and provided an incentive to cable companies to convert to digital[5]. Canadian consumers and programmers[6] benefit from this conversion and the expanded capacity for program service carriage that it permits.

Cancom and Star Choice respectfully submit that it is important to take into account the public policy objectives that they serve, and their respective successes in fulfilling those objectives, in any consideration of revisions to spectrum utilization policies.

Conventional C Bands 3700 –4200 MHz and 5925 – 6425 MHz – The Evolution of Usage

In the years since the launch of the first Anik satellite, the use of the above-noted C bands has changed dramatically. Spectrum that was initially the basis for the trans-Canada terrestrial communication backbone has become, instead, the basis for the trans-Canada satellite communications backbone. While much of the original terrestrial network has been decommissioned and replaced by fibre optics, the satellite network continues to expand. Today there are about 30 C-band satellites that have received capability in Canada.

In response to the fundamental reorientation in the use of the C bands which has occurred, Cancom and Star Choice respectfully recommend that they be reserved, going forward, for FSS uses and that:

1. a moratorium be placed on the issuance of new terrestrial (FS) licenses for these frequency bands, particularly in the receive band, and

2. existing links be discouraged.

Cancom's Use of C-band Transponders

Cancom currently has long-term leases on 3 transponders on Telesat Canada's Anik F1 satellite. These transponders are used to distribute television programming to over 8 million households in Canada via approximately 2600 cable headends. As noted above, delivery of over-the-air broadcasting services to broadcasting distribution undertakings (such as cable companies) in rural and remote communities is the basic rationale for Cancom's SRDU licence. It means that Canadians living outside of urban areas have access to a similar range of programming services as those who live in highly populated areas served by large cable companies. It also means that those Canadians have a choice, like their urban counterparts, of receiving their broadcasting services from DTH or from a broadcasting distribution undertaking using Cancom.

[5] *ibid.*, s. 3(1)(d)(iv) – *Broadcasting Policy for Canada*
[6] *ibid.*,s. 3(1)(d)(ii) and (e) – *Broadcasting Policy for Canada*

Managing Interference is Increasingly Problematic

Historically, terrestrial uses of the C bands did not interfere with satellite communications uses because Telesat sites were located in remote areas and Telesat had 24 transponders around which to move traffic if a site had frequency co-ordination restrictions. Movement was also relatively easy because there was only one channel per transponder.

Today, decades after the inception of Telesat, many changes have occurred which make managing interference increasingly difficult. Since the 1980s, Telesat sites have been placed in cities where Cancom shares spectrum with many terrestrial users. Moreover, Cancom is restricted to moving traffic only among three transponders assigned to it. This situation is further complicated by the fact that, in Cancom's case, one transponder can have eight video services utilizing FDM digital compression being transmitted from four different uplink sites.

Under today's conditions, restoration of service due to a complete satellite transponder failure (primary or backup) is extremely difficult. It can take up to a week to conduct a microwave interference investigation alone. Extended outages have a serious effect on broadcasting distribution undertakings and their customers.

Public Policy Objectives Support Use of C Bands for Satellite Uses

Public policy supports a limitation on terrestrial uses of the C bands to reduce interference and assist with co-ordination of receive spectrum for point to multipoint FSS broadcasting systems such as Cancom. Canada's *Broadcasting Act*[7], which governs SRDUs and BDUs, recognizes that the broadcasting system is an essential public service.[8] It also requires licensed distribution undertakings – which include cable companies served by Cancom – to "provide efficient delivery of programming at affordable rates, using the most effective technologies available at reasonable cost."[9] Moreover, as explained in detail above, Cancom serves critical public policy objectives concerning the provision of broadcasting service to rural and remote areas of Canada.

Notably, while spectrum management and licensing is under the jurisdiction of Industry Canada, the *Telecommunications Act*[10]suggests that in matters of spectrum allocation by common carriers, the CRTC may intervene in favour of particular broadcasting undertakings. The Commission may do so if it believes such allocation will further the implementation of broadcasting policy. As such, there is a suggestion that broadcasting uses should enjoy priority in certain circumstances relating to the use of radio spectrum.

---

[7] S.C. 1991, c. 11
[8] *ibid*., s. 3(1)(b)
[9] *ibid*., s. 3(1)(t)
[10] *Telecommunications Act*, S.C. 1993, c.38

Potential Harm to FSS Outweighs Any Benefit of C Band Allocation to Terrestrial Uses

The high number of users dependant upon FSS and the high degree of spectrum reuse by FSS in North America means that interference with FSS receive sites from terrestrial uses is frequent and can have widespread impacts. It also means that frequency co-ordination becomes extremely challenging. As discussed below, the incremental benefit of allocating additional capacity to point-to-point terrestrial links is outweighed by the consequences of potential impacts of such an allocation on the provision of satellite services.

Fixed Satellite Services Make Optimal and Efficient Use of the Bands

Cancom's use of C-band spectrum is optimized because the traffic is point-to-multi-point, with potentially 2600 receive sites per service. FS use, on the other hand, is point-to-point and cannot, by its nature, be optimized to provide this level of benefit.

Similarly, spectrum re-use for satellites is already optimized. There are over 30 C-band satellites above North America on approximately 3 degrees spacing, which utilize dual polarities. Terrestrially, this would equate to potentially 240 links per frequency assignment at a given tower site. This level of spectrum re-use cannot be matched in the context of FS use.

Cancom has experienced significant difficulty in co–ordinating receive spectrum for its point-to-multipoint FSS system. With a potential of up to 2600 receive sites for a particular service (which service is diversified across Canada based on the demands of end-user cable companies for particular broadcast programming services), the probability of interference from terrestrial sources somewhere in the network is always high. In these cases, the site owner will often attempt to shield the receive antenna. Unfortunately, even with such a response, in many cases reception is still not possible due to the overwhelming local interference.

As a result, Cancom strongly recommends that not only should there be no increased terrestrial use of the C bands, but, in future, terrestrial uses should be discouraged as current uses cease going forward.

Band-Sharing by Frequency or Geographical Diversification is Not Practical

In its call for comments, Industry Canada has sought input on a proposal that the C bands Cancom be shared by FS and FSS on a (dual) primary basis, either by frequency separation or by geographical separation. It is the opinion of Cancom and Star Choice that neither concept presents a workable solution.

Geographical Separation

Geographical separation would not be practical for the receive band as there are currently numerous U.S. and other foreign satellites with some level of coverage in Canada. This

coverage is generally limited to the southern portions of Canada. Unfortunately, this would also be the area where the bulk of the terrestrial links would be situated.

There may be some merit to the concept of geographical separation for the transmit frequencies, but again the reality of users not being able to access all the C-band satellites in orbit is too restrictive for a location such as southern Quebec.

Historically Telesat's teleports were in very remote sites to ensure interference separation. During these times, signals were microwaved to the sites for subsequent transmission to the satellite. This was not an efficient use of spectrum. As satellite transmit antenna sizes decreased due to increased satellite sensitivities, it became possible for a smaller dish, in conjunction with an earth berm, to co-exist with local terrestrial microwave links, permitting the construction of teleports in urban areas.

While frequency co-ordination with the local terrestrial links is difficult, as discussed above, it is likely easier and more cost effective than locating teleports in remote areas. As a result, Cancom and Star Choice recommend strongly against the introduction of geographical separation for transmit sites that would alter the existing location of FSS sites.

Frequency Separation

The concept of separating the band into two portions – serving both FS and FSS, on an exclusive basis, is also unworkable.

On the receive side, this concept is unworkable due to the fact that there are already approximately 30 C-band satellites in orbit – all utilizing the same transponder frequency channel plan.

On the transmit side, if frequency separation were put in place, FSS providers would lose access to a portion of the available satellite fleet, putting Canada in a capacity deficit and jeopardizing the fulfillment of public policy objectives in connection with satellite broadcasting. Additionally, such a change would confront Telesat with a sizable capital investment which would be unusable and Telesat would likely attempt to pass-through of the costs to satellite users.

In determining the type of traffic associated with these frequencies historically, priority has been given to the overall capacity of the traffic. Cancom and Star Choice submit that consideration should also be given to the public benefit of the traffic. In many cases the FS service is fundamentally one of point-to-point – one signal, one user. In the case of FSS services, particularly Cancom's, the traffic is point-to-multi-point. One signal potentially serves millions of end-users with an essential public service – broadcasting. In granting access to frequencies, Cancom and Star Choice respectfully submit that priority should be given to services on the basis of public benefit that they generate.

Conventional Ku Bands 11.7 –12.2 GHz and 14.0 –14.7 GHz

While we understand that there has been no discussion about changing the conventional Ku bands from Primary FSS to Co-primary FS/FSS, Cancom and Star Choice wish to emphasize that any such change would have a devastating effect on the Star Choice DTH network. For that reason, we urge that no additional users be permitted in those bands.

As noted above, Star Choice has approximately 750,000 subscribers in Canada, more than half of whom reside in rural areas (and as such have limited broadcast distribution alternatives) and one-third of whom do not have access to cable service. Furthermore, Star Choice currently serves more than 60,000 subscribers who, due to their remote location, do not even have over-the-air access to television broadcast signals of any private broadcaster.

As we have indicated in previous letters, any additional interference at Star Choice receive sites would render them inoperative. The licensing of terrestrial links or non-geo-stationary satellites in the receive band would cripple reception.

Additionally Cancom and Star Choice believe that any band-sharing by means of geographical or frequency separation would be impractical for the same reasons cited in connection with the discussion of band-sharing on C-band spectrum.

Ka-band 28.35 – 28.6 GHz and 18.30 –18.5 GHz
Ka-band 29.25 – 29.5 GHz and 18.58 – 18.8 GHz
Ka-band 29.50 – 30.0 GHz and 19.70 – 20.2 GHz

Cancom and Star Choice have three comments regarding these band pairs.

The first is that all three bands pairs should ultimately become primary use by FSS. This will enable the continued and enhanced provision of broadcasting services to remote areas of Canada, as well as the potential for the provision of interactive satellite services. All of the arguments presented above in the C-band section are again applicable to support this statement.

The second comment is that the second band pair is slightly asymmetrical in that it has 250 MHz of bandwidth for uplink use, but only 220 MHz for downlink. As most satellites today are being constructed basically as bent pipes (what goes up, comes down), asymmetry would force the satellite owner to either abandon this 30 MHz or to build a satellite with substantial intelligence (modulation or error correction changes for instance) – a form which most owners are shying away from because of the reduced reliability and inflexibility.

The third comment with respect to these bands is that all restrictions placed on their use by Canadian footnote 16A be removed.

Adjacent Band Usage

Cancom and Star Choice additionally request that consideration be given in the future to limiting energy levels in bands adjacent to the receive bands of the above-mentioned band pairs. Continual problems have been encountered by Cancom's customers which trace back to high-power directional transmissions in bands adjacent to the FSS receive frequencies.

With respect to C-band reception, these transmissions appear to be marine or airborne radar systems. In the Ku-band, products such as commercial building door opener controls and the leakage from auto radar detectors have proved troublesome. These emissions are of such a high energy level (in comparison to the satellite signal) that they can inhibit the reception of the satellite signals by saturating the receive amplifiers. The required dynamic range of an LNB capable of handling both signals simultaneously is next to impossible to accommodate. Additional filtering to attenuate these unwanted signals prior to amplification are costly, sometimes ineffective, and detrimental to the overall performance of the reception system.

Licensing of additional high-power uses (particularly involving mobile services) in bands adjacent to the three receive bands commented upon in this submission on would therefore be detrimental to the services of Cancom and Star Choice, particularly if these services are mobile.

Cancom and Star Choice thank Industry Canada for the opportunity to provide these comments. Please do not hesitate to contact us with any questions that you may have in connection with this submission.

Yours truly,

Cynthia Rathwell
Vice-President, Regulatory Affairs