

**Canada Gazette Notice DGTP-003-08
Consultation Paper on the Possible Use of the Extended-Ku
Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting
Services**

Fixed Service Providers Reply Comments

Introduction

Bell Canada, Harris Stratex Networks LLC, TELUS Communications Company, and Rogers Communications Inc. (collectively, “the Fixed Service Providers”, or “FSP”) are pleased to provide the following reply comments in response to comments that were filed regarding Canada Gazette Notice DGTP-003-08, Consultation Paper on the Possible Use of the Extended-KU spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services (the Consultation Paper).

Having reviewed the comments of the satellite providers, we urge Industry Canada to reject the proposal to allow the extended Ku band to be used for Direct to Home broadcasting services.

The FSP group does so based on the following points made in its initial submission and the points raised by other commenting parties.

In our comments, the FSP group made the following main points:

- The extended Ku band was intended by SP 3-30 to be used on a shared basis on a first come first served basis. The use of the extended Ku band for DTH usage will effectively deny the Fixed Service (FS) access to that spectrum, since it would be impossible to coordinate with the many thousands of small DTH earth stations belonging to the general public, particularly where broadcasting signals are involved. We remind the Department that in our original response we said “We strongly believe that any change in the spectrum utilization policy to accommodate the provision of DTH broadcasting services in this band, would by nature, initiate a fundamental change in the way the satellite earth stations are deployed. Rather than having a defined set of locations, these stations would pop up and disappear randomly in a ubiquitous fashion as consumers start or terminate their subscription for DTH. For this reason, coordination between

FSS DTH services and fixed services would be impractical, and thus these services would not be compatible in the band.”¹

- The extended Ku band is critically important for the FS to meet the expected demand for wireless backhaul to support the explosive growth of the 3G and 4G mobile broadband services. This band has the ideal mix of favorable propagation characteristics and the ability to use relatively small antennas for the purposes of backhauling mobile traffic. Although much is made of Star Choice having close to 900,000 customers the wireless carriers have 21,000,000 customers, all of whom depend on the smooth functioning and growing capacity of these systems to handle their mobile telecommunications needs. Constraining FS capacity in such a useful backhaul band would constrain the ability of wireless carriers to support 3G and 4G, including bandwidth-intensive services. For this reason, the FSP group is firmly opposed to the proposal. SaskTel said as much in its comments where it states that “SaskTel foresees significant growth in requirements for backhaul services due to rapid growth of 3G and 4G networks. The 11 GHz band has favourable propagation properties well suited for backhaul links. The remaining portions of the 11 GHz band unaffected by the DTH proposal are already crowded in most major urban centers, making it necessary in many cases to look at other alternatives, including other bands.”²
- The formal spectrum policy review that resulted in the publication of SP3-30 in late 2004 was the basis for regulatory certainty allowing both FS and FSS industries to plan and commit resources, including R&D activity, network planning and operations. The subsequent calls for obtaining and deploying satellite resources were within the framework of the spectrum utilization policy and not for a change of that policy.

The RABC’s comments were supportive of this and made the point very plainly when it said “Rapid changes of fundamental policy, as is the case here, undermine the regulatory stability. The policy originally excluded the fixed satellite usage in urban areas, then two years later changed it to permit it to be used in urban areas after coordination with the FS, and is now considering expelling the FS altogether. The enunciated policy

¹ Fixed Service Providers, Response to DGTP-003-08, and Consultation Paper on the Possible Use of the Extended-KU Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services, April 17, 2009, page5.

² SaskTel response to DGTP-003-08, Consultation Paper on the Possible Use of the Extended-KU Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services, April 17, 2009, page 5.

gave the satellite industry ample time to develop spectrum outside the Ku band to meet its future needs. If, in fact they have not done so is no reason to open up a new, albeit limited policy review, to the detriment of the FS industry.”³ SaskTel made the same observation where it states in its comments that “Network Operators require regulatory stability to properly plan network deployments in response to expected rapid expansion of 3G and 4G networks. The status quo for this band should be maintained while alternatives are being explored.”⁴ This very important concern was also expressed by TeraGo in the following terms “Detailed Spectrum policy reviews conducted by the Department are intended to provide a stable regulatory environment in Canada. These policies allow FS operators (like TeraGo) and equipment vendors to establish commercial relationships and make significant investments in networks and equipment design. The proposed changes set out in the Consultation undermine that regulatory and commercial stability.”⁵

Rogers reminded the Department that “It is important to note that the Department established this policy, in part, because of the fact that the 11 GHz band was identified in two previous proceedings as being the possible home for fixed service microwave backhaul systems that would be displaced in the 2 GHz band. The Department should not now modify its policy such that some fixed service systems will potentially need to be displaced once again.”⁶ Moreover the FSP in its comments made the point that “Furthermore, the review “was intended as a long-term planning exercise, taking into account the requirements of both Satellite and terrestrial services” and this purpose is undermined by frequent reviews of the policy. In the present instance, clearly, the review made provisions for future FS growth in the extended Ku bands and the future FSS and broadcast satellite service (BSS) growth in the exclusive Ku band and Ka bands, 17/24, 18/28 and 19/30 GHz bands.”⁷

³ RABC response to DGTP-003-08, Consultation Paper on the Possible Use of the Extended-KU Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services, April 17, 2009, page 4.

⁴ SaskTel response, Op. Cit., page 4.

⁵ TeraGo response to DGTP-003-08, Consultation Paper on the Possible Use of the Extended-KU Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services, April 17, 2009, page 2.

⁶ Rogers response

⁷ FSP response, Op. Cit., page 3

The FSP also outlined manufacturers' R&D concerns when it said "Manufacturers base the efficient design of their radio equipment on the specific characteristics of the spectrum allocated and commit developmental resources on the basis of the regulatory certainty provided by Industry Canada's spectrum policies."⁸ In this regard, the significant and ad hoc nature of the proposal in the Consultation Paper would be inconsistent with the objectives of Canadian Telecommunications Policy, which require, in part, that the Department "facilitate the orderly development throughout Canada of a telecommunications system that serves to safeguard, enrich and strengthen the social and economic fabric of Canada and its regions" (Emphasis added).⁹

- The broadcasting satellite industry has already been allocated a large amount of spectrum. In the BSS Ku band, it has eight orbital locations each having 500 MHz with both polarizations; it also has access to the 17.7-18.3 GHz BSS band, available at several orbital locations. Lastly, it has access to transponders in the conventional FSS bands, 11.7-12.2 GHz and several bands in the 17.7-20.2 GHz bands.

Indeed in our comments, the FSP outlined the recent activity to broaden the choice and capacity for both FSS and BSS where we state the following in this regard: "On the FSS side, there are alternatives to the Ku band for DTH broadcasting services, namely the use of Ka bands 17.3-17.8 GHz and 18.3-19.3 GHz for which satellite technology is available as evidenced by the number of FSS applicants for licences in the U.S. Furthermore in 2006 a Ka-FSS licence was awarded to Telesat at 118.7 WL and Ciel was recently awarded 6 new Approvals in Principle by Industry Canada to develop spectrum in the orbital locations listed below: ... It is clear therefore that Canada has ample resources for broadcasting satellite services, including 500 MHz of spectrum, both polarizations, at each of six orbital locations that can be used in combinations to cover all Canada or create regional beams. Each of the beams can support 32 broadcasting FM TV channels. We submit that these allocations should be exhausted before other spectrum is designated for FSS DTH."¹⁰

TeraGo made the same point where it states "TeraGo submits that alternative spectrum bands are available to FSS operators. In addition, alternative opportunities exist for FSS operators. An

⁸ FSP, *ibid*, page 1.

⁹ *Telecommunications Act*, Section 7 (a).

¹⁰ FSP, *ibid*, page 6.

example of this includes the award to Ciel, a Canadian satellite service provider, of 6 new Approvals in Principle by Industry Canada to develop spectrum at several orbital locations. Ciel is currently seeking interest from customers interested in utilizing any of its satellite capacity through a Call for Interest.”¹¹ SaskTel made the FS community’s concerns very plain when it states that “There are other spectrum alternatives available for DTH, namely the 17 GHz Broadcasting Satellite Service (BSS) band (17.3-17.8 GHz). Use of the 17 GHz BSS band better aligns with the FCC and ITU directions on satellite broadcast services. SaskTel notes that Ciel Satellite Group is seeing customers interested in utilizing any of its satellite capacity through a Call for Interest, which includes 17 GHz BSS capacity at 103 W and 107.3 W. We also note Telesat’s recent application for the 17 GHz BSS licence at 111.1 W showing plans to launch a new 17 GHz BSS satellite service for service in 2012.”¹²

The FSP group has read with interest the various comments filed by the satellite broadcasting industry and found the following themes, which we discuss below on a point by point basis.

- 1) There is an immediate and urgent demand for BSS channels, especially to meet Canadian broadcasting policy objectives.

The FSP submit that the Department should be very skeptical that suddenly there is now an enormous pent up demand for broadcasting channels which were not foreseen at the time of the policy review. In October 2004 it was explicitly acknowledged that there was no requirement for ubiquitous deployment of earth stations in the extended Ku band. At the time it was a significant enough development that footnote C16A was deleted, thereby relieving the requirement for earth stations to be located in remote areas. The overall theme at the time was that the earth stations could be readily coordinated and that ubiquitous usage was not envisaged. The deletion of C16A also deleted the requirement for large earth stations, however, this is to be construed more as a by-product rather than as a burgeoning demand for direct to home services. Therefore, we submit that subsequent Departmental informal inquiries and calls for orbital license applications, have led to an opportunistic reaching out for spectrum to shore up future capacity, at the expense of the FS. Furthermore, we submit that the availability of six orbital positions for prime Ku band BSS spectrum representing over 150 TV channels should be fully exploited before spectrum is denied to other planned uses. The satellite broadcasting interests have also laid claim to the spectrum on

¹¹ TeraGo response, Op. Cit., page 2.

¹² SaskTel response, Op. Cit., page 3.

the grounds of providing satellite relay distribution services. We recognize the legitimacy of this use within the current spectrum policy since it is not a service intended for direct reception by general public. As such, it falls within the framework of coordination on a first come first served basis.

- 2) Ku band technology is available now, but Ka band is years away.

The FSP have already mentioned that the Ku band technology is mature and available, but for both the FSS and the FS. For the applications envisaged, namely backhaul, this band strikes the best balance of medium range hops and small antennas. It is envisaged that, with the current and expected enormous growth of 3G and 4G broadband services, wireless carriers will continue to add cell sites and transport capacity to support bandwidth-intensive services. This traffic will need to be transported back to the carriers' mobile switching centers. Any such transport links that are located close to metropolitan areas require small antennas as a result of aesthetic concerns. Lower bands can support longer hops, but the larger antennas associated with these bands make it impractical for carriers to use these bands in metropolitan areas. By setting aside the extended Ku band for FS use, albeit on a shared basis, SP3-30 made provision for this kind of future growth. Allowing DTH in this band would negate this kind of forward planning. As for FSS developments, we concede that it is a relatively mature technology. However, SP3-30 was designed to stimulate the satellite industry to undertake the necessary research and development so as to be able to use higher bands when required. The fact that FSS DTH proponents have not done so is no reason to alter the Department's policy and to deny other users the spectrum that they require to support their services. SaskTel made much the same point where it states that "Although the 17 GHz BSS band has not yet been developed there is keen interest in utilizing this spectrum for DTH services, and the 17 GHz BSS band will be the spectrum of choice for future DTH services. Any use of the Extended-Ku band for DTH will only be a short term solution to address interim capacity issues which will not be used over the long term for DTH. SaskTel does not feel that forcing FS users to be displaced from the Extended –Ku band to support interim DTH service is a fair solution."¹³

With respect to the assertions in the comments filed by Telesat to the effect that the extended Ku band is the only near-term solution for satisfying Star Choice's DTH capacity requirements, the FSP group notes that Telesat's position is at odds with its previously stated position regarding this issue. The FSP group would note in this regard

¹³ SaskTel Response, Op. Cit., page 3.

that, on November 15, 2006, Telesat responded to Canada Gazette Notice DGRB-001-06. In its response, Telesat made the following statements:

“Telesat is pleased to provide the following Canadian Satellite Capacity and Services Plan for its proposed hybrid (Ka-band and 17 GHz BSS) satellite, KA/BSS1, at the 118.7°WL orbital location.”

“Telesat is pleased with the understandings in principle for capacity it has with Barrett and WildBlue and the confidence and support Star Choice has expressed in Telesat as they develop their Ka-band requirements.”

“This demonstrated support is an affirmation of the successful working relationship established in being the first to bring Ka-band services to the Canadian market and the confidence that Telesat is the only satellite operator with a comprehensive Ka-band strategy and the means to execute it.”

“Specifically one of Telesat’s largest customers, Star Choice, has confirmed its interest in Ka-band capacity and its exclusive support for Telesat’s Ka-band application at the 118.7°WL position.”

“The satellite will be equipped with 124 spot beams; 46 of those beams will serve Canada.”

“The KA/BSS1 satellite will be in service at the 118.7°WL position by 2012.”

This Gazette Notice response by Telesat a little over 2 years ago contradicts Telesat’s current position in a number of ways, but particularly troubling is their current assertion that Ka –band satellite is too immature and expensive to implement. This was not Telesat’s position when it responded to the Gazette Notice referenced above and the Department should view their current position with much skepticism.

It is also noteworthy that many operators (including the Europeans that Telesat has held up as example) are now launching Ka-band satellites.

- 3) The use of the extended Ku band would avoid the need for additional dishes on customer premises.

The chief basis of this assertion is that the use of different bands could give rise to the need for multiple antennas at customer premises. However, solutions to this concern already exist. The use of higher frequencies would not require larger antennas. Provided the satellites were collocated with the existing Ku band satellite, the same dish should be able to receive both extended Ku and Ka band signals and processed accordingly. In addition, since the Ku band satellites belong to the same entity, shuffling traffic amongst extended Ku band and conventional Ku band transponders should be possible. In this way, the extended Ku band could be used for satellite point to point services and the conventional Ku band could be used to fulfill the demand for DTH services.

- 4) The DTH proponents need the entire extended Ku band not only to provide for DTH TV programming but also to provide satellite relay distribution undertakings with channels.

The FS services may be compatible with the satellite relay services through coordination, but not DTH. However, it is questionable if the entire band could be used for the purpose, giving rise to the issue as to whether it would not be more cost effective to provide the service in the existing transponders in the conventional Ku band.

- 5) The FS users can readily be relocated to other bands.

Telesat has claimed that transferring the FS operations already existing in the extended Ku band to other bands is relatively simple. As mentioned in the Fixed Service Provider's brief, this is not the case. The existing FS links are optimized for the propagation conditions of the band and unless the transfer is within the Ku band, different link distances may be necessary and additional tower sites may be required. Even a re-location within the extended Ku band must be within a limited range of frequencies determined by the antenna coupling units, waveguide resonant frequencies and other hardware. Furthermore, it would be necessary to re-coordinate the new frequencies among the users.

As a part of its submission, Telesat included a report by Lemay-Yates that Telesat funded, entitled "Extended-Ku Band: Options for Fixed Service Licensees. Not surprisingly the report suggested that there were many bands wherein the FS could find a new home. What was not included in either the main Telesat response or the attached Lemay-Yates report was any mention of economics. Lemay-Yates came closest when they said "Any change to an 11 GHz installation would require an engineered solution. It is not the purpose of this

Report to re-engineer the 11 GHz links currently in service or to suggest technical solutions for specific sites or links.”¹⁴ Lemay-Yates goes on to state that “Detailed engineering studies would be required to confirm which of the options would be the best choice in any specific situation. The analyses presented in this report do not supplant the normal technical studies and coordination activities that would be required by licensees prior to changing frequency assignments or applying for licences in other bands. In particular before making any change to licensed systems the licensee would have to perform technical and coordination studies to ensure lack of interference with other radio licensees within the relevant coordination zones.”¹⁵ What is being said here in the interest of engineering ethics is that there is a very real cost to the FS incumbents in being displaced, a cost that Telesat blithely feels should be borne by the FS for the greater benefit of the FSS proponents. Ciel, in its one-page letter of support for Telesat’s gambit, also passes on the issue of costs where it states “... and that these existing users will have ample opportunity to migrate to viable alternatives over the three year time horizon associated with the deployment of a new satellite.”¹⁶ What both Ciel and Telesat conveniently ignore is the useful economic life of a FS system, which is at least 12 years. In this context the FSP group is disappointed that Telesat chose to file, in confidence, its Wide-beam DTH Satellite Cost Comparison for xKu, RDBS and Ka Bands and its Comparative Link Designs (Appendices 4 & 5). As the Telesat submission is replete with references to the FS communities’ costs and ease of shutting down economically viable systems, it would have been helpful for the FSP to be able to comment on the economic challenges possibly facing Telesat as it tries to recover from not pursuing the Ka band with as much vigor which perhaps might have avoided any present crisis it feels it is facing.

In any event there is a very real cost, as recognized by Lemay-Yates, to the FS community in being prematurely and unnecessarily displaced by Telesat’s request. TeraGo said “The negative consequences of implementing the proposals set out in the Consultation far outweigh the benefits. The proposal to designate the extended Ku band for exclusive satellite use would represent a major financial hardship for FS operators like TeraGo. TeraGo has incurred significant costs in developing and deploying 11 GHz spectrum in its network.”¹⁷ Rogers

¹⁴ Telesat response to DGTP-003-08, Consultation Paper on the Possible Use of the Extended-KU Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services, April 17, 2009, page 5 of the attached Lemay-Yates commissioned report.

¹⁵ Ibid

¹⁶ Ciel Satellite Group response to DGTP-003-08, Consultation Paper on the Possible Use of the Extended-KU Spectrum Bands for Direct-to-Home (DTH) Satellite Broadcasting Services, April 17, 2009, page 1.

¹⁷ TeraGo response, Op. Cit., page 4.

made much the same point when they said “FSS DTH proponents have other options available to them and they should not be permitted to shift the economic burden associated with their future capacity requirements onto the backs of incumbent fixed service users by forcing the displacement of fixed service systems from the extended Ku sub-bands.”¹⁸ SaskTel, in calling for a minimum but limited (only where necessary) 5 year displacement notice period for FS operators should the Department decide to accede to Telesat’s request, states that “The cost of link migration is more than the capital cost of the affected FS radio equipment. As noted above, non-capital costs would also be incurred by FS operators, including costs related to network planning, link engineering, civil works, network downtime, and licensing fees. These costs are significant, and the transition of these FS systems out of the extended-Ku bands would provide no benefit or return on investment for the affected operators, only an increased cost and reduced options for future network design activities.”¹⁹

6) Soft segmentation should solve the problem.

Telesat has proposed a soft segmentation regime in which the current allotment plan would be designated primary for the FS usage and the extended Ku band would be designated primary for FSS usage. The FSP group is firmly opposed to this for the following reasons:

- The proposal reduces by more than half the spectrum available and ready for use as a backhaul band at a time the terrestrial mobile operators are building out their 3G and 4G networks and need more than ever a secure supply of backhaul spectrum to support these bandwidth-intensive services. Moreover, the presence of feeder link stations for low earth orbital satellites introduces coordination difficulties in the vicinity of the feeder-links. The number and locations of these stations would need to be limited.
- Designating the extended Ku band for primary FSS usage goes beyond simply allowing DTH in the band. It completely denies the FS any capacity, even in situations where the two services could co-exist. Where the FSS usage is not DTH, sharing with the FS is possible through coordination. If DTH were permitted in a limited number of channels, then the remaining channels could be used for the FS.

In conclusion, the members of the FSP group remain firmly opposed to the prospect of re-designating the extended Ku band for exclusive use

¹⁸ Rogers response, Op. Cit., page 7, paragraph 20.

¹⁹ SaskTel response, Op. Cit., page 5.

by the FSS, especially given the recent issuance of SP 3-30 by the Department. In our comments, we reminded the Department that “First, the Fixed Service Providers note that “near term” is not immediate. The DTH proponents have indicated that they require additional capacity no sooner than 3 years from now. Extensive analyses show that the Extended-Ku band will not be the only viable option for the delivery of new DTH broadcasting services within that timeframe. Use of the Extended-Ku bands would merely be the least cost option for DTH proponents. While the DTH proponents’ proposal may be an efficient way to upgrade their residential DTH equipment, it would do so simply by shifting the economic burden on to the backs of the Fixed Service Providers and would provide no corresponding benefit to the Fixed Service Providers. This would be entirely unjustified and unreasonable.”²⁰ TeraGo made a similar point where it states that “The negative consequences of implementing the proposals set out in the Consultation far outweigh the benefits. The proposal to designate the extended-Ku band for exclusive satellite use would represent a major financial hardship for FS operators like TeraGo. TeraGo has incurred significant costs in developing and deploying 11 GHz spectrum in its network. This spectrum remains the only viable band which supports favourable rain propagation for “long haul hops”, allowing TeraGo to provide broadband telecommunications services to Canadian businesses (including businesses in underserved Canadian communities).”²¹

Rogers in its response made similar points and reminded the Department that this is not the only prime Fixed Service band facing an extensive carve-out: “Rogers is concerned with the proposed displacement of fixed service microwave backhaul systems from the extended-Ku sub-bands at the same time that the Department is also proposing to limit the use of portions of the 15 GHz band by fixed service microwave backhaul systems. These bands are required for the provision of mid-range backhaul links and limiting the use of fixed services in these bands will create a void in the options available to fixed service users.”²² SaskTel had similar views that it states in the following terms: “The Department has already made provisions for the orderly growth in demand for DTH capacity by making provisions for more spectrum in higher bands. Given this, we believe that the Extended-Ku band is not the only viable option for the delivery of new DTH broadcasting services. In particular the BSS bands offer a viable alternative. The availability of technology to make use of these bands is demonstrated by the fact that several FSS operators have applied for licences. While the proposal supported by the FSS interests is perhaps an efficient way to upgrade viewer’s equipment and it certainly the least

²⁰ FSP response, Op. Cit., page 12.

²¹ TeraGo response, Op. Cit., page 4.

²² Rogers response, Op. Cit., page 12.

costly option for the satellite services provider, it only achieves this distinction by shifting the economic burden to the current FS users.”²³

The FSP group in its comments respectfully reminded the Department that “It is incumbent upon the Department to require a rigorous demonstration of an immediate and urgent demand by Canadians that was not anticipated at the time of the policy review. Furthermore, the DTH proponents have not demonstrated that all technology options have been exhausted in an effort to expand capacity on some or all of their existing conventional Ku-band frequencies. Technologies such as MPEG4 compression or improved modulation with 8PSK will increase capacity.”²⁴ As noted above, Telesat’s filing of material related to cost comparison and link design in confidence has made it impossible for the FSP group to test the validity of Telesat’s analysis. In our view therefore, Telesat’s request does not meet the test of rigorous demonstration.

For all the reasons outlined in this submission, the FSP group respectfully recommends that the Department reject the proposals contained in the Consultation paper.

²³ SaskTel response, Op. Cit., page 7.

²⁴ FSP response, Op. Cit., page 13.