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September 7, 2001

BY HAND DELIVERY

Magalie Roman Salas
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

Re: ***Ex Parte Communication***
Establishment of Rules and Policies for the Satellite Digital Audio Radio
Service in the 2310-2360 MHz Band, IB Docket No. 95-91
XM Radio Request for STA, File No. SAT-STA-20010712-00063
Sirius Request for STA, File No. SAT-STA-20010724-00064

Dear Ms. Salas:

In this letter, AT&T Wireless Services, Inc. ("AWS") responds to the technical white paper submitted by XM Radio, Inc. on the potential for interference from high power repeaters in the satellite Digital Audio Radio Service ("SDARS") to receivers in the Wireless Communications Service ("WCS").¹ In addition, AWS takes this opportunity to correct several misstatements contained in an *ex parte* filing by XM that purports to summarize the positions of the parties at a meeting on August 30, 2001.²

Although AWS received a copy of the white paper only late last week and has not yet had sufficient time to complete its review, there are certain flaws in the presentation that are immediately apparent to which AWS wishes to draw the Commission's attention. Briefly summarized, these flaws are as follows:

¹ "Potential Blanketing Interference from DARS Repeaters to WCS Receivers," White Paper submitted by XM Radio attached to Letter from Bruce D. Jacobs to Magalie Roman Salas, dated August 29, 2001 ("XM White Paper").

² Letter from Bruce D. Jacobs to Magalie Roman Salas, dated September 5, 2001 ("XM Letter").

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- XM offers the use of automatic gain control (“AGC”) technology as a way to harden WCS receivers.³ While AGC would desensitize WCS receivers to overload from high power SDARS repeaters, it would also desensitize those receivers to the desired signals in the WCS band. As XM’s own white paper shows, there is a “dB for dB” loss of sensitivity,⁴ meaning that every gain in protection against blanketing interference from SDARS repeaters is offset by a corresponding loss in the ability of the receiver to operate in its own band. As a result, the use of AGC would decrease the range of WCS equipment and necessitate the deployment of many additional base stations in order to compensate for the smaller cell size.
- It is possible to reduce the size of the exclusion zones created by a given high power SDARS repeater by adding filters to WCS receivers in the base stations and customer receiver units (“RUs”). However, the issue is one of cost. The filters that XM proposes for the base station may be feasible, but would add not only the expense of the filter itself but also the cost of the modification of AWS’ current tower top amplifier unit, and would result in a reduction of its base station coverage area. The facts are even worse with respect to the RUs, since the cost of the filter for the RU application is similar to the cost of the RU itself. In addition, because the RU employs receiver diversity, it would require *two* such filters. The physical size and weight of these filters is also a major concern from an installation and customer acceptance point of view.
- The deployment scenario discussed in the white paper is unrealistic. It assumes that the SDARS repeater and WCS base station are collocated and that the former is positioned 60 feet above the latter.⁵ In AWS’ experience, it is only in very rare cases where tower sites will accommodate such a large vertical separation. Moreover, since AWS will deploy far more base stations than XM and Sirius will deploy repeaters, even if there were a conscious effort to collocate as much as possible, the vast majority of AWS’ base stations would have to operate from other locations – and unless XM and Sirius are collocated, there would still likely be a nearby repeater to deal with. Since the collocation and vertical separation assumptions are invalid, XM’s analysis greatly understates the resulting potential for interference.

³ XM White Paper at 2.

⁴ *Id.* at 6-7.

⁵ *Id.* at 8. AWS also notes that XM’s analysis conveniently shifts between assessing the impact upon BellSouth’s equipment or AWS’ equipment, depending upon which has a greater resistance level for purposes of the particular analysis at hand.

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- XM's assumption that AWS' base station signals will overload its own RUs is entirely erroneous.⁶ The RU incorporates both AGC and power control technology with respect to its own desired signal to prevent this problem. The AGC ensures that signals are received at the RU with sufficient power to be decoded without overpowering the receiver. RU transmit power control is used in a similar manner to ensure that signals received at the base station are within its operating range. These two features ensure proper system operation for RUs located anywhere within the coverage area of a base station.
- XM argues that 40 kW repeater networks will provide a smaller overall WCS exclusion area than an equivalent 2 kW network. XM begins by providing a detailed description of the need to control delay spread in its repeater network, which it is able to achieve through the use of high gain directional antennas. However, when XM provides examples of high power and standard power repeater network strategies, it ignores this "key RF network design parameter."⁷ Instead, it uses networks of omni repeaters with overlapping coverage areas. XM did not show the predicted or the desired coverage area for either example, so it is not possible to determine whether the networks provide equivalent performance. In addition, there are unexplained peculiarities in the examples provided by XM that call the analysis further into question. For example, in Los Angeles the exclusion radius for each 2 kW repeaters appears to be *larger* than the exclusion radius for each of the original high power repeaters. And in the case of Indianapolis, it is not clear why the 2 kW repeaters are placed so close together that the -45 dBm contours are nearly touching for a system of SDARS receivers with a sensitivity of at least - 80 dBm.

In addition, the XM Letter includes a number of inaccuracies that cannot remain in the record unchallenged. First and foremost, contrary to XM's mischaracterization, it was XM and not AWS that asserted that AWS' RUs "would not be better off if the DARS licensees deployed more lower power repeaters instead of fewer higher power repeaters."⁸ While blanketing interference from SDARS repeaters certainly poses the largest immediate problem with respect to AWS' WCS base stations, it is not true that AWS is "concerned only with the effect of high-power repeaters on its WCS base stations."⁹ RUs also remain a very real concern. AWS' initial deployment strategy is

⁶ *Id.* at 3.

⁷ *Id.* at 10.

⁸ XM Letter at 2.

⁹ *Id.*

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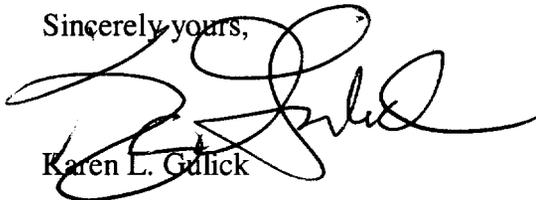
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focused on the residential market consisting primarily of single-family homes. However, there is every reason to believe that the lifeline, local exchange and broadband Internet services that AWS is offering will be made available to customers in apartments, condominiums, and other multiple dwelling units. Thus, the problem is *not* limited to base stations, but directly affects customer receiver units as well. Moreover, AWS reminded those present that in making spectrum management decisions, the Commission should not focus narrowly on a particular deployment strategy by a particular company at a particular point in time – especially early in the development of a licensed service such as WCS that was specifically intended to allow diverse and flexible uses.

Second, while it is literally true that “with sufficient ‘time and money’ [WCS licensees] could improve the susceptibility of their base stations” to SDARS interference,¹⁰ the WCS licensees clearly indicated their view that the “time and money” that would actually be involved could be prohibitively expensive.

Third, XM’s assertion that the WCS licensees “did not present any reasons why they would not be able to achieve the same ability to operate in the presence of high-power repeaters as XM Radio and Sirius have been able to achieve” is outright false. The WCS licensees reiterated the findings of the technical submissions they have made in the SDARS rulemaking proceeding and in response to the requests for special temporary authorization filed by XM and Sirius, and a representative of a WCS equipment maker spoke at length about the problems of equipment design presented by SDARS brute force overload – especially in the context of a two-way WCS service as opposed to a one-way SDARS service.

Sincerely yours,



Karen L. Gallick

cc: Don Abelson
Tom Sugrue
Ron Netro
Ron Repasi
Bruce Franca
Bruce Jacobs
Carl Frank