

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of )  
 )  
*Review of Part 15 and Other Parts* ) *ET Docket No. 01-278*  
*of the Commission's Rules* )  
 )

**Ex Parte Comments of Apple Computer, Inc.**

In a pattern that now appears to be a habit, XM Radio Inc. and Sirius Satellite Radio Inc. (“SDARS providers”) are attempting to transform this docket into a proceeding about their alleged right to use the spectrum in which they operate free from *any* extraneous RF energy.<sup>1</sup> Apple Computer, Inc., (“Apple”) strongly encourages the Commission to dismiss their comments as wholly non-responsive to the issues under consideration.<sup>2</sup>

The Commission should also explicitly reject the reversal of long-standing spectrum management policies that the SDARS providers advocate. Apple believes that adoption of the their far-reaching proposals would effectively curtail future development of highly valued, innovative and cost-effective Part 15 devices. It would certainly kill the nascent revolution in wireless networking. And, perhaps most importantly, it would dramatically alter the spectrum landscape in such a way as to undermine effective and efficient sharing of the spectrum. The Commission must not reward such a self-serving and restrictive view of spectrum use – a view

---

<sup>1</sup> Sirius and XM have made identical arguments in ET Docket No. 96-48, addressing RF lighting, and ET Docket No. 98-153, addressing ultra-wideband technologies.

<sup>2</sup> Comments of Sirius Satellite Radio Inc. (filed February 12, 2002); Comments of XM Radio Inc. (filed February 12, 2002); Reply Comments of Sirius Satellite Radio Inc. (filed March 12, 2002); Reply Comments of XM Radio Inc. (filed March 12, 2002).

Commissioner Martin has criticized as embracing “a ‘fiefdom’ mentality, with spectrum users jealously guarding their spectrum turf.”<sup>3</sup>

Finally, it must be said that the SDARS licensees’ analysis of potential interference – what little they offer – is simply wrong and therefore provides no basis for such a dramatic reversal of Commission spectrum policy. Neither licensee provides data that would allow for independent analysis and verification of their claims. Further, they overlook at least two factors that would greatly affect any analysis of potential future interference: differences in SDARS and Part 15 deployment, and the role of their high power terrestrial broadcast networks in their service budgets.

Apple files these *ex parte* comments to prevent the damage that would be caused by acquiescence in the SDARS licensees’ views, to reveal their policy implications, and to expose their extremely modest and erroneous technical analysis.

#### **I. Apple’s Interest in the Part 15 Rules**

Apple is a leading developer and manufacturer of computer equipment, peripherals and networking systems. In addition to its well-known computers (iBook, iMac and PowerMac4), Apple produces cost effective broadband wireless connectivity and networking solutions pursuant to Part 15 of the Commission’s rules. One example is the Apple AirPort, a product based on 802.11b technology that networks multiple users without cabling and provides broadband high-speed Internet connectivity as well. Accordingly, Apple has a strong interest in the Commission’s rules governing the operation of Part 15 devices.

---

<sup>3</sup> Remarks by Commissioner Kevin J. Martin to the FCBA Policy Summit & CLE, *U.S. Spectrum Policy: Convergence or Co-Existence?*, March 5, 2002 (as prepared).

## II. The SDARS Proposals

The SDARS providers assert that their recently introduced receivers are susceptible to previously unanticipated out-of-band interference and, accordingly, seek a drastic reduction in the Parts 15, 18 and 95 out-of-band emissions limits.<sup>4</sup> Specifically, Sirius represents that the Commission must reduce the Part 15 and Part 18 emissions limits into the SDARS band by 35 dB.<sup>5</sup> XM also would include the family radio service operating under Part 95..<sup>6</sup>

Simply stated, the SDARS operators allege that the future “proliferation” (*i.e.*, success) of Part 15 devices will interfere with their receivers. Of course, the feared devices (primarily wireless local area networks) were and continue to be designed in accord with technical and operational requirements in effect long before the inception and design of satellite radio service. Nonetheless, the SDARS licensees argue that the Commission must protect them against the public demand for services provided over Part 15 devices by virtually prohibiting out-of-band emissions.<sup>7</sup> As one commenter aptly observed: “Sirius/XM has asked the agency to address a problem that does not exist in a proceeding where the issue has not been raised.”<sup>8</sup>

---

<sup>4</sup> For present purposes, Apple confines its comments to issues affecting Part 15.

<sup>5</sup> Sirius Comments at 2. The Commission’s rules prohibit intentional emissions by Part 15 devices into the 2320-2345 MHz band and limit out-of-band emissions to 500  $\mu\text{V}/\text{m}$  at 3 meters. 47 C.F.R. § 15.209(a). The SDARS providers would cap out-of-band emissions at a mere 8.6  $\mu\text{V}/\text{m}$  at 3 meters, an effective reduction of 35 dB. In addition, the SDARS proposal addresses all Part 15 and 18 devices in the aggregate, whereas the Commission’s rules address the emissions of each authorized device. It is unclear how the Commission could possibly enforce an aggregate limit, as the FCC has no practical control over the placement and use of Part 15 devices by the end-user. Part 15 devices frequently are intended to be portable, regardless of whether they are stationary or mobile in operation.

<sup>6</sup> In a variant, XM proposes that devices operating within vehicles would be capped at 18  $\mu\text{V}/\text{m}$  at 3 meters, measured in a 2 MHz interval. This is a 482  $\mu\text{V}/\text{m}$  reduction from current permissible levels.

<sup>7</sup> *See, e.g.*, Sirius Comments, Attachment at 19.

<sup>8</sup> Written *Ex Parte* Presentation of the License Exempt Alliance at 5 (filed April 18, 2002).

### **III. Sirius's and XM's Proposals Exceed the Scope of this Proceeding**

Before reaching the merits of the SDARS licensees' proposals, Apple must note that the proposals reach far beyond the Commission's notice of proposed rulemaking ("NPRM") in this docket.<sup>9</sup> The Commission has the discretion to consider these proposals, but it cannot legally adopt them as this docket is presently structured. The Administrative Procedures Act fundamentally requires that the public and affected parties be given notice and an opportunity to comment upon regulations the Commission intends to adopt.<sup>10</sup> Such notice must either provide the terms or substance of the proposed rule or, at a minimum, adequately describe the subjects and issues involved.<sup>11</sup>

The NPRM initiating this proceeding raises two discrete issues concerning Part 15 emissions limits: (1) it proposes to ease emissions limits in the bands above 38.6 GHz, and (2) it asks whether radar detectors tuning above 960 MHz should be required to comply with Part 15 emissions limits. The SDARS proposals, by contrast, (1) advocate a radical reduction in permitted out-of-band emission limits involving not only Part 15 devices, but also devices operating under Parts 18 and 95, and (2) address emissions in the 2.4 GHz band.

The commonality between the NPRM and the SDARS proposals is minimal, deriving primarily from the NPRM's caption, "Review of Part 15 of the Commission's Rules." Even Sirius concedes the tenuous connection, acknowledging that to address its proposal the Commission would need to substantially "broaden the scope of this proceeding, or initiate a

---

<sup>9</sup> *Review of Part 15 and Other Parts of the Commission's Rules*, Notice of Proposed Rulemaking, ET Docket No. 01-278, FCC 01-290, 16 FCC Rcd 18205 (rel. October 15, 2001).

<sup>10</sup> 5 U.S.C. §§ 551 *et seq.*

<sup>11</sup> *See* 5 U.S.C. §§ 553(b)(3).

separate proceeding.”<sup>12</sup> For these reasons, this docket is not appropriate for adoption of these proposals, even in the unlikely event the Commission were to decide that they warrant the expenditure of resources necessary for further review.

#### **IV. Sirius and XM Wrongly Assume Entitlement to a Sterile RF Environment**

The SDARS operators’ requests are based on a view of individually licensed services that would excuse a licensee – particularly one that obtained its spectrum license at auction – from even the most rudimentary efforts to minimize the potential for interference to its own system. XM and Sirius would have the Commission allow a licensee to design its system in disregard of both established rules and the existing RF environment, and then later demand that the FCC solve “unanticipated” problems of its own making. Averting the Commission’s attention from the damaging precedent this would create, Sirius’s protestation ludicrously mimics a breach of contract claim: “In reliance on the Commission’s various pronouncements that SDARS should be protected from interference, Sirius and XM built and launched their satellite systems at a cost of over \$3 billion and spent close to \$200 million at auction for the license to operate without harmful interference.”<sup>13</sup>

Sirius bases its claim on Section 15.205, which it describes as “strictly prohibit[ing] Part 15 devices from operating in the 2320-2345 MHz band.”<sup>14</sup> Because of this prohibition, Sirius

---

<sup>12</sup> Sirius Comments at 1; Sirius Reply Comments at 2. Likewise, Sirius admits that the instant proceeding “do[es] not address the overall, cumulative effect of out-of-band emissions by Part 15 and Part 18 devices on licensed users.” Comments at 3.

<sup>13</sup> Sirius Comments, Attachment at 15.

<sup>14</sup> Sirius Comments, Attachment at 21. However, Sirius describes only part of Section 15.205. Section 15.205 identifies restricted bands of operation – primarily bands that host sensitive government or scientific radio frequency operations. Long before SDARS, the 2310-2390 MHz band was used for aeronautical telemetry and flight test operations, and a portion remains dedicated to those uses today. Consequently, the band remains listed as a restricted band of operation. But the designation predates and is entirely independent of the SDARS service.

explains, “when the SDARS systems were designed, harmful interference from Part 15 devices was not anticipated.”<sup>15</sup> Sirius overlooks the fact that even restricted bands are not intended by the Commission to be free of all emissions – a scenario which would necessitate large guard bands between spectrum assignments, with corresponding inefficiencies in spectrum use. Section 15.205 provides that Part 15 devices cannot “*operate*” -- or place their fundamental emissions -- in a restricted band. However, Part 15 devices are expressly permitted to generate out-of-band emissions in restricted bands.<sup>16</sup> Furthermore, the Commission’s rules do not place a cap on the number of Part 15 devices permitted in the field.

Far from being “unanticipated” by the SDARS licensees, the existence and cumulative potential of very low power out-of-band emissions into the 2320-2345 MHz band were well known to the SDARS licensees before they began to design their systems. Sirius’s current assertion of ignorance of the rules should be neither believed nor excused. At the time of its original application, when it was required to demonstrate that it had sufficiently considered the existing noise and interference environment in which it would operate, Sirius represented to the Commission as follows:

Adjacent band interference will be coordinated with applicable WCS operators recognizing that the FCC has set an out-of-band interference requirement on these operators. Noise sources such as microwave ovens and ISM out-of-band radiation *have been analyzed and are tolerable*. Some of these sources, which may be significant in urban core areas, including self-interference, are mitigated by properties of the terrestrial transmitter modulation which is COFDM.<sup>17</sup>

---

<sup>15</sup> *Id.*

<sup>16</sup> Section 15.205(b) specifies that out-of-band, or “spurious”, emissions into restricted bands are governed by Section 15.209. Within the 2310-2390 MHz band, a single Part 15 device is permitted an emission level not to exceed 500  $\mu$ V/m @ 3 meters.

<sup>17</sup> Application of Satellite CD Radio, Inc. to Modify Authorization, file no. SAT-MOD-19981211-00099 (filed December 11, 1998) at A-25 (emphasis added).

*In other words, when the SDARS operators were seeking the Commission's approval to build their systems, there was no problem.* With that approval in their pockets, the SDARS licensees now assert that the Commission must drastically reduce Part 15 out-of-band emissions in order to protect commercial viability of their systems. Such a shell game should not be tolerated.

The SDARS operators also are confused about the meaning of the word “exclusive” in the context of the licensees they were granted. An “exclusive license” conveys the right to be the sole SDARS operator in the spectrum to which it is assigned. It does *not* convey exclusive rights to the spectrum itself.<sup>18</sup> The SDARS licensees’ spectrum rights, like those of all spectrum users, are shaped by decisions of the Commission in implementing its statutory obligations. The Communications Act grants the Commission the authority and the discretion to adopt regulations, consistent with the public interest, convenience and necessity, to govern the interference potential of RF radiators and to prevent interference between authorized stations.<sup>19</sup> Thus the Commission established power and out-of-band emission limits for Part 15 devices, creating a base of certainty for both Part 15 operators and licensed service providers. The technical and operational limits imposed on Part 15 devices represent, in part, a judgment by the Commission about the ability and value of co-existence between individually licensed services and Part 15 devices.<sup>20</sup> For example, when alleging interference, a licensed operator is required to

---

<sup>18</sup> Indeed, the Communications Act expressly limits the rights, terms and conditions of licenses to use the spectrum. Section 301 of the Communications Act states that “[I]t is the purpose of this Act . . . to provide for the use of [channels of radio transmission], but not the ownership thereof, by persons for limited periods of time. . . . [N]o such license shall be construed to create any right, beyond the terms, conditions and periods of the license.” 47 U.S.C. § 301.

<sup>19</sup> 47 U.S.C. §§ 302(a), (f).

<sup>20</sup> In its major revision of Part 15 in 1989, the Commission noted its intent “to strike an equitable balance between the needs of the public for the services provided by non-licensed RF devices and the need to ensure that these devices do not cause harmful interference to licensed radio services.” *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License*, First Report and Order, 4 FCC Rcd 3493, 3494 (1989).

make a threshold showing of “*harmful*” interference, defined as an emission that “seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with this chapter.”<sup>21</sup> This definition recognizes that no spectrum user operates in a zero noise environment, and that each spectrum user must accommodate some level of emissions into its band.

Although compliance with the emissions limits does not insulate a Part 15 device against claims of actual, harmful interference,<sup>22</sup> those limits are sufficiently stringent that the vast majority of licensees find it far more practicable to incorporate those minimal emissions into their noise floor than to petition the Commission for change. The SDARS providers ignore these considerations, choosing instead to argue their “reliance” and the Commission’s “duty” to them as licensees. Such a view of their entitlement disregards not only the Commission’s rules and precedent, but also its broader obligation to manage the spectrum in the public interest. Granting the SDARS providers the relief they request would upend the balance the Commission previously struck and come dangerously close to signaling that licensed services need not make even a modest attempt to minimize their susceptibility to out-of-band emissions from extremely low power Part 15 devices.

---

<sup>21</sup> 47 C.F.R. § 15.3(m).

<sup>22</sup> Section 15.5, “General Conditions of Operation”, provides that “operation [pursuant to this Part] is subject to the conditions that no harmful interference is caused and that interference must be accepted . . . .” 47 C.F.R. § 15.5(b).

**V. The SDARS Providers Offer Paltry Technical Analysis, and No Justification, for Such a Major Departure from FCC Precedent**

Ultimately, the SDARS operators fail to establish that Part 15 devices will interfere with SDARS receivers. Their “technical exhibits” are inadequate to demonstrate that harmful interference will be caused to their satellite signal reception because they provide no analysis or underlying data. In addition, Sirius and XM fail to understand how the likely deployment pattern for 802.11b and Bluetooth devices will minimize interference potential. Finally, even if concerns about interference to the reception of their satellite signals were legitimate, Sirius and XM conveniently ignore the effect of their redundant, high-power terrestrial broadcasting networks upon any potential for interference from Part 15 device.

Sirius’s analysis cannot be relied upon as a basis for modifying any Commission rule. Sirius apparently believes that it is sufficient to state, without reference or derivation, various figures for its systems, such as its edge of coverage signal. And Sirius uses unsubstantiated figures to arrive at a proposed emission limit for Part 15 and Part 18 devices.<sup>23</sup> A more illustrative analysis would include all relevant satellite and receiver parameters necessary for the Commission and interested commenters to independently assess potential out-of-band interference. From the information provided, we simply do not know whether Sirius included factors such as elevation angle to the mobile receiver, diversity gain attributable to Sirius Radio’s satellite diversity implementation, polarization discrimination, or even if the “received power” accounts for mobile receiver antenna gain.

---

<sup>23</sup> Sirius’s use of an edge-of-coverage signal is also telling. Sirius states that this level is based on coverage near the border of the United States. Presumably the satellite signal is diminished along the borders to protect terrestrial services in Canada and Mexico, pursuant to international agreement. Sirius points out that the border areas include highly populated areas such as Boston, New York, Miami, Los Angeles, San Francisco and others. *See* Sirius Comments at note 54. Yet it is in these areas that Sirius and XM rely on their secondary high-power terrestrial broadcast networks.

Meanwhile, XM attempts to camouflage the dearth of evidence by equating radar detectors with all unlicensed devices.<sup>24</sup> Concluding that radar detectors emitting high level radio signals can cause interference to very small aperture satellite terminals (“VSATs”), the Commission recently adopted its proposal to modify section 15.109 governing radiated emissions limits.<sup>25</sup> Notably, though, the Commission’s action merely brought certain radar detectors within the scope of the existing rule – it did not find the existing Part 15 limits to be inadequate, as the SDARS licensees might like one to believe. Previously radar detectors tuning above 960 MHz were not subject to radiated emissions limits. The Commission merely corrected this historical anomaly, subjecting them to precisely the same emissions limits the SDARS licensees would have the Commission find inadequate. What “evidence” XM offers falls far short of justifying a change in the rules. XM offers what its consultant represents to be a “preliminary document” – suggesting further analysis is warranted.<sup>26</sup> And XM considers only one potential interference scenario: the collocation of a Bluetooth device and an SDARS receiver in a vehicle. Though possible, this certainly is not the predominant deployment scenario. Finally the analysis suffers from the deficits identified above: it merely states that an increase in the SDARS band noise floor due to allowable out-of-band emissions will reduce the available SDARS satellite link margin. There is no quantification of either the noise floor or its effect on the available satellite link margin.

As noted above, the SDARS licensees were well aware of the 2.3 GHz RF environment when they filed their applications. Either they did incorporate the parameters of that

---

<sup>24</sup> XM Reply Comments at 4-5.

<sup>25</sup> *Review of Part 15 and Other Parts of the Commission’s Rules*, First Report and Order, ET Docket No. 01-278, FCC 02-211 (released July 19, 2002).

<sup>26</sup> XM Comments at Exhibit A.

environment in the design of their satellite link and the satellite receiver module, or they should have. To act surprised now does not justify a change in Part 15 out-of-band emission limits, nor do the XM Radio and Sirius Radio “analyses” in this proceeding.

**VI. The Deployment of Part 15 Devices is Unlikely to Result in the Aggregate Interference Sirius Radio and XM Radio Predict**

Sirius and XM advertise their service as primarily a mobile service for use in automobiles. Historic and predicted usage models show that wireless LANs operate primarily in businesses, schools and homes. Consequently, the deployment scenarios for SDARS receivers and Part 15 local area networking devices are likely to be vastly different. It is unlikely that the 802.11b and Bluetooth devices, of which the SDARS operators express particular concern, will be deployed in a manner that would result in aggregate interfering signals. Apple simply cannot imagine a deployment scenario where a critical “doomsday” mass of Part 15 devices will cause harmful interference to the SDARS service.<sup>27</sup>

While the SDARS licensees tout the mobile aspects of their service, XM does advertise home use as well. In order to receive the satellite signal, the receiver will require an externally mounted receive antenna oriented toward the satellite. Consequently, there would be a significant amount of wall attenuation of any emissions from Part 15 devices operating within the home. It is also unlikely that a significant number of Part 15 devices will be operating in the home and potentially affecting the outdoor reception of an SDARS satellite signal because a single 802.11b access point would be sufficient to service an entire network of home computers.

---

<sup>27</sup> With regard to the primary area of deployment of SDARS receivers – automobiles – Apple submits that interference from a vehicle whose occupant is using a Part 15 device into a SDARS receiver in another vehicle is unlikely. Unless the vehicles have collided there is likely to a meaningful amount of separation

## **VII. SDARS Networks Will Operate Satisfactorily Regardless of Part 15 Devices**

Even if the deployment of Part 15, Part 18 and other devices could result in the aggregate interference predicted by Sirius and XM, their customers would experience no degradation of service. As mentioned above, the SDARS operators have failed to consider a defining aspect of their systems – that they operate hybrid satellite-terrestrial broadcasting networks. Thus, when they hypothesize an effect on their satellite link margin, they should also consider the effects of their nationwide terrestrial networks. Their dual mode terrestrial/satellite receivers will select the strongest available signal, which in areas covered by the terrestrial broadcasting network will be the terrestrial signal. Coincidentally these predominantly urban areas are precisely those that will experience the highest deployment of 802.11b, Bluetooth and other Part 15 devices.

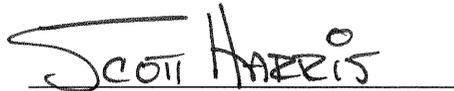
---

between the two devices, and the vehicle itself will provide significant attenuation of the Part 15 device's emissions.

### **VIII. Conclusion**

The Commission must recognize the SDARS requests for what they are—unsubstantiated requests for rule changes that would have far-reaching consequences for the Commission's spectrum management policies. Certainly their requests bear no resemblance to the issues under consideration in this docket and should be dismissed. More importantly, the Commission must reject the invitation to dismantle regulations that have been tremendously successful in facilitating the growth of innovative, low-cost consumer services.

Respectfully submitted,

A handwritten signature in black ink that reads "SCOTT HARRIS". The signature is written in a cursive style with a horizontal line underneath the name.

Scott Blake Harris  
Karen Gulick  
Damon Ladson  
HARRIS, WILTSHIRE & GRANNIS, LLP  
1200 18<sup>th</sup> Street, N.W.  
Washington, D.C. 20036

*Counsel to Apple Computer, Inc.*

July 31, 2002