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FEDERAL COMMUNICATIONS COMMISSION  
SECRETARY

June 9, 2000

**BY HAND DELIVERY**

Magalie R. Salas, Esquire

Secretary

Federal Communications Commission

445 12th Street SW, Room TW-B204

Washington DC 20554

**Re: Amendment of Part 18 of the Commission's Rules to  
Update Regulations for RF Lighting Devices  
ET Docket No. 98-42 — Ex Parte Communication**

Dear Ms. Salas:

This responds to the letter from Terry G. Mahn, counsel for Fusion Lighting, filed in this docket on May 25, 2000 ("Mahn Letter").<sup>1</sup> I am authorized to state that the following entities support this response: 3Com Corporation; Clearwire Technologies, Inc.; Eastman Kodak Company; Intersil Corporation; LinCom Wireless Corporation; Metricom, Inc.; and Symbol Technologies, Inc. -- collectively, the "Part 15 Interests."<sup>2</sup>

**The Fusion Filing is Late**

The Mahn Letter of May 25 reports an *ex parte* presentation that took place fully two weeks earlier, on May 11. The Commission's Rules require written notice "no later than the next business day

<sup>1</sup> We refer to Mr. Mahn's substantive letter of that date. Filed simultaneously was a brief cover letter over a written communication from Daniel Tessler, Fusion Lighting, to Chairman William Kennard, dated May 23, 2000.

<sup>2</sup> The makeup of the Part 15 Interests has changed somewhat over time. Not all of the entities listed here were party to all of the earlier filings attributed to the Part 15 Interests.

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after the presentation."<sup>3</sup> The lapse of time in this case threatens to prejudice other parties, particularly considering the extremely novel issues raised in the presentation.

**Sanction requested.** Pursuant to Section 1.1216, as an appropriate sanction for this unexplained violation, the Part 15 Interests ask the Commission to summarily dismiss, with prejudice, the requests Fusion made in its May 11 presentation and summarized in its May 25 letter.<sup>4</sup>

### Issues in This Proceeding

Because recent Fusion filings have ranged far outside the scope of this proceeding, we provide this brief recapitulation of the original issues.

The proceeding was launched at Fusion's request, to establish rules for RF lights at 2.4 GHz.<sup>5</sup> Among other issues, the Commission invited comment on in-band limits for RF lights.<sup>6</sup> Several entities noted in response that RF lights threaten interference to commercial spread spectrum devices in the band.<sup>7</sup> RF lights are a type of Industrial, Scientific, and Medical (ISM) equipment, currently the only

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<sup>3</sup> 47 C.F.R. Sec. 1.1206(b)(2).

<sup>4</sup> See 47 C.F.R. Sec. 1.1216 (authorizing imposition of sanctions).

<sup>5</sup> The proceeding originally addressed non-Fusion matters as well, but the Commission has since dealt with those separately. RF Lighting Devices, 14 FCC Rcd 9840 (1999).

<sup>6</sup> RF Lighting Devices, 13 FCC Rcd 11307, 11312 at para. 13 (1998) (Notice of Proposed Rule Making). The Notice also considered conducted limits and out-of-band emissions. *Id.*, 13 FCC Rcd at 11310-12.

<sup>7</sup> The installed base of spread spectrum devices in the United States amounts to a \$1.5 billion investment. Examples of commercial applications include wireless LANs and PBXs, retail cash registers and inventory control, airport baggage handling, package delivery, automated meter reading and alarm services, and warehouse picking operations, including catalog sales fulfillment. Hospitals and other health care facilities use spread spectrum devices for patient telemetry, inventory and billing, and bedside checks on medication. Half the transactions on the New York Stock Exchange are mediated by spread spectrum wireless terminals. Wireless Internet access uses spread spectrum for broadband speeds at distances up to 40 km. Telecommunications providers increasingly employ spread spectrum for linking wireless base stations. Millions of consumer devices are in use, including cordless telephones and wireless distribution of in-home entertainment. The market introduction of Bluetooth-equipped products later in 2000 will bring millions more devices to the band every year.

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Commission-regulated service having no in-band limits whatsoever. Spread spectrum equipment tolerates interference well from most types of ISM, but RF lights are a special case. Because they are placed on high ceilings or poles, and are always turned on, excessive radiated emissions from RF lights would be far more disruptive to Part 15 than other ISM emissions. Moreover, RF lights need not radiate at all to function properly. The Part 15 Interests questioned whether unlimited emissions from RF lights are appropriate in an era of spectrum crowding and congestion.<sup>8</sup>

The Part 15 Interests proposed specific in-band limits, and then amended the proposal as our understanding of RF lighting technology improved. Our current proposal, filed almost a year ago, sets out the following average limits:<sup>9</sup>

Sub-Band	Limits
2400-2460 MHz	10 mV/m at 3m
2460-2480 MHz	330 mV/m at 3m
2480-2500 MHz	10 mV/m at 3m

Based on the limited technical information Fusion has made available, the Part 15 Interests believe these values will permit the marketing of Fusion's products, albeit with minor modifications, while keeping interference into Part 15 equipment generally within tolerable levels.<sup>10</sup>

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<sup>8</sup> Part 15 must accept interference from lawfully operating ISM equipment, as discussed below. As a separate matter, however, the Part 15 industry has every right to argue the public interest in new rules that would limit interference into Part 15.

<sup>9</sup> For the detailed rationale behind these figures, see the *ex parte* submission in this docket of Harris Corporation *et al.* (filed June 21, 1999).

<sup>10</sup> The higher emissions across the 20 MHz sub-band centered at 2470 MHz are to accommodate emissions from the magnetrons that power RF lights. The magnetrons used in most microwave ovens operate about 1 percent lower, at 2450 MHz. The small upward shift is necessary because a 2450 MHz emission overlaps two of the three channels used in direct sequence spread spectrum systems, while a 2470 MHz emission occupies only one, with proportionately less disruption of throughput. The Part 15 Interests acknowledge that the move to 2470 MHz magnetrons may initially have cost implications for RF lighting equipment, but these should disappear as production volumes increase.

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Fusion has neither provided a substantive response to this suggestion nor offered a counterproposal. Following a preliminary meeting on January 14, 1999, we have offered several times to meet with Fusion again in an effort to reach a negotiated resolution, but Fusion has consistently refused. We renew the offer now.

### **Fusion's New Position**

The Mahn Letter of May 25 sets out a stunning misapprehension of the Commission's Rules and jurisdiction.

As a preliminary matter, the May 25 letter rests on two incorrect factual assumptions: that RF lights and Part 15 equipment cannot coexist within 300 yards to one-half mile; and that operation of RF lights is certain to cause destructive interference to spread spectrum users on a significant scale.<sup>11</sup> To the contrary, adoption of the proposal outlined above, or perhaps some negotiated variation of it, will permit the two technologies to operate satisfactorily within a few tens of feet.

Second, Fusion assumes that purchasers forced to choose between the two technologies will opt for Part 15 equipment. But the premise is wrong: the imposition of reasonable emissions limits on RF lights will make any such choice unnecessary.

Third, Fusion states that any limitations on its product would violate unspecified "treaty obligations of the United States."<sup>12</sup> This is incorrect, as we explain below.

Fourth, Fusion correctly notes that ISM holds a senior position in the band over Part 15. This gives an ISM product the right to interfere at will with any Part 15 device.<sup>13</sup> A victim Part 15 operator has no recourse at the Commission or anywhere else. Yet even that does not satisfy Fusion, which goes on to make unprecedented additional demands. Fusion assumes users will have to choose between RF lights and spread spectrum systems, and fears they will opt for the latter. In consequence, *Fusion insists the Commission must remove spread spectrum devices from the band, solely to protect the market for RF*

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<sup>11</sup> Mahn Letter at 2.

<sup>12</sup> *Id.*

<sup>13</sup> "Operation of an intentional, unintentional, or incidental radiator [under Part 15] is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by . . . industrial, scientific and medical (ISM) equipment . . ." 47 C.F.R. Sec. 15.5(b).

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*lights*.<sup>14</sup> Fusion also demands that the Commission (a) prohibit spread spectrum devices that cannot tolerate unlimited interference from RF lights (a physical impossibility; see below), (b) develop technical standards to ensure spread spectrum devices can tolerate unlimited interference from RF lights (the same impossibility), and (c) require the spread spectrum industry to pay Fusion to develop an alternative, non-interfering RF lighting technology.<sup>15</sup>

### Response to Fusion

Fusion's demands warrant nothing more than summary denial. Fusion already enjoys the highest level of interference protection the Commission can offer to any user. Fusion is entitled to interfere at will not just with Part 15, but with any other occupant of the band. Fusion equipment is inherently immune to interference (it has no receiver function); but if it were not, Part 15 would be obliged to protect it. Part 15 must accept interference not just from Fusion's products, but from all other users of the band. Any conceivable interference controversy runs automatically in Fusion's favor. ISM/Part 15 is the most lopsided relationship between any two user groups in Commission-regulated spectrum.

But Fusion wants more. It wants spread spectrum relocated from the band -- not because spread spectrum causes interference to Fusion (it cannot), but solely because Fusion fears that users will find spread spectrum equipment more valuable than its own products. This position not only violates basic economics and common sense, but exceeds the Commission's reach under the law. Fusion simply has no right to eliminate competitors for its customers' favor.

Parallel conflicts have arisen in the past. A century ago, for example, when automobiles were new, the laws of many localities required cars to avoid horse-drawn vehicles. In Fusion's terminology, horses were deemed the senior users of the road. They went where they chose, without regard to the cars, while a car had to reach its destination -- if it could -- while still giving the horses a wide berth. Suppose, now, that a carriage manufacturer argues this is not enough. Horses' favored status on the road, it says, requires the government to ban cars altogether, simply because people might prefer them to horses. That is silly, of course, but indistinguishable in principle from Fusion's position here.

Fusion's second and third demands -- that spread spectrum equipment be made immune to interference from RF lights -- fare no better, in either technical or regulatory terms.

Fusion cannot consistently demand both unlimited in-band emissions, and also Part 15 immunity to its interference. As a matter of engineering principle, no receiver can be hardened against unlimited

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<sup>14</sup> Mahn Letter at 3.

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

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interference, any more than a shelf can be made to withstand unlimited weight. If Fusion wants spread spectrum radios that can resist interference from RF lights, it must be willing to cap that interference.

Even then, however, it is absurd to insist that receivers to be able to operate in the face of interference they are already required to accept. A Part 15 user that receives interference from RF lights has three choices: abandon the use of radio, buy a better radio, or replace the lights. That decision is the user's -- not Fusion's, certainly, and not the Commission's. And Fusion, too, has a choice: It can make non-interfering lights (we'll be glad to help), or it can risk cutting into its market by forcing customers to choose between its own products and Part 15 systems. Even senior status in the band does not entitle Fusion to buyers for an inferior product.

In practice, of course, spread spectrum receivers are routinely built to withstand interference, including that from many ISM products. Interference rejection comes both from compliance with the Commission's Rules<sup>16</sup> and from marketplace demands, for customers want radios that work reliably in a wide range of environments. But there is no precedent -- and we can find no authority in the Communications Act -- for imposing Part 15 interference-rejection standards solely to guarantee the market for RF lights. Even if such a measure had any economic rationale, it would lie beyond the Commission's jurisdiction.<sup>17</sup>

The in-band limits proposed by the Part 15 Interests, coupled with the interference rejection inherent in modern spread spectrum systems, should be adequate to assure Fusion's customers that they can operate RF lights in reasonable proximity to their communications equipment. Fusion rejects this solution in part because, it says, application of the proposed limits would violate treaty obligations.<sup>18</sup> In fact, however, while applicable treaty provisions mirror the Commission's Rules in making Part 15

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<sup>16</sup> See 47 C.F.R. Secs. 15.247(a)(1) (receiver bandwidth in frequency hopping systems must match transmitter bandwidth), 15.247(e) (direct sequence systems must show at least 10 dB processing gain).

<sup>17</sup> In ET Docket No. 99-231, several spread spectrum manufacturers asked the Commission to set receiver standards for wide-band frequency hopping equipment that quantify a longstanding obligation in the Rules. See 47 C.F.R. Sec. 15.247(a)(1); letter from Mitchell Lazarus to Magalie Salas, FCC (filed April 10, 2000). Those standards would apply to the products that produce the interference, and are necessary to limit clutter in the band. Here, in contrast, the Fusion-requested standards would apply only to victim equipment, which by law must accept the interference anyway. Fusion seeks only to *increase* noise in the band, and to sell its interference-causing products nonetheless.

<sup>18</sup> Mahn Letter at 2.

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secondary to ISM, they also require national administrations to take affirmative steps to minimize such interference. Far from ruling out the requested in-band limits for ISM, the applicable treaty provisions actually mandate such limits.

Specifically, the same provision in the ITU Radio Regulations that requires radiocommunication devices to accept harmful interference from ISM (No. S5.150) also states that ISM equipment "is subject to the provisions of No. S15.13." That provision in turn states:

Administrations shall take all practicable and necessary steps to ensure that radiation from equipment used for industrial, scientific and medical applications is minimal. . . .<sup>19</sup>

Because the language of No. S15.13 is mandatory ("Administrations *shall* . . ."), the Commission's treaty obligations not only permit it, but require it, to adopt limits that will minimize the radiation, and hence the interference, from Fusion's ISM products.

Fusion's last demand -- that the spread spectrum industry be forced to pay Fusion to develop an alternative, non-interfering RF lighting technology -- is just a manufacturer's pipe dream. Fusion does not even attempt to provide either a rationale or a legal precedent for its position. We note from the *ex parte* correspondence that Commission has appropriately declined to consider this option.<sup>20</sup>

### **Conclusion**

Fusion's *ex parte* letter of May 25 was filed almost two weeks later than is permitted under the rules. The Commission should summarily dismiss its requests.

Fusion wrongly assumes that RF lights and spread spectrum cannot coexist. Fearing that customers forced to choose between them would find spread spectrum more useful, Fusion seeks either to eliminate spread spectrum from the band, or to require that it operate properly in the face of unlimited interference -- an engineering impossibility.

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<sup>19</sup> ITU Radio Regulations No. S15.13., Vol. 1 (Geneva 1998).

<sup>20</sup> Letter from Daniel Tessler, Fusion Lighting, to Chairman William Kennard (dated May 23, 2000) (filed under letter of Terry G. Mahn, May 25, 2000).

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RF lights themselves cannot receive interference from Part 15, or any other source, and are free to interfere with Part 15. Fusion thus seeks limits on spread spectrum receivers only to protect its market, not its products. Fusion's notion that interference priority in the band entitles it to an absolute priority in the marketplace is unsupported by reason, economics, or law.

In any event, the source of Fusions's fears is easily eliminated. Customers need never be put to the choice between spread spectrum equipment and RF lights. The minimal limits on RF lights proposed above, coupled with spread spectrum's already robust interference rejection, will permit both technologies to operate in close proximity. Such limits, moreover, are fully consistent with U.S. treaty obligations.

We urge Fusion to work with the Part 15 Interests in seeking a technically sound, negotiated resolution, rather than continue to burden the Commission with unreasonable demands.

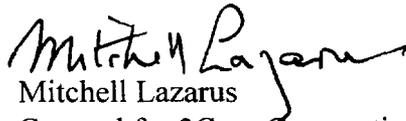
\* \* \* \*

Pursuant to Section 1.1206(b)(1) of the Commission's Rules, I enclose the original and one copy of this letter for inclusion in the above-referenced docket.

Kindly date-stamp and return the extra copy of this letter.

If there are any questions about this filing, please call me at the number above.

Respectfully submitted,



Mitchell Lazarus  
Counsel for 3Com Corporation; Clearwire Technologies, Inc.;  
Intersil Corporation; Lincom Wireless Corporation; and  
Symbol Technologies, Inc.; and filing as an accommodation to  
Eastman Kodak Company and Metricom, Inc.

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