

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D. C. 20554

In the Matter of )  
 )  
Amendment of Parts 2 and 15 of the ) **ET Docket No. 96-8**  
Commission's Rules Regarding Spread )  
Spectrum Transmitters )

RECEIVED  
FEB 10 1996  
COMMUNICATIONS SECTION

**REPLY COMMENTS OF LUCENT TECHNOLOGIES INC.**

Lucent Technologies Inc. ("Lucent") submits the following reply to the comments filed in this proceeding in response to the Commission's Notice of Proposed Rule Making ("NPRM"), released February 5, 1996.

I. **High Gain Antennas Should Be Allowed At 5.8 GHz, But Not At 2.4 GHz.**

Lucent supports the Commission's proposal to allow antenna gains exceeding 6 dBi in the 5.8 GHz band without the dB-for-dB transmitter power output reduction required under the existing rules. As the Commission and several of the parties filing comments note, there are relatively few operations in the 5.8 GHz band, and thus the risk that harmful interference will occur from the use of high-gain antennas in this band is low<sup>1</sup>. The Commission should therefore allow high-gain antennas to operate in this band.

The same cannot be said, however, for the use of high-gain antennas in the 2.4 GHz band. Unlike the 5.8 GHz band, there are a multitude of existing applications in the

<sup>1</sup> See e.g., NPRM at ¶11; Comments of The Wireless Consumer Communications section of the Telecommunications Industry Association ("TIA"); Comments of Cushcraft Corporation; Comments of ADTRAN; and Comments of Apple Computer, Inc. ("Apple")

O+Y

2.4 GHz band that are likely to receive harmful interference if high-gain systems are allowed.

Several parties have filed comments proposing that high gain antennas be allowed at 2.4 GHz without a corresponding power reduction, arguing that the likelihood for interference in this band is low.<sup>2</sup> Lucent disagrees. Allowing high-gain antennas in the 2.4 GHz band without a corresponding power reduction would invite a proliferation of systems with a high effective isotropic radiated power ("EIRP"). This would inevitably result in increased average interference to other devices.

Moreover, a low-power omnidirectional system, such as a wireless local area network ("LAN") or a cordless telephone, which happens to be situated in the main beam of a high-gain system, would clearly suffer more interference from a high-EIRP system than it would from a system operating under the current limit. For the users of those devices, the issue of whether or not the "average" interference level has been raised is irrelevant; the harmful interference that such a user experiences would be painfully apparent.

The *de facto* 6 dBW EIRP limit under the current rules gives systems designers an upper bound on the interference that can be expected from other Part 15 devices. Removing this limit in the 2.4 GHz band could jeopardize existing installations as well as future developments in this area, and would reduce the utility of the band for low-power applications. Mobile applications such as cordless telephones and portable data modems would be particularly affected, because those types of devices cannot take advantage of

---

<sup>2</sup> See e.g., Comments of the part 15 Coalition; Comments of Western Multiplex Corporation ("Western"); and Comments of Cylink Corporation.

antenna directivity to reduce the likelihood of interference which originates from a particular point.<sup>3</sup>

For the reasons discussed above, therefore, Lucent supports the proposal in the NPRM to allow an EIRP exceeding 6 dBW only in the 5.8 GHz band. However, high-gain systems in the 2.4 GHz band should not be allowed.

II. **The Commission Should Clarify That Centralized Coordination of Frequency Hopping Systems is Not Allowed.**

On the issue of allowing limited coordination of frequency hopping systems, the Commission states: "We propose to permit the operation of frequency hopping spread spectrum systems that individually and independently choose and adapt their hopsets to react to the environment in which the system is operating, moving themselves out of the way should another user come on the air in the same band." NPRM at ¶ 43. Lucent supports this proposal, since it would benefit the frequency hopping system as well as other nearby users by preventing mutual interference.

However, the Commission should make clear that this proposal does not allow centralized coordination of frequency hopping systems. In particular, the Commission should clarify that the term "system" in this context comprises a single transmitter-receiver pair engaged in communication, as opposed to multiple transmitter-receiver pairs. This

---

<sup>3</sup> Western argues that if a short-range omnidirectional system is situated so as to suffer interference from a high gain point-to-point ("PTP") system, then the PTP system will suffer worse interference from the other system. See Western's Comments at Attachment I. Lucent disagrees with the conclusion Western draws from its analysis. Western seems to have selected a particular scenario tailored to support its claim, assuming a path loss between the affected receiver of the omnidirectional system and its transmitter that is sufficiently low to allow the system to function in the presence of the interference from the PTP system. Selection of a different, but equally plausible, set of parameters for the calculation would lead to the opposite conclusion; namely, that the PTP system could continue to function adequately while the omnidirectional system would be compromised.

should alleviate any confusion as to what type of coordination the Commission proposes to allow.

In this regard, we note that a number of parties have apparently interpreted the Commission's proposal differently, suggesting various coordination mechanisms that seem to go beyond the bounds of "independent" adaptation. For example, Tadiran Telecommunications, Inc. ("Tadiran") proposes that coordination be allowed for co-located frequency hopping transmitters, provided they use directional antennas to provide isolation. Clearly, this is not the type of coordination the Commission intended to allow by its proposal. In any event, the type of coordination that Tadiran advocates is unnecessary. If there is truly isolation, coordination should not be needed to avoid interference. On the other hand, if the isolation is imperfect, the independent adaptation proposed in the NPRM should allow any interference to be eliminated.

Thus, the Commission should make clear that centralized coordination schemes such as that proposed by Tadiran are neither necessary nor allowed under the Commission's proposal.

### **III. There is no Need to Limit the Number of Co-located Transmitters.**

Several parties have suggested limits on the number of co-located transmitters that should be allowed to coordinate their hopping sequences. Lucent believes that as long as each frequency hopping transmitter independently adapts its hopping sequence, such restrictions are unnecessary. The dynamics of independent adaptation (each hopper will be adapting its hopset in reaction to interference from the other hoppers as well as to interference from other devices), as well as the difficulties of RF power combining and the interactions (e.g., intermodulation products) associated with a large number of co-located

radios, will tend to make large numbers of co-located hoppers impractical. Thus, a limit is not necessary.

**IV. The Commission Should Consider Proposals for Short-Duration Systems on a Case-by-Case Basis. The Rules Should Not be Changed.**

Several parties have proposed a change in the rules to allow short-duration (i.e. low duty-cycle) systems.<sup>4</sup> Although the applications described in those Comments may not pose an interference threat to other users of the band, Lucent believes that it is more appropriate for the Commission to consider such proposals on a case-by-case basis rather than as proposed amendments to the rules. An amendment to the rules for short-duration systems is likely to inadvertently allow unanticipated uses that could result in harmful interference. In addition, it appears there are only a handful of parties interested in pursuing these types of applications at this time. Thus, the Commission should manage novel proposals for systems involving short-duration transmissions through the waiver process which would allow a more thorough and specific assessment of the potential interference threat posed. A broad change in the rules is not warranted at this time.

**V. Section 90.361 of the Rules Should Not Be Amended.**

Teletrac License, Inc. ("Teletrac") proposed that the Commission amend Section 90.361 of the Commission's rules governing Location and Monitoring Systems ("LMS").<sup>5</sup> That section of the rules governs the ability of multilateration LMS licensees to claim harmful interference from Part 15 and 97 operations. Under Teletrac's proposed amendment, multilateration LMS licensees would be allowed to claim harmful interference from Part 15 devices using fewer than 50 hopping channels and operating in any portion of

---

<sup>4</sup> See, Comments of Itron, Inc., Allian Techsystems, Inc. and Master Lock Company.

<sup>5</sup> Comments of Teletrac at 7

the LMS multilateration spectrum, even if those devices meet the safe harbor provisions of the rule.<sup>6</sup>

As a procedural matter, Teletrac's request appears to be outside the scope of this proceeding. The NPRM does not propose any changes to the Part 90 rules, nor does it address the rights, obligations or restrictions of LMS licensees. At a minimum, any consideration by the Commission of Teletrac's proposal would require a separate (or further) public notice and opportunity for public comment.

In any event, there does not appear to be a need to amend Section 90.361 as Teletrac has suggested. The probability that Part 15 devices using a smaller number of hopping channels will interfere with multilateration LMS systems can be offset by a corresponding reduction in the output power limits for such Part 15 devices. For example, the Comments of the Wireless Consumer Communications Section of the Telecommunications Industry Association demonstrate that if the power output limit is proportional to the square of the number of hopping frequencies, the probability of interference from a frequency hopping device using fewer hopping channels will be no worse or better than the probability of interference from Part 15 devices operating in conformance with the current rules.<sup>7</sup> Therefore, the Commission can alleviate Teletrac's concerns about potential interference from Part 15 devices using a smaller number of frequency hopping channels by adopting the appropriate power limitations for such devices such as TIA suggests. There is no need to amend Section 90.361 of the rules.

---

<sup>6</sup> Id.

<sup>7</sup> Comments of TIA at 2-4

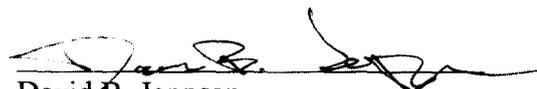
VI. **Reconsideration of Symbol's Rulemaking Petition is Outside the Scope of this Proceeding.**

GEC Plessey Semiconductors ("GEC") filed comments requesting that the Commission reconsider the denial of the Petition for Rulemaking filed by Symbol Technologies, Inc. ("Symbol"). Although the Commission's order denying Symbol's petition was put forth in the same document that contained the NPRM, the Commission's action denying Symbol's petition was not part of the NPRM. It was an independent legal action. This rulemaking proceeding is not the proper forum in which to address the reconsideration of Symbol's petition. See, 47 CFR §1.106. Therefore, Lucent will not comment on the merits of GEC's request. Lucent nonetheless continues to support the Commission's denial of Symbol's petition.

Respectfully submitted,

LUCENT TECHNOLOGIES INC.

  
Richard D. Bleicher  
Senior Attorney  
LUCENT TECHNOLOGIES INC  
219 Mt. Airy Road  
Basking Ridge, NJ 07920  
(908) 953-4930

  
David B. Jeppsen  
Director and Attorney  
Federal Public Affairs  
LUCENT TECHNOLOGIES INC.  
1120 20th Street, N.W., 10th Floor  
Washington, D.C. 20036  
(202) 457-2390

July 19, 1996