

ORIGINAL

DOCKET FILE COPY ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

RECEIVED
DEC 5 - 1997

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY
RM-9189

In the Matter of)
)
SIERRA DIGITAL COMMUNICATIONS, INC.)
)
Petition for Rulemaking to Accommodate)
Point-to-Point Operations in the 24)
GHz Band Under Part 15 of the)
Commission's Rules)

COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED

The American Radio Relay League, Inc., (the League), the national association of amateur radio operators, by counsel and pursuant to 47 C.F.R. §1.405, hereby respectfully submits its comments in response to the captioned Petition for Rulemaking, filed on or about September 29, 1997, by Sierra Digital Communications, Inc. (Sierra).¹ For its comments, the League states as follows:

1. Sierra's Petition seeks an amendment of the Part 15 regulations governing unlicensed intentional radiator devices to permit grants of equipment authorization, and to permit the use of devices for unlicensed, point-to-point microwave transmission facilities in the 24.00-24.25 GHz band. Sierra describes the purpose of these unlicensed facilities as providing "short-range" point-to-point communications. Its proposed configuration incorporates the use of high-gain (33 dBi), ostensibly narrow-beamwidth antennas in fixed, point-to-point operation, at a maximum field strength of 2.5 V/m. In other respects, current Part 15 rules would apply.

¹ The Petition was originally filed September 3, 1997. A replacement draft was submitted September 29, 1997. The Petition appeared on Public Notice Report No. 2238 dated November 5, 1997.

Handwritten initials: OLY
ET

2. Sierra claims that the interference potential of the devices is "negligible", and makes reference, in support of the conclusion, to the transmitter power output of the device as being "less than one milliwatt". It also notes, apparently by way of analogy, that the use of directional, high-gain antennas will reduce interference, as was asserted in connection with spread-spectrum emissions. See *Spread Spectrum Transmitters*, 7 Pike & Fischer Communications Regulation (CR) 534, 541 (1997). With respect to interference to stations in the Amateur and Amateur-Satellite Services, Sierra claims that the highly directional nature of the transmissions causes it to "doubt" the likelihood of harmful interference. However, Sierra also offers to require that its equipment be frequency agile in the field, and that (unlicensed) users must "first" employ frequencies at 24.05-24.25 GHz. They would utilize the 24.00-24.05 GHz band only if all other frequencies are in use or otherwise unavailable. It also notes the obligation of a Part 15 device user to cease operations in the event of interference to authorized services, and thus, Sierra asserts, Amateur and Amateur-Satellite Services are protected adequately on a regulatory basis.

3. In its Petition, Sierra recognizes that the 24.0-24.25 GHz band is currently allocated domestically for Government radiolocation, non-government radiolocation, Earth-exploration satellite services, and the Amateur and Amateur-Satellite Services, and as well for ISM devices.² It is also available for certain unlicensed intentional radiators regulated under Part

² More specifically, the 24.00-24.05 GHz band is allocated on a primary basis to the Amateur and Amateur-Satellite Services. This segment of the 24.00-24.25 GHz band is included in the downlink capabilities of the Phase 3D amateur satellite, the launch schedule of which has been briefly delayed and is anticipated shortly. Use of this satellite will be immensely popular. The use of this band segment, especially for downlink communications, makes interference from fixed point-to-point transmitters such as those envisioned in the Sierra Petition difficult to accommodate. It could not be suggested that there would be no interference from a transmitter operating at 2.5V/m at 3 meters to amateur satellite receivers. The Segment 24.05-24.25 GHz
(continued...)

15. Sierra thus proposes that the Commission's Part 15 rules be changed to allow point-to-point fixed operation in the band subject to certain conditions (Petition, at 2).

4. The problems with the Sierra proposal are several, and are readily obvious. First of all, Sierra proposes an unlicensed series of high-powered microwave transmitters on variable frequencies, presumably to be operated by anyone (including, and probably principally, non-technical persons), with a need for point-to-point microwave communications. This is a complete abandonment of the entire Part 15 unlicensed device concept. Point-to-point microwave communications over short paths such as those proposed by Sierra are better facilitated by the use of existing licensed services such as private, fixed point-to-point microwave facilities now licensed by the Commission under Part 101; at frequencies above 40 GHz;³ by licensed and

² (...continued)

is allocated primarily to Government Radiolocation, and secondarily to the Amateur Service, non-Government radiolocation, and the Earth-Exploration satellite service (active). Furthermore, relative to the 24.00-24.05 GHz segment, Footnote US211 to the table of allocations warns airborne or space users to avoid interference to radioastronomy operations in adjacent bands. The need to protect radioastronomy activities in adjacent bands inevitably creates interference concerns relative to ubiquitous, high-ERP, point-to-point terrestrial operation of Sierra's devices.

³ See, e.g., the *Notice of Proposed Rule Making*, ET Docket No. 94-124, 9 FCC Rcd 7078 (1994), which states, in part, as follows:

Millimeter wave spectrum is suitable for many types of short-range communications systems. The large amount of spectrum available at these frequencies can accommodate the wide channel bandwidth that is needed for rapid transmission of large volumes of data. For example, millimeter wave technology applications could include transmission of high resolution video images, access to large data bases, and communication system backbones. Such systems could also provide short-range wireless access to the NII with wider bandwidth, and therefore greater capacity, than is available from systems operating in lower frequency bands. While spectrum to accommodate wide bandwidth applications is becoming scarce below 40 GHz, the millimeter wave region of the spectrum is largely unused and can accommodate those bandwidths...

9 FCC Rcd at 7082.

unlicensed PCS facilities for which the Commission has just allocated a substantial amount of spectrum at and near 2 GHz; in the U-NII spectrum at 5 GHz under recently adopted rules;⁴ and by existing wireline facilities. As the League has noted repeatedly in recent proceedings, Part 15 operation is itself questionable under the terms of the present Communications Act; provisions for high-powered, unlicensed point-to-point microwave facilities as proposed by Sierra would be plainly impermissible. Part 15 devices have no allocation status, and have had none, internationally or domestically. These devices are permitted on an "at-sufferance" basis: they must not cause interference to licensed radio services, and they must tolerate interference received from licensed radio services in the same bands. The Communications Act of 1934 is devoid of any authority to allow unlicensed devices with substantial interference potential; such devices must be licensed. The only authority to permit unlicensed devices under the Act is with respect to radio control and citizen's radio service facilities. 47 U.S.C. §307(e),⁵ and for the Commission to regulate the interference potential of RF devices by "reasonable regulation". 47 U.S.C. §302. This, the Commission has done by permitting operation of such devices in bands allocated, on a primary basis, to one or more licensed radio services, but only where the

⁴ See *Report and Order*, ET Docket No. 96-102, FCC 97-5, released January 9, 1997. In that action, the Commission amended Part 15 of the Commission's Rules to make available 300 MHz of spectrum at 5.15-5.35 GHz and 5.725-5.825 GHz for use by a new category of unlicensed equipment, called Unlicensed National Information Infrastructure (U-NII) devices. These devices will provide short-range, high-speed wireless digital communications on an unlicensed basis, exactly the proposed purpose of the Sierra products.

⁵ The Telecommunications Act of 1996, Pub. L. 104-104, 110 Stat. 56, Feb. 8, 1996, amended Section 307(e) of the Communications Act of 1934 to add to those services which may by FCC rule operate without individual licenses the aviation radio service for aircraft stations operated on domestic flights when such aircraft are not otherwise required to carry a radio station; and the maritime radio service for ship stations navigated on domestic voyages when such ships are not otherwise required to carry a radio station.

operation of the unlicensed devices has been determined to be unlikely to cause interference to the licensed radio services. In any event, Sierra has made no showing that unlicensed microwave devices at the power levels and antenna gains proposed could be operated safely by non-technical persons, without undue risk of excessive RF exposure.

5. In order to have any Communications Act jurisdiction, therefore, to amend the Part 15 rules as specified, the Commission would have to make a specific finding that the Sierra devices would not cause interference to licensed radio services. Sierra has made no technical showing whatsoever establishing that operation of point-to-point microwave transmitters at 2.5 V/m on a directional basis (as opposed to 250 mV/m on an omnidirectional basis as permitted under the current rules) would not result in interference to existing services. Sierra's argument that the highly-directional nature of the proposed operations obviates "the likelihood of actual harmful interference even to satellite operations", (Petition at 5) is unconvincing: the signal paths to be used by the devices are unpredictable, as are the ubiquitous locations of amateur stations using that band. There is no prior coordination requirement proposed by Sierra, and such would be exceptionally difficult in any case. The interference potential of these devices is thus completely unpredictable. Sierra's consent to the imposition of the further condition that equipment be user-tunable and that users must use the 24.00-24.05 GHz sub-band "only as a last resort" offers absolutely no assurance of interference protection, or compliance by unlicensed individuals. It is a subjective test, ostensibly to be made by non-technical persons, who have no incentive to avoid the 24.00-24.05 GHz segment. Nor is that the only portion of the 24.00-24.25 GHz band at issue.

6. Although Sierra argues that its proposed device configuration would result in operation that would achieve actual compliance with existing Part 15 rules on paths outside the

main lobe of the directional antennas, the proposal clearly calls for considerable power, far and away beyond that permitted for any other Part 15 device,⁶ which inevitably involves significant increased potential for interference within the beamwidth of the directional antenna. Because Part 15 devices are, by definition, subordinate to all licensed uses, any regulation which anticipates power levels of this magnitude clearly must bear a heavy burden of showing no interference potential. Sierra has not done this. Its strongest statement on the subject of interference to Amateur, and Amateur-Satellite facilities, is that it "doubts" that there will be such. When these devices are in place, it will be impossible as a practical matter to cause them to cease operation in the event of interference. The Commission clearly has not the resources to insure compliance; the unlicensed, untechnical users are without any incentive to do so, and there is no ability on the part of amateur licensees to enforce the Commission's rules themselves. The Commission's order in the *Spread Spectrum Transmitters* proceeding allowed for relaxed requirements with regard to directional antennas, but that decision has no application here, where the emission is narrowband, and which therefore has radically different interference considerations than are involved with spread spectrum emissions. The Commission clearly grounded its discussion of the antenna gain issue on the unique character of spread spectrum technologies: "This spreading reduces the power density of the signal at any frequency within the transmitted bandwidth, thereby reducing the probability of causing interference to other signals occupying the same

⁶ It is not clear that the type of operation envisioned by Sierra would permit operation at 2500 mV/m in any case; Section 15.249 permits only 250 mV/m at 3 meters for general Part 15 devices operating at 24.0-24.25 GHz. The Sierra device is not a field disturbance sensor, which is the only type of device which would be permitted to operate at power levels of 2500 mV/m according to Section 15.245, and those are not permitted at that power level at 24.00-24.25 GHz in any case. The basis for allowing such power levels for field disturbance sensors on a non-interference basis at 24.075-24.175 GHz is due to the substantial signal decay at distance from such devices, which would not occur with respect to Sierra's directional, high-gain antennas and substantial transmitter power proposed.

spectrum." *Id.*, 7 CR at 536-37 ¶3. As such, their potential for interference is a unique consideration, and has no application to high-powered, narrowband Part 15 devices.

7. Given that Sierra's proposal envisions unlicensed transmission at significant power levels on bands substantially utilized by licensed services, it is not at all clear that the proposal would have no adverse effect upon existing operations. The claims made by Sierra are insufficient on their face, and unsubstantiated in any case. More specifically, given the nature of the satellite uplink and downlink communications currently authorized in the 24.00-24.05 GHz sub-band, and regular amateur operation in the remainder of the segment, interference from ubiquitous, point-to-point transmitters as envisioned in the Petition would be impossible to accommodate. Any point-to-point communications which would be accommodated by the Sierra proposal can and should be done through 2 GHz PCS facilities, millimeter-wave facilities, licensed, fixed point-to-point microwave facilities, U-NII facilities, or via wireline systems. There is clearly a significant potential for interference to Amateur and Amateur-satellite receivers from transmitters operating at 2.5 V/m at 3 meters that cannot justify the authorization of Part 15 devices of this nature in the 24.05-24.25 GHz band.

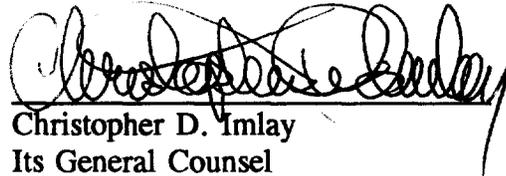
Therefore, for the foregoing reasons, the American Radio Relay League, Inc., hereby opposes the relief requested in the captioned petition for rulemaking and asks that it be denied without further consideration.

Respectfully submitted,

**THE AMERICAN RADIO RELAY LEAGUE,
INC.**

225 Main Street
Newington, CT 06111-1494

By:


Christopher D. Imlay
Its General Counsel

BOOTH FRERET IMLAY & TEPPER, P.C.
5101 Wisconsin Avenue, NW
Suite 307
Washington, DC 20016-4120
(202) 686-9600

December 5, 1997

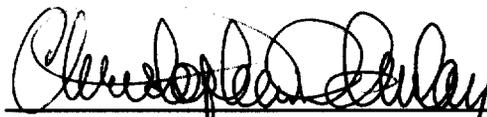
EXHIBIT A

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing COMMENTS OF THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED, was mailed, postage prepaid, this 5th day of December, 1997, to the following:

Mitchell Lazarus, Esq.
Fletcher, Heald & Hildreth, P.L.C.
1300 North 17th Street
11th Floor
Rosslyn, VA 22209
Counsel to Sierra Digital Communications, Inc.

Richard Smith, Chief*
Office of Engineering and Technology
Federal Communications Commission
2000 M Street, N.W., Suite 412
Washington, D.C. 20554



Christopher D. Imlay

*By Hand Delivery