Before the
**Federal Communications Commission**
Washington DC 20554

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| In the Matter of | | |
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| Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed, Mobile and Satellite Frequency Bands | | ET Docket No. 03-237 |

**REPLY COMMENTS OF THE**
**FIXED WIRELESS COMMUNICATIONS COALITION**

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May 5, 2004

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Pursuant to Section 1.415 of the Commission's Rules, the Fixed Wireless Communications Coalition (FWCC) files these reply comments on the Notice of Inquiry and Notice of Proposed Rulemaking in the above-captioned proceeding.[1]

## A. Commission Proposals and FWCC Response

The Commission proposes an " interference temperature" approach to regulating unlicensed transmitters in licensed spectrum: monitoring ambient noise, and letting unlicensed devices exploit any available headroom below the maximum noise level the licensed receiver can tolerate. The present Notice comprises both a Notice of Inquiry (NOI), which sets out the

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[1] *Establishment of an Interference Temperature Metric*, 18 FCC Rcd 25309 (2003) (Notice of Inquiry and Notice of Proposed Rulemaking) (Notice). The FWCC is a coalition of companies, associations, and individuals interested in the Fixed Service -- *i.e.*, in terrestrial fixed microwave communications. Our membership includes manufacturers of microwave equipment, licensees of terrestrial fixed microwave systems and their associations, and communications service providers and their associations. The membership also includes railroads, public utilities, petroleum and pipeline entities, public safety agencies, and/or their respective associations, landline and wireless, local, and interexchange carriers, and telecommunications attorneys and engineers. Our members build, install, and use both licensed and unlicensed point-to-point, point-to-multipoint, and other fixed wireless systems, in frequency bands from 900 MHz to 95 GHz.

concept in general form, and a Notice of Proposed Rulemaking (NPRM) that proposes a specific near-term implementation.

Both parts of the Notice repeatedly mention point-to-point Fixed Service (FS) microwave as a suitable service in which to introduce interference temperature concepts.[2] The Commission states that two properties of FS systems will make them resistant to interference from unlicensed devices: highly directional antennas, which are said to afford protection from signals arriving toward the sides or back of the antenna; and remote siting, which is said to place FS receivers a long way from potentially interfering devices.

Our first-round comments explain in detail how the Commission has overestimated the protective effect of both these characteristics. We will not repeat that showing here.

The NPRM portion of the Notice purports to offer a form of interference temperature regulation in the FS bands at 6525-6700 MHz and 12.75-13.25 GHz.[3] In fact, however, the proposal does not entail any of the essential characteristics of the interference temperature concept as described in the NOI. Rather, the NPRM would merely set up a high-power unlicenced regime in licensed spectrum, protecting licensed receivers only by transmit power control (TPC), dynamic frequency selection (DFS), and duty cycle restrictions.[4] Our first-round comments showed through specific calculations why these mechanisms are inadequate by far to protect FS operations. Again, we will not burden the record by repeating that material.

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[2] *E.g.*, Notice at paras. 11, 31, 34, 36, 37, 40-45.

[3] Notice at para. 31. The proposal excludes 13.15-13.2125 GHz.

[4] Notice at para. 30.

### B. The Docket Shows Only Very Limited Support for the NOI and None Whatsoever for the NPRM.

Few Commission proceedings yield the widespread unanimity seen in this docket. Of the approximately 45 timely-filed comments, representing a broad cross-section of the telecommunications industry, *none* wholeheartedly supports the Notice.

Skepticism extends even to the unlicenced device industry, which would be a direct beneficiary of the Commission's proposals. The Wi-Fi Alliance doubts the interference temperature metric can provide reliable noise level information, and foresees increased equipment and operating costs.[5] IEEE 802 challenges the use of interference temperature in a terrestrial environment and questions the practicality of monitoring interference temperature.[6] It instead urges the Commission to pursue unlicensed operation in bands that are allocated but unused.[7] Proxim Corporation presents a simulation that, it says, shows the "most straightforward" implementation of interference temperature is "fraught with difficulty."[8]

The Commission's proposals are likewise opposed by every other participating industry segment: Fixed Service interests,[9] providers and vendors of mobile licensed service,[10] the radio

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[5] Wi-Fi Alliance at paras. 6-8.

[6] IEEE 802 at paras. 9, 19-20.

[7] *Id*. at 15-17.

[8] Proxim Corporation (pages unnumbered).

[9] New York State; United Telecom Council; Society of Broadcast Engineers; Idaho Power; PacifiCorp; Union Telephone; XCEL Energy Services; National Assoc. of Broadcasters and Maximum Service Telecasters.

[10] Lucent; Nextel; AT&T Wireless; Sprint; Cingular/BellSouth; Verizon Wireless; Nokia; Ericsson; Motorola; Qualcomm.

astronomy and remote sensing communities,[11] satellite service providers,[12] a manufacturer of vehicle radar systems,[13] a prominent amateur radio organization,[14] and many others.[15]

We note particularly the comments of Comsearch, a spectrum management firm and frequency coordinator widely respected for its engineering expertise in radio-frequency interference issues. Comsearch shows that a single unlicensed device *at the present Part 15 emissions limits* in the main beam of an FS receiver will degrade the noise floor at a distance of several kilometers.[16] Increasing the permitted unlicensed power to the levels proposed in the Notice brings a "huge potential for causing harmful interference."[17] Comsearch concludes: "Interference Temperature as proposed in the NPRM would not be effective."[18] With specific reference to the 6.7 and 13 GHz bands proposed in the NPRM, Comsearch observes that FS receivers occasionally must operate down to the thermal noise threshold, which leaves no margin

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[11] National Academy of Sciences Committee on Radio Frequencies; National Radio Astronomy Observatiory.

[12] Sirius Satellite Radio; DirecTV; Inmarsat; Globalstar.

[13] Delphi Corporation.

[14] ARRL.

[15] Closest to an expression of support is Agilent's carefully confined proposal for mobile clients communicating with fixed access points in satellite uplink bands, controlled by a network of "frequency servers." Agilent at 5-7. Agilent excludes operation in FS spectrum. *Id.* at 4. Shared Spectrum Company favors a different model, which appears to assume omnidirectional receivers, and in any event specifically disfavors the 6525-6700 MHz and 12.75-13.25 GHz bands. Shared Spectrum at 18.

[16] Comsearch at 3 & n.2.

[17] Comsearch at 3.

[18] Comsearch at 3.

for underlay devices.[19] Dynamic frequency selection cannot protect FS receivers from unlicensed devices in part because the "detection path" and "interference path" are generally different.[20] "While unable to detect the FS transmitter signal, an unlicensed device could be . . . *capable of causing catastrophic interference to the receiver*."[21] Comsearch backs up these claims with detailed numerical examples.[22]

We explained in our first-round comments that FS links operate over long distances, often tens of kilometers, and carry vitally important safety and infrastructure services that need extremely high levels of reliability -- routinely 99.999% (no more than five minutes outage per year due to all causes) and up to 99.9999% (30 seconds maximum outage per year). Moreover, FS communications are subject to high levels of atmospheric fading. To maintain the availability needed for critical services, FS manufacturers build in -- and FS users pay for -- high levels of fade margin to ensure the link operates under worst-case conditions. That margin cannot be made available to unlicensed devices without seriously jeopardizing FS reliability.

In short, Comsearch, the FWCC, and others have fully rebutted the Commission's proposal for unlicensed operation at 6525-6700 MHz and 12.75-13.25 GHz at levels above the present Part 15 limits.

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[19] Comsearch at 6-7.

[20] Comsearch at 11.

[21] Comsearch at 11 (emphasis added).

[22] Comsearch at 11-17.

## CONCLUSION

The FWCC acknowledges the creative thinking that went into the concept of interference temperature as laid out in the NOI. At least in principle, we agree that real-time monitoring might ultimately enable unlicensed devices to operate at higher power than under the present rules. But the present version of the interference temperature proposal is not suitable for implementation in the FS bands.

*No party favors unlicensed operation in the FS bands under the proposed rules*. As we showed in our first-round comments, and as Comsearch confirms, the safeguards set out in the Notice are not sufficient. We ask the Commission to abandon the idea of introducing higher-powered unlicensed devices in the 6525-6700 MHz and 12.75-13.25 GHz bands.

Respectfully submitted,

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