

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
Revision of Part 15 of the Commission's Rules to)	ET Docket No. 13-49
Permit Unlicensed National Information)	
Infrastructure (U-NII) Devices in the 5 GHz Band)	

**COMMENTS OF THE NATIONAL ASSOCIATION OF
BROADCASTERS**

I. Introduction

The National Association of Broadcasters (NAB)¹ hereby responds to the Notice of Proposed Rulemaking (Notice), which proposes to amend Part 15 of the Commission's rules governing the operation of Unlicensed National Information Infrastructure (U-NII) devices and make available an additional 195 megahertz of spectrum for unlicensed use in the 5 GHz band.² NAB's comments focus on the impact new unlicensed operations, particularly in the 5.35-5.47 GHz or U-NII-2B band, could have on broadcast weather radar systems. These weather radar systems provide advanced weather information, including up-to-the-minute updates on severe weather, which local broadcast stations share with the public during newscasts and coverage of emergencies. As the recent tornado strike in

¹ NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the Federal Communications Commission (FCC or the Commission) and other federal agencies, and the courts.

² See Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, *Notice of Proposed Rulemaking*, ET Docket No. 13-49, released Feb. 20, 2013.

Oklahoma made abundantly clear, accurate weather data that can be rapidly delivered to local communities is a critical public safety priority.

As it considers new rules for unlicensed devices in the 5 GHz region of the spectrum and particularly in the U-NII-2B band, the Commission must take every reasonable step necessary to ensure these important weather radar systems are fully protected from interference. As the Commission acknowledges in the Notice, U-NII devices have a history of causing harmful adjacent channel and co-channel interference to incumbent services in the 5 GHz band. The Notice proposes a number of possible technical solutions for protection of other incumbent services, including Terminal Doppler Weather Radar (TDWR) systems, which can and should be applied to ensure that any new U-NII operations, especially devices operating in the U-NII-2B band, fully protect broadcast weather radar systems. Those technical solutions include improvements to the spectrum sensing rules, a geo-location/database solution and enhanced software security that will prevent users from unlawfully modifying the devices on site. In general, NAB believes a suite of properly implemented technical solutions – discussed more fully below – will protect most incumbent stationary radar systems. We therefore encourage the Commission to modify its U-NII rules to ensure such solutions are built into all unlicensed devices operating in the 5 GHz band.

II. U-NII Devices Should Be Equipped With All Reasonable Safeguards To Ensure They Can Detect and Avoid Interference With Incumbent Services in the 5 GHz Band, and Be Designed To Prevent Unlawful Modification by Users

As the Commission recognizes, “[b]roadcast and media entities use radars operating in the 5.35-5.47 GHz band for tracking storms and providing weather radar information to the public via news and weather reporting. Weather radars are employed by

broadcasters throughout the USA and used to detect supercell storms capable of developing tornados and severe weather.”³ The Notice also recognizes that 5 GHz U-NII devices have a history of causing both co-channel and adjacent channel interference to weather radar operations and that such “interference is unacceptable and must be eliminated, given the public safety risks.”⁴

In the Spectrum Act, Congress directed the FCC to modify part 15 of title 47 of the Code of Federal Regulations so that U-NII devices could operate on new spectrum in the 5 GHz band – specifically in the band between 5.35 and 5.47 GHz. Congress, however, approved this modification to the rules only if, in consultation with the National Telecommunications and Information Administration (NTIA), the Commission determines that “licensed users will be protected by technical solutions, including use of existing, modified, or new spectrum-sharing technologies and solutions.”⁵ Those “licensed users” include non-federal weather radar systems which broadcasters use to provide critical, potentially life-saving, weather information to local communities. In a report published in January, NTIA concluded that more study was needed to determine the impact of unlicensed devices in the U-NII-2B and U-NII-4 bands on federal operations in those bands.⁶ As an initial matter, the Commission should wait for the results of this further study before it finalizes any new rules for these bands.

³ Notice at ¶ 87

⁴ *Id.* at ¶ 42.

⁵ See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, § 6406, 126 Stat. 156, 231 (2012), 47 U.S.C. § 1453 (Spectrum Act).

⁶ See Department of Commerce, “Evaluation of the 5350-5470 MHz and 5850-5925 MHz Bands Pursuant to Section 6406(b) of the Middle Class Tax Relief and Job Creation Act of 2012,” released January 2013 (NTIA 5 GHz Report).

While deployment of U-NII devices in other parts of the 5 GHz band has been largely successful, the FCC has recognized numerous instances of harmful interference caused to incumbent services, often, but not always, caused by unlawful modification and operation of unlicensed devices by users.⁷ Because of this history and the likelihood that this proceeding will usher in a new wave of unlicensed devices in the 5 GHz band, NAB asks the Commission to craft new rules providing broadcast weather radar systems strong interference protection from unlicensed devices.

Although the Notice does not propose technical solutions for protection of broadcast weather radar systems specifically, we agree that “because the types of incumbent services across the 5 GHz spectrum share similar characteristics, the technical requirements for unlicensed devices also could share similar characteristics.”⁸ For example, the Notice proposes that several of the “additional steps” proposed to protect TDWR systems can and should be employed to protect other incumbent services in the 5 GHz band.⁹ We agree. Specifically, in addition to the already-established protective measures required of U-NII devices – transmitter power control (TPC) and dynamic frequency selection (DFS) – NAB suggests that the Commission add geo-location/database and enhanced software security requirements as well, especially for

⁷ See FCC Enforcement Advisory, TDWR and U-NII Devices, “Enforcement Bureau Takes Action to Prevent Interference to FAA-Operated Terminal Doppler Weather Radars Critical to Flight Safety,” (TDWR Enforcement Advisory) DA 12-459, September 27, 2012, Enforcement Advisory No. 2012-07. In addition to documented interference issues associated with TDWRs, NAB is investigating a number of cases where local broadcast stations have experienced interference issues with their weather radar systems likely caused by U-NII devices. NAB will provide more information on this investigation in our reply comments.

⁸ Notice at ¶ 95.

⁹ Notice at ¶ 50.

higher-powered U-NII devices intended for outdoor operation. We briefly address each of these technical solutions below.

A. Spectrum Sensing/DFS

As existing U-NII devices already are required to employ radar avoidance spectrum sensing technology, it is uncontroversial that new U-NII devices operating in the U-NII-2B band should also employ a DFS mechanism. The Notice proposes a number of improvements to the existing sensing rules that will help limit potential interference to incumbent services.

Existing rules require that a U-NII device sense for radar across only 80 percent of its occupied bandwidth. If a “radar signal falls within the [20 percent] of occupied bandwidth that does not require sensing, the U-NII device will continue to transmit” and likely cause harmful interference.¹⁰ Furthermore, with the introduction of new unlicensed devices that will be operating on wider bandwidths under the IEEE 802.11ac standard, the Commission has recognized that existing frequency separation parameters – 30 MHz separation for devices employing a 20 MHz bandwidth – may not be sufficient. For these reasons, we agree with the Commission’s proposal that a U-NII device should sense for radar not only on 100 percent of its occupied bandwidth but also on frequencies immediately adjacent to its occupied bandwidth.¹¹

¹⁰ Notice at ¶ 63.

¹¹ Notice at ¶ 65.

B. Geo-Location/Database

As evidenced by the numerous interference problems that plagued TDWR systems, spectrum sensing alone – even if it performs as designed – does not always prevent harmful interference to incumbent systems.¹² Given the critical nature of incumbent radar systems in the 5 GHz band, we believe the Commission should implement, in addition to enhanced spectrum sensing requirements, a geo-location/database solution that ensures U-NII devices properly comply with frequency and distance separation requirements.

Geo-location “spectrum-sharing technologies can be used in conjunction with a well maintained, current database to define geographic areas where device operation will and will not be permitted.”¹³ Similar to the rules governing unlicensed device use in the TV white spaces, a device’s location should be determined by an installed GPS or other geo-location mechanism built into the device; then an external database would determine whether the device is far enough from an incumbent service to avoid harmful interference.¹⁴ Like TDWRs, for which the Commission proposes a possible geo-

¹² See NTIA 5 GHz Report at 3-4. Investigations into instances of interference to TDWR systems by U-NII devices showed, among other things, that even when “DFS functionality performed properly,” the device still caused harmful interference or “failed to detect TDWR.” See *also*, NTIA, Technical Report TR-12-486, John E. Carroll et.al., “Case Study: Investigation of Interference into 5 GHz Weather Radars from Unlicensed National Information Infrastructure Devices, Part III,” released June 2012 (noting that DFS mechanisms failed to adequately identify the proper waveform of TDWR systems).

¹³ NTIA 5 GHz Report at 2-6.

¹⁴ NAB does not believe that a requirement for “professional installation” is a suitable substitute for device-based geo-location capability. The Commission has already documented a number of interference cases involving U-NII devices where the device was reprogrammed to operate at unauthorized power levels and on unauthorized frequencies. Relying on a system where the operator or installer can type in or indicate any location for the device is a prescription for interference to occur since the operator and installer will have every incentive to select locations where the device will operate with the least constraints despite the devices proximity to protected radar installations.

location/database solution,¹⁵ broadcast weather radar systems are limited in number and stationary. Therefore, a geo-location/database solution should work very well as a supplement to existing sensing requirements. A geo-location/database solution would also make it easier to identify and remotely shutdown any device causing harmful interference. According to the Notice, WISPA has already implemented a database solution for TDWR systems.¹⁶ NAB suggests that broadcast weather radar systems be added to that database.

C. Enhanced Software Security

Even a well-designed and properly adjusted U-NII device can cause harmful interference if that device is reconfigured by a user to function outside the device's intended operational parameters. As the Commission notes, existing U-NII devices can be modified easily by the user through software changes.¹⁷ User manipulated devices are often the source of the most offending interference issues, and could create major problems for incumbent radar systems. NAB therefore strongly agrees with the Commission's proposal that manufacturers be required to "implement security features in any digitally modulated device capable of operating in the U-NII bands, so that third parties are not able to reprogram the devices to operate outside the parameters for which the device was certified."¹⁸ We further support rules requiring that a device should become inoperable if a user tries to modify the software or firmware. We also agree that U-NII

¹⁵ See Notice at ¶ 55.

¹⁶ See Notice at ¶ 55.

¹⁷ See Notice at ¶ 43.

¹⁸ Notice at ¶ 51.

devices should be required, through their software, to transmit identifying information so that each device can easily be identified in the event of harmful interference.¹⁹

III. Conclusion

Weather radar systems play a central role in a broadcaster's public service mission and provide critical, timely and potentially life-saving data on severe weather. For this reason, it is imperative that if unlicensed devices are approved for operation in the U-NII-2B band, they cannot interfere with incumbent radar systems in any circumstance. With a full suite of proper interference protection measures in place, such as those listed above, unlicensed devices can operate harmoniously with incumbent services in the 5 GHz band.

Respectfully submitted,



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¹⁹ *Id.*