

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

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
Additional Spectrum for Unlicensed Devices	)	ET Docket No. 02-380
Below 900 MHz and in the 3 GHz Band	)	

**COMMENTS OF  
THE NATIONAL CABLE & TELECOMMUNICATIONS ASSOCIATION**

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The National Cable & Telecommunications Association (“NCTA”) hereby submits its comments on the Notice of Proposed Rulemaking (“Notice”) in the above-captioned proceeding.

NCTA is the principal trade association representing the cable television industry in the United States. Its members include cable operators serving more than 90 percent of the nation’s cable television subscribers. In addition to providing multi-channel video programming services, cable operators also provide high-speed Internet services, and are increasingly offering facilities-based voice services. NCTA members also include more than 200 cable programming networks, and suppliers of equipment and services to the cable industry.

**INTRODUCTION**

The cable industry generally supports the Commission’s efforts to free up broadcast television spectrum for use by unlicensed devices that can promote competition and consumer choice in the ever-growing area of wireless access to the Internet and other

multi-media offerings. However, these efforts must not prevent cable customers from continuing to enjoy the rich and diverse products and services offered on cable systems. There are several areas of concern that must be addressed if unlicensed devices are to operate in conjunction with cable systems, terrestrial broadcast television stations, and the consumer's home electronics devices.

**I. BROADCAST TELEVISION INTERFERENCE**

Cable systems receive cable and local broadcast television programming at the cable headend for distribution to cable customers. In the case of broadcast television programming, most cable headends receive terrestrial broadcast signals by using tower-mounted high-gain directional terrestrial antennas, subsequently combining them with cable programming for retransmission within the cable system. While these broadcast signals are generally received at the cable headend within the Grade B contour defined by the FCC, and therefore are protected under the proposed rules, there are many instances where broadcast signals are received at the cable headend at locations outside of the Grade B contour, many of which signals are deemed "must carry." Under the proposed rules, unlicensed devices will be able to transmit on channels used for receipt of distant broadcast television signals, therefore increasing the likelihood that there will be interference with a local broadcast signal received from outside the Grade B contour, particularly in rural markets.

For example, if a distant television station transmitting on a 1,000 foot tower with a transmit power of 316kW EIRP and 65 miles from the cable headend, the calculated carrier to interference (C/I) ratio, assuming an unlicensed personal/portable device within one-tenth of a mile of the receive antenna, is approximately 2dB, during unfaded conditions.

Using the same assumptions, an unlicensed fixed device at a distance of one mile from the receive antenna yields a C/I ratio of 5dB. With this small but consequential difference between the desired signal strength and the undesired signal strength, interference is certain to occur. Moreover, interference is even more likely due to anomalous propagation conditions which cause fades in the distant broadcast signal, but does not affect the unwanted signal from a nearby unlicensed device. Under the proposed rules, protection from harmful interference will be afforded to receivers within the Grade B contour, but not to receivers located outside of the Grade B contour. NCTA urges the Commission to extend this protection to those circumstances where local broadcast signals are received from outside the Grade B contour. Cable headends should be able to reliably receive broadcast signals, regardless of whether the signal is inside or outside the Grade B contour.

Furthermore, it is unclear how interfering devices would be identified, and resulting interference ameliorated. This is potentially problematic because these devices are likely to proliferate in a fashion similar to currently operational IEEE 802.11 wireless devices. Even assuming that these devices are able to signal their presence by means of a unique identifier, the process of detecting and alerting the owner or owners of interfering device(s) is not set forth. This is particularly troublesome in the case of must carry broadcast signals, where Commission rules already impose regulatory requirements on broadcasters and cable operators. In urban areas, the presence of hundreds or thousands of the devices could create an electromagnetic cloud making it nearly impossible to identify a single source of interference in the presence of many such sources.

Moreover, it is unclear how detection and identification of an interfering device can be accomplished. This capability assumes the party experiencing the interference has the necessary equipment and trained personnel to remedy the interference, even though the method to be used and the technology required is unknown. Prior to authorizing the unlicensed devices, the Commission should first adopt a procedure to prevent this unacceptable risk to cable operators and their subscribers.

## **II. INTERFERENCE MITIGATION**

The Notice discusses various approaches by which providers of unlicensed devices will be able to determine what broadcast spectrum is unused for a given geographical area. Among the methods discussed: sensing and detecting the presence of incumbent signals; transmission of available frequency information over-the-air to unlicensed devices; and identification of geographic location in conjunction with a centrally maintained database. These methods, however, raise a number of questions as to the most efficient means of preventing harmful interference, particularly when distant terrestrial broadcast signals are received at cable headends outside the Grade B contour.

With the sensing and detection method, for example, at the periphery of the Grade B contour or beyond, it is possible that the signal strength of a television transmitter may be equal to or below the signal strength necessary for an unlicensed device to accurately sense and detect the presence of a legitimate terrestrial broadcast transmission. Because of the high gain and high tower mounting of the directional receive antennas used at cable headends, it is likely that a broadcast signal that provides adequate quality to the cable operator will be undetectable to the unlicensed device. Should this occur and an

unlicensed device begins transmitting, a cable headend may no longer be able to reliably receive the broadcast signal.

If unlicensed devices utilize mitigation methods involving receipt of available frequency control information from a remotely transmitted source, it is unclear how a given device would be able to determine what control source to adhere to if more than one signal exists for a given geographic location. This may be particularly problematic given the likelihood that in some areas of the country frequency control information would overlap for a specific location.

The Notice discusses the utilization of a centrally maintained database and professional installation for tracking and identification of the location of the unlicensed device. While this method might effectively be used to identify unlicensed devices at a fixed location, it is uncertain how it could be used in the tracking of portable devices. It also raises the question of who will be responsible for operating and maintaining this database.

It will be challenging to develop the necessary methods to prevent harmful interference. If the Commission elects to use any of the proposed methods, we urge the agency to reevaluate its proposal to limit the application of these methods within a Grade B protected contour, so that cable systems continue to reliably receive broadcast signals.

### **III. DIRECT PICKUP**

NCTA is also concerned that harmful interference may occur when unlicensed devices are situated in close proximity to existing consumer electronics devices, such as television receivers and VCRs. Television devices that are connected to cable systems will be especially susceptible to direct pickup of interference from these unlicensed devices.

As noted in the Consumer Electronics Association's "Test Plan for Unlicensed Operation in TV Bands,"<sup>1</sup> the allowed signal strength from unlicensed devices is likely to exceed the 100mV/m direct pickup immunity specified for analog cable-ready devices in Section 15.118 of the Commission's rules. These devices typically tune cable channels across the entire cable spectrum. While an unlicensed device may find a section of the TV band which is unused for terrestrial broadcast, this spectrum will typically be used by the cable operator to deliver programming or other services. As a result, unlicensed devices would be operating on the same channels that the consumer is using within their home for receiving cable channels. For the millions of television receivers and VCRs connected to cable, this will result in uncorrelated direct pickup noise, and an impediment to reliable reception of products and services that cable customers enjoy today.

NCTA urges the Commission to adopt procedures to constrain the signal strength output of these unlicensed devices in order to mitigate the potential for harmful interference to consumer electronics receivers connected to cable systems.

### **CONCLUSION**

Operation of unlicensed devices in the unused broadcast television spectrum, while potentially facilitating more widespread use of the spectrum for new services, carries with it many technological and operational challenges that must be resolved prior to deployment. The public expectation of high quality broadcast television signals and other services from cable operators should not be compromised. NCTA urges the Commission to adopt standards and methods to deter interference with a cable operator's receipt and transmission of terrestrial broadcast television for retransmission to its customers. In addition, NCTA urges the Commission to develop processes for determining available

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<sup>1</sup> CEA Notice of Ex Parte Presentation, ET Docket Nos. 04-180, 02-380, Oct. 14, 2004.

frequencies and specific plans to discover interfering devices, and to ameliorate the effects of direct pickup noise of unlicensed devices in consumer electronics receivers connected to cable facilities

Respectfully Submitted,

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