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KATHLEEN VICTORY
HOWARD M. WEISS

* NOT ADMITTED IN VIRGINIA

1300 NORTH 17th STREET, 11th FLOOR
ARLINGTON, VIRGINIA 22209

OFFICE: (703) 812-0400
FAX: (703) 812-0486
www.fhhlaw.com
www.commlawblog.com

RETIRED MEMBERS
VINCENT J. CURTIS, JR.
RICHARD HILDRETH
GEORGE PETRUTSAS

OF COUNSEL
ALAN C. CAMPBELL
THOMAS J. DOUGHERTY, JR.
ROBERT M. GURSS*
KATHRYN A. KLEIMAN
TONY S. LEE
ROBERT J. SCHILL
RICHARD F. SWIFT

December 13, 2013

MITCHELL LAZARUS
(703) 812-0440
LAZARUS@FHHLAW.COM

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

Re: Docket No. 12-268, *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*
Ex Parte Communication

Dear Ms. Dortch:

On behalf of Sennheiser Electronic Corporation, pursuant to Section 1.1206(b)(1) of the Commission's Rules, I am electronically filing this written *ex parte* communication in the above-referenced docket.

CTIA – The Wireless Association (filed Nov. 18, 2013) (CTIA Reply) opposes Sennheiser's request that 600 MHz auction winners be required to partially reimburse wireless microphone users for the cost of replacing equipment made unusable by reallocation of the 600 MHz band to wireless data services.[1]

At the outset, CTIA has mischaracterized the request. Sennheiser does not seek reimbursement to wireless microphone *manufacturer*s, as CTIA states,[2] but rather to wireless microphone *users*—not only professional broadcasters, filmmakers, theaters, and concert promoters, but also churches, schools, community organizations, political groups, and countless others—people who lack meaningful input to the Commission's spectrum policies, yet stand to suffer financial damage from the reallocation.

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1 Comments of Sennheiser Electronic Corporation (filed Nov. 4, 2013) (Sennheiser Comments).

2 CTIA Reply at 7.

CTIA's filing contains several other inaccuracies as well.

1. THE COMMISSION HAS ALL NECESSARY STATUTORY AUTHORITY TO REQUIRE REIMBURSEMENT.

CTIA argues that the Middle Class Tax Relief and Job Creation Act of 2012 (Spectrum Act) does not authorize reimbursement of wireless microphone users.[3] Sennheiser's request does not invoke the Spectrum Act. Rather, the same Title III provisions the Commission relied on to require reimbursement following previous auctions apply here as well.[4]

2. WIRELESS MICROPHONES ARE NOT "SECONDARY"—AND THEIR BEING SECONDARY WOULD NOT CHANGE THE OUTCOME.

CTIA asserts that TV-band wireless microphones are authorized on a secondary basis, and for that reason (among others) are not entitled to reimbursement.[5]

The Table of Frequency Allocations shows no secondary allocation in the TV bands.[6] Wireless microphones therefore cannot be secondary.

CTIA cites a Commission order that describes wireless microphones and certain other devices as "secondary."[7] That order in turn cites footnote NG115 in the Table of Allocations, which states:

> In the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-698 MHz [the TV bands], wireless microphones and wireless assist video devices may be authorized *on a non-interference basis*, subject to the terms and conditions set forth in 47 CFR part 74, subpart H.[8]

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[3] CTIA Reply at 8.

[4] *See* Sennheiser Comments at 7-8.

[5] CTIA Reply at 8.

[6] 47 C.F.R. § 2.106.

[7] CTIA Reply at 8, *citing Revision to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 25 FCC Rcd 643 at ¶¶ 8-9 (2010) (*Wireless Microphone Order*).

[8] 47 C.F.R. § 2.106, footnote NG115 (emphasis added).

The same order also cites other provisions that require wireless microphones to avoid causing harmful interference to authorized stations.[9]

There being no secondary allocation in these bands, the Commission's references to "secondary" can only be a shorthand synonym for "non-interfering." There is no *a priori* bar to reimbursement for a device that operates on a non-interference basis.

For that matter, there is no *a priori* bar to reimbursement for a secondary device, either. Even if CTIA were correct that wireless microphones operate under a secondary allocation, nothing stops the Commission from deciding as a policy matter their users should be reimbursed.

To be sure, a past proceeding limited paid relocation to primary users on the theory that secondary operations, by definition, cannot cause harmful interference to incoming primary users.[10] The secondary users in that proceeding, however, had accepted new secondary licenses knowing they might later be displaced by a new use of the band.[11] Indeed, they knew specifically that they were secondary to the incoming licensees. In contrast, the wireless microphone users here accepted non-interference (not secondary) status relative to *broadcast* licensees, with no hint of a possible reallocation to new wireless services.

3. THE 700 MHZ PROCEEDING IS NOT A PRECEDENT FOR 600 MHZ.

CTIA says: "As was the case with the 700 MHz band clearing, the Commission should require wireless microphone operators to handle their own relocation costs."[12] In fact, however, the Commission did not "require" 700 MHz wireless microphone operators to handle their own relocation costs. The Commission never ruled on the question because wireless microphone interests never raised it. The Commission is writing on a blank slate as to 600 MHz wireless microphones—although, of course, it has required reimbursement in the past for many other categories of incumbents. The industry's decision not to seek reimbursement at 700 MHz should not be held against it here.

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9 *Wireless Microphone Order* at ¶ 9.

10 *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz*, Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order, 18 FCC Rcd 2223 at ¶ 72 (2003).

11 *Id*. at ¶ 67.

12 CTIA Reply at 8.

4. 700 MHz Wireless Microphone Users Had No Advance Notice of a Coming 600 MHz Reallocation.

CTIA cites events that, it says, adequately warned 700 MHz users not to relocate to the 600 MHz band.[13] Its analysis of the dates is mistaken.

The Commission's first formal proposal to eliminate wireless microphones from the 700 MHz band came on August 21, 2008.[14] As the Commission notes, some manufacturers had earlier begun to warn their customers that the band might be in jeopardy.[15] With release of the August 2008 NPRM, the manufacturers moved into high gear with a major (and ultimately successful) effort to transition wireless microphones out of 700 MHz.

CTIA says the Commission gave notice of its intent to pursue TV-band incentive auctions in the National Broadband Plan, released on March 16, 2010.[16] That document, however, did not specify which parts of the TV band might be reallocated. The Spectrum Act, enacted on February 22, 1012, likewise omitted any mention of particular channels.[17] The first official indication that the 600 MHz band might be at risk did not come until release of the Incentive Auction NPRM on October 2, 2012.[18]

Still, even accepting CTIA's reading that the National Broadband Plan gave adequate notice of a 600 MHz reallocation, that came nineteen months *after* the August 2008 proposal to clear wireless microphones from 700 MHz, and long after manufacturers had begun working with their customers to relocate.

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13 CTIA Reply at 9.

14 *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band*, Notice of Proposed Rulemaking and Order, 23 FCC Rcd 13106 at ¶ 14 (2008). The "Order" part of this document froze equipment certifications for 700 MHz low power auxiliary station devices (including wireless microphones) and suspended acceptance of license applications for operations after February 17, 2009, which then was the projected DTV transition date.

15 *Id*. at ¶ 11.

16 CTIA Reply at 9.

17 CTIA also cites a 2010 order as warning that wireless microphones might be affected by possible TV reallocations, but again, that order was silent as to what channels might be affected. CTIA Reply at 9 n.19, *citing Unlicensed Operation in the TV Broadcast Bands*, Second Memorandum Opinion and Order, 25 FCC Rcd 18661 at ¶ 133 (2010).

18 *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357 at ¶¶ 123 *et seq*. (2012).

CTIA tries to evade this time sequence by specifying June 12, 2010—three months after the National Broadband Plan—as "the 'hard' deadline" for 700 MHz wireless microphone clearance.[19] That date, however, is when the clearance had to be *completed*,[20] which means it had to have commenced much earlier.

In short, at the time when responsible manufacturers and users would have had to make their transition plans out of 700 MHz, there was no official hint of *any* other TV reallocation, much less the specifics of the 600 MHz band. To the contrary: the Commission's press release accompanying the August 2008 NPRM, warning that wireless microphones must vacate 700 MHz, stated they would be able to continue operating in broadcast TV channels below 700 MHz.[21] CTIA cannot fault the wireless microphone industry for relying on the Commission's express, then-uncontradicted assurances.

5. CTIA UNDERSTATES THE TECHNICAL DIFFICULTIES OF PROVIDING FREQUENCY-AGILE WIRELESS MICROPHONES.

CTIA says that wireless microphone manufacturers "have now had several years to design frequency-agile equipment that could be readily retuned to alternate channels" in case of broadcast spectrum reallocations.[22]

If the matter were that simple, Sennheiser and its competitors would have done as CTIA suggests. But CTIA overlooks several technical issues. First, to make a wireless microphone capable of performing adequately over a very wide range of frequencies is possible, but expensive. Sennheiser does make a high-end product that tunes across the entire UHF TV range, but its cost is out of line for most applications. Second, the spectrum squeeze set off by the incentive auction will require not just retuning, but a redesign, and possibly external accessories as well, to allow denser channel occupancy—which also adds cost.[23] Third, even after such a redesign, many professional users will still be unable to relocate displaced 600 MHz units into lower UHF frequencies, due to the available channels being fully occupied with other wireless microphones and monitors. Sennheiser and others have begun efforts that we hope will eventually move some wireless microphone applications entirely out of the TV bands. Because of regulatory constraints, among other factors, this cannot happen in time to address the upcoming 600 MHz reallocation.

Wireless microphones must be able to prevent or suppress the "intermodulation products" that can arise from combinations of strong signals on nearby frequencies, such as active TV transmission, together

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[19] CTIA Reply at 9.

[20] *Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band*, Report and Order and Further Notice of Proposed Rulemaking, 25 FCC Rcd 643 (2010).

[21] *FCC Proposes the Prohibition of Low Power Auxiliary Stations in the 700 MHz Band after the Digital Television Transition*, Press Release (released Aug. 21, 2008).

[22] CTIA Reply at 9.

[23] For details, see Sennheiser Comments at 6-7 & n.8.

with the signals from the microphone in question and others in use nearby. If uncontrolled, the intermodulation products can cause audible interference. Their number goes up sharply with the number of strong signals present in the microphone's receiver passband. A system that tunes across a large frequency range needs a correspondingly wide filter window, which allows in many more unwanted signals and thereby threatens much more intermodulation interference. The problem can be partially avoided through filtering, and partially through making the microphone circuitry highly "linear." Both measures add significant cost. Filtering requires additional components. Increased linearity requires more expensive electronics throughout and also increases battery drain.

The engineering challenge is to find a practical balance among intermodulation suppression and prevention, tuning range, battery life, and overall expense. If highly frequency-flexible wireless microphones were feasible, at reasonable incremental cost, one or more of the manufacturers would have sought an advantage by offering them. The absence of competitively-priced units from the market is one indication of the technical barriers to making such devices.

6. SIMPLE FAIRNESS REQUIRES REIMBURSEMENT TO DISPLACED WIRELESS MICROPHONE USERS.

CTIA omits any mention of the equities underlying Sennheiser's request: wireless microphone users being put to great expense—for the second time in just a few years—to clear spectrum which CTIA members will use to sell services and generate revenues. Requiring major expenditures by one group, for the sole benefit of another, is simply unfair. The Commission has recognized the potential for this kind of injustice in other auctions, and required auction winners to compensate incumbents for the cost of relocation. It should do so here as well.

Please do not hesitate to contact me with any questions.

Respectfully submitted

Mitchell Lazarus
Counsel for Sennheiser Electronic Corporation

cc: Craig Bomberger
Mignon Clyburn
Mark Colombo
Gary Epstein
Rebecca Hanson
William Huber
Julius Knapp
Barbara Kreisman
William Lake
John Leibovitz
Gary Michaels
Ruth Milkman
Alison Neplokh
Michael O'Rielly
Jamison Prime
Kelly Quinn
Ajit V. Pai
Jessica Rosenworcel
Erik Salovaara
Edward Smith
Alan Stillwell
Robert Weller
Tom Wheeler
Margaret Wiener

Michael F. Altschul
Scott K. Bergmann
Krista L. Witanowski
CTIA – The Wireless Association