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

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

Dear Ms. Dortch:

CBF Networks, Inc. (d/b/a Fastback Networks) ("Fastback") writes to bring the Commission's attention to an anomaly in the rules for Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band in Section 15.407 b(4). As explained in detail below, the anomaly is that the rules governing this band apply the same restrictive out-of-band- emission (OOBE) limits that are needed to protect the Terminal Doppler Weather Radar (TDWR) band to the U-NII-4band. These restrictive limits are not only unnecessary in the U-NII-4 band, which has no TDWRs, but create a significant impact on users because, in order to meet these limits, serious compromises must be made in providing the connectivity required to improve service to the general public.

As a preliminary matter, Fastback reiterates its support for the Petitions that seek reconsideration of the more restrictive out-of-band emissions limits for devices that operate in the 5725-5850 MHz band that were adopted in the *First R&O*. Fastback is also a member of the group of wireless and critical information industries who reached consensus on a proposal for changes to rules for the 5.15-5.25 GHz and 5.725-5.85 GHz ISM bands, which was filed in the above-referenced docket on March 23, 2015 and reflected in an *ex parte* filing of March 31, 2015. Fastback strongly supports that

proposal. Fastback requests that, when the Commission addresses the group's "consensus" rule changes, it also adopts Fastback's proposed changes that are intended to correct the rule anomaly addressed herein.

Background

Fastback is an equipment provider with products in the 5 GHz band that use modest antenna gain for point-to -point backhaul applications. Fastback brings broadband connectivity to a wide range of users, providing links that allow increased density in high-traffic urban areas as well as high-speed, low-latency broadband access to underserved areas.

Fastback is well aware that airport Doppler radars provide mission critical capability for alerting air traffic controllers to dangerous weather conditions. There are forty-six Doppler radars operating around the country, all in the Terminal Doppler Weather Radar (TDWR) band in the 50 MHz range from 5.60–5.65 GHz. The TDWR equipment uses very large high-gain antennas, which makes the radars very susceptible to low levels of unintended signals from other transmitters using the band. Therefore, the FCC's dynamic frequency selection (DFS) rules require that, to protect TDWRs, other equipment in this band must first listen for the presence of a radar to determine if it is within close enough range that its own transmission would be disruptive to the radar.

U-NII-3/4 Band Anomaly

When a transmitter operates in a different band from the TDWR band, it must filter its unintentional out of band emissions (OOBE) that spill over into the TDWR band as specified in Section 15.407 of the Commission's rules. The problem is, however, that the OOBE restrictions in 15.407(b)(4) cover a much broader range of frequencies than is required to protect TDWRs and, as such, are overly restrictive in bands where no TDWRs are being protected. One of these bands is the U-NII-4 band, which extends from 5.85–5.925 GHz. This band is known both as the Dedicated Short Range

Communications Service (DSRCS) band and the Intelligent Transportation System (ITS) band, which the transportation industry is expected to use for a variety of purposes.[1]

The U-NII-3 band, which extends from 5.725–5.85 GHz, is adjacent to the U-NII-4 band and has been the mainstay for wireless Internet service providers and backhaul providers for over a decade. The anomaly of the rules governing this band is that they apply the same restrictive OOBE limits that are needed to protect the TDWR radar band to the adjacent ITS band. As noted above, to meet these overly-restrictive limits, serious compromises must be made in providing the connectivity required to improve service to the general public.

The same restrictive OOBE limits necessary to protect the TDWR radar band are not needed in the U-NII-4/ITS band because equipment in the U-NII-4/ITS band is not as vulnerable as TDWRs as they do not use the high-gain antennas that the radars use. Hence, there is no need to require equipment operating in the U-NII-3 band to meet the same strict level of OOBE regulation for emissions in the U-NII-4 band.

Fastback Proposal

Current Section 15.407 (b)(4) of the Commission rules reads as follows:

> *For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.*

While this rule uses a blanket application of a strict limit outside of the operating band, it is really only applicable to the lower band edge (*i.e.*, OOBE below the U-NII-3 band into the sensitive TDWR band). The sensitive TDWR band is protected by the limit of -27 dBm/MHz. But, as noted above, the same strict limits above the band edge of U-NII-3, *i.e.*, in the U-NII-4/ITS band, are not necessary. Therefore it makes sense to

[1] There is also proposed legislation directing the FCC to investigate if the ITS band can be made available for widespread commercial use ("The Wi-Fi Innovation Act") including serving low-income communities.

separate the lower band edge and upper band edge restrictions, which Fastback suggests doing with the following proposed change to Section 15.407(b)(4):

> *For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 5 MHz above the band edge shall not exceed an e.i.r.p. of −10 dBm/MHz; All emissions within the frequency range from 5 MHz above the band edge to 75 MHz above the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; All emissions in the frequency range extending 75 MHz above the band edge shall not exceed an e.i.r.p. of −27 dBm/MHz; [Emissions below the band edge to-be-determined as per modifications of the current rules based on the other aforementioned submissions.]*

By way of explanation, there are several standards that apply to the use of the U-NII-4 band for transportation purposes. ITS is governed under FCC Sections 90.375, 95.1511, and 95.639(i), which set the channels and limit the power for infrastructure and mobiles. Moreover, the IEEE Std. 802.11p Wireless Access in Vehicular Environments (June 2010) specifies a physical layer protocol for rapid acquisition of Wi-Fi base stations while in a moving vehicle and adds additional constraints for adjacent channel rejection and spectral mask to the existing 802.11a OFDM standard. It specifies the use of both 5 MHz and 10 MHz channel bandwidths, although the focus seems to be on 10 MHz channel use. Operating 802.11a at this lower bandwidth invokes specifications from the standard which improves the resistance to multipath for operation outdoors. The IEEE 1609 Family of Standards for Wireless Access in Vehicular Environments (WAVE) (April 2013) covers the transport layer, network layer and security services for ITS.

The FCC has designated seven channels in the U-NII-4 band that are 10 MHz wide. The channel closest to the U-NII-3 band has the special designation for "collision avoidance safety" to be used for vehicle to vehicle communications for protection of life and property. However, the current OOBE specifications for U-NII-3 do not protect this channel as much as the other channels. The first 10 MHz above the U-NII-3 band edge is only specified to be at -17 dB/MHz, and that extends half-way into this safety channel. There is no reason to force the remaining half of the channel to be 10 dB more restrictive.

Since this channel has been designated the most critical of the channels, it makes sense that any limit that does not create a higher potential vulnerability than already applies in this channel, should not be of greater concern. Therefore, Fastback's proposed change would be to extend this -17 dBm/MHz rule out to the upper end of the U-NII-4 band. Furthermore, there is a 5 MHz portion at the bottom of the U-NII-4 band between the upper band edge of the U-NII-3 band and the start of the first U-NII-4 channel. It is proposed that this 5 MHz be considered a transition band into the ITS channels.

Fastback's calculations show the OOBE limits above the U-NII-3 band edge can be relaxed by at least 15 dB for point-to-point radios without impacting communication range or performance for ITS or Wi-Fi equipment operating in the U-NII-4 band. Fastback's proposal, however, is more conservative than that. Without regard to any changes to the Commission's rules resulting from possible adoption the Wi-Fi Innovation Act requirements, this proposed relaxation of the U-NII-3 OOBE limits will not impact ITS operation adversely, while providing needed relief to operation of equipment in the U-NII-3 band.

Conclusion

Fastback requests that, when the Commission addresses the group's "consensus" rule changes referred to above, it also adopts Fastback's proposed changes that are intended to correct the rule anomaly addressed herein.

Respectfully submitted,

By: _____
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