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January 25, 2010

Ms. Marlene Dortch  
Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, DC 20554

**Re: Written Ex Parte Presentation  
Petition for Rule Making Regarding 700 MHz Equipment  
WT Docket No. 09-66, GN Docket No. 09-157**

Dear Ms. Dortch:

QUALCOMM Incorporated (“Qualcomm”) hereby joins in Verizon Wireless’ December 18, 2009 letter opposing the “Petition for Rule Making Regarding the Need for 700 MHz Mobile Equipment to be Capable of Operating on All Paired Commercial 700 MHz Frequency Blocks,” (the “Petition”), which was filed as an ex parte submission in the above-referenced dockets.

**I. Summary**

As explained herein, while Qualcomm is working with all affected stakeholders (including carriers, infrastructure vendors, and device manufacturers) to ensure that mobile broadband technology can be deployed on the 700 MHz band as quickly and as broadly as possible, a grant of the relief requested in the Petition would: 1) delay any mobile broadband deployments at 700 MHz for an unspecified period of time; 2) drive up the costs of devices supporting the Lower and Upper 700 MHz bands by an unspecified amount; 3) imperil Qualcomm’s ongoing development of chipsets for the Lower and Upper 700 MHz bands; and, above all, 4) unnecessarily deprive American consumers of new mobile broadband networks and devices. The seemingly never-ending, exponential growth in demand for, and usage of, mobile broadband, and the ultra-competitive US wireless market are driving the need to roll out mobile broadband networks and devices on the Lower and Upper 700 MHz bands as soon as possible. There is no need for any FCC action.

In addition, a grant of the Petition would increase the potential for interference within the Lower and Upper 700 MHz bands. Interference within these bands can be mitigated through the use of narrower filters in the duplexers used in 700 MHz devices. But, the relief requested would effectively mandate the use of wider filters since each device would be required to operate across the entirety of the paired commercial Lower and Upper 700 MHz bands, and the wider filters are less likely to mitigate interference.

Moreover, the Petition fails to take account of the Commission's policy of technology neutrality. The relief requested in the Petition is a requirement that all 700 MHz mobile equipment be capable of operating on the paired commercial spectrum blocks within the entire Lower and Upper 700 MHz bands, apparently no matter what air interface is utilized by each licensee of each 700 MHz spectrum block. Since March 2007, Qualcomm's FLO TV subsidiary has operated its FLO mobile broadcast network on the Lower 700 MHz D block (formerly Channel 55). Verizon Wireless and AT&T have sold, and are selling, FLO-enabled cell phones to their subscribers. In addition, since last year, FLO TV has sold, and is selling, FLO-only, dedicated personal mobile television devices, and in partnership with Audiovox, FLO TV is selling FLO-based rear seat solutions for installation in cars.

A grant of the Petition would outlaw these FLO devices since the devices are 700 MHz mobile equipment, but they are nominally capable of operating only on one frequency block in the 700 MHz band and not on any of the paired commercial 700 MHz frequency blocks. That result would be irrational. It is true that the devices are capable of operating on only one 700 MHz block, but that is the only 700 MHz block on which FLO is currently deployed, and there is no reason why this 700 MHz mobile equipment needs to support any, much less all, of the paired 700 MHz blocks. In fact, granting the requested relief would effectively eliminate the dedicated personal television (PTV) devices, which are receive-only for mobile broadcast by design. Upon a grant of the requested relief, these devices would have to include multiple filters and support technologies for unicast services to be deployed on the paired 700 MHz blocks. These additions would raise the cost of these devices, but would serve no purpose given the function of the devices, namely to receive mobile broadcast services.

The Petition cites a 1981 Commission decision which required cellular devices to operate on both blocks of cellular spectrum, but at that time, the Commission mandated that cellular systems use the AMPS (analog) air interface. That case is inapposite here since the Commission auctioned and licensed the 700 MHz band under its policy of technology neutrality, which allows each individual licensee to choose the technology it deploys on the spectrum for which it holds a license. In that vein, the Petition also ignores the fact that licensees are free to change air interfaces and often do so, and a new air interface may not be backwards compatible. The requested relief would seemingly outlaw all existing devices on the 700 MHz band if the licensee of one 700 MHz paired commercial block deployed an air interface not supported by those devices. Such a result would be untenable and manifestly contrary to the public interest.

For all of these reasons, Qualcomm requests that the Commission dismiss the Petition forthwith so that all stakeholders can focus their efforts on bringing 700 MHz networks and devices to market as quickly and as broadly as possible without any lingering uncertainty over whether these efforts could be derailed by Commission action on the Petition.

## **II. The Equipment Does Not Exist to Support the Relief Requested in the Petition**

A grant of the Petition would require every device operating on any portion of the 700 MHz band to support all the paired blocks within the entire Upper and Lower 700 MHz bands. Even before January 2008, when the FCC began its auction of 700 MHz spectrum, since 2007, Qualcomm has been developing chipsets to support the Lower and Upper 700 MHz bands. “Qualcomm Announces Support for Wireless Services in 700 MHz,” Nov. 30, 2007, <http://www.qualcomm.com/news/releases/2007/11/30/qualcomm-announces-support-wireless-services-700-mhz>. Qualcomm’s development work has been, of course, based on existing Commission rules, which leave it to the marketplace to determine which parts of the Lower and Upper 700 MHz bands each chipset solution supports. Moreover, in particular, with respect to LTE, the years of work by Qualcomm’s development teams have already come to fruition. In November 2009, Qualcomm announced that it is sampling the wireless industry’s first multi-mode 3G/LTE chipsets. See “Qualcomm Now Sampling Industry’s First Dual-Carrier and Multi-Mode 3G/LTE Chipsets for Global Markets,” issued Nov. 12, 2009, available at <http://www.qualcomm.com/news/releases/2009/11/12/qualcomm-now-sampling-industry-s-first-dual-carrier-hspa-and-multi-mode-3g-lte>.

In the event that the Commission granted the relief requested in the Petition, device manufacturers using any of Qualcomm’s chipsets in devices to operate on the 700 MHz band would need to add additional so-called front end components, including filters, duplexers, power amplifiers, and switches. Qualcomm does not manufacture these front-end components, and several of the necessary front-end components are not available today from any vendor. Our analysis shows that it is impossible to fit these additional components into standard industry form factors, such as USB dongles already designed and planned for operation on 700 MHz. A grant of the requested relief would require significant redesigns of these USB dongles and other such devices currently planned to be sold for use on the 700 MHz band, and we are concerned about the size and potentially degraded performance of any such redesigned devices. As a result, a grant of the Petition would delay the availability of 700 MHz devices by an unspecified period of time and would drive up the costs of such devices by an unspecified amount. Such time delays and cost increases in bringing 700 MHz devices to market would certainly be detrimental to the American public.

Likewise, Qualcomm’s most advanced RF chipset, the RTR8600, can only support five 3G or 4G paths, only two of which can be lower 3G or 4G frequency bands. For this purpose, each 3GPP-designated band class is considered a separate band, and the low bands include any of the 700 MHz band classes as well as the US cellular (850 MHz) band. A grant of the Petition would require support for five low 3G or 4G paths in every RTR8600 chipset, whereas the chipset supports only two such low paths. Thus, the relief requested in the Petition cannot be supported by Qualcomm’s existing RTR8600 chipset, Qualcomm’s only RF chipset supporting the 700 MHz band.

Accordingly, once again, a grant of the Petition would derail years of expensive development work accomplished by Qualcomm on its existing 700 MHz RF solutions and would require Qualcomm to engage in substantial technical work to redesign a RF chip for the

700 MHz band to meet the Commission-imposed requirements. The cost and time to develop a new RF chip would be considerable, and new mobile broadband products would be delayed from coming to market in the meantime. Once again, the public interest would be harmed from the time delays and cost increases which would ensue from a grant of the Petition.

**III. The Relief Requested in the Petition Would Increase the Potential for Interference Within the Lower and Upper 700 MHz Bands**

A grant of the Petition would mandate sub-optimal solutions to avoid interference within the Upper and Lower 700 MHz bands. As Verizon Wireless has noted, there is the potential for interference within the Upper and Lower 700 MHz bands separate and apart from the relief requested in the Petition because there is almost no guard band between any of the individual frequency blocks in the Lower and Upper 700 MHz bands, and the duplex spacing and gap within the Lower and Upper 700 MHz bands is relatively narrow. This interference can be mitigated through the use of narrower filters in the duplexer(s), which is precisely the filters which will be used in conjunction with the Qualcomm chipsets now supporting parts of the Lower and Upper 700 MHz band.

However, a grant of the relief requested in the Petition would effectively mandate the use of wider filters within each device than would be used with the chipsets now coming to market. Wider filters would be necessary for 700 MHz devices if the Petition is granted because the devices would have to be capable of operating across the entire Lower and Upper 700 MHz bands within which the paired commercial blocks are located. Once again, it is not in the public interest for the Commission to grant the Petition, thereby increasing the potential for interference and diminishing the quality of mobile broadband service on these important frequency bands.

**IV. The Relief Requested in the Petition Ignores the Commission's Policy of Technology Neutrality and, if Granted, Would Lead To Irrational Results**

The Petition fails to consider the relief requested in light of the Commission's policy of technology neutrality and, instead, relies on a Commission decision adopted for the cellular band at a time when the Commission mandated that one and only one technology be deployed on the cellular band—AMPS. See Petition at Page 10, citing Cellular Communications Systems, 86 FCC 2d 469, 482 (1981). Of course, the Commission did not mandate any technology or technologies for operation on the 700 MHz band, and, instead, allocated the band in accordance with its policy of technology neutrality.

Technology neutrality in the 700 MHz band has already allowed Qualcomm to deploy its FLO mobile broadcast technology on the Lower 700 MHz D block. In March 2007, Qualcomm's FLO TV subsidiary began operating its FLO mobile broadcast network on that block, and FLO TV's network now covers over 200 million people. Since March 2007, Verizon Wireless and AT&T have sold, and are selling, FLO-enabled cell phones to their subscribers. Beginning last year, FLO TV itself has sold, and is selling, FLO-only personal

mobile television devices, and FLO TV, in conjunction with Audiovox, is selling FLO-based rear seat solutions for installation in cars.

A grant of the Petition would outlaw these FLO devices since they are 700 MHz mobile equipment, but they are nominally capable of operating on only one of the frequency blocks in the 700 MHz band and, in particular, none of the paired 700 MHz blocks. That result would be irrational because while the devices only operate on one 700 MHz block, that is the only block on which FLO is currently deployed. And, while the FLO devices are 700 MHz equipment, there is no reason why they need be capable of operating on the 700 MHz paired blocks. Moreover, the PTV devices are intended to be receive-only mobile broadcast devices. The Petition would require these devices to support unicast technologies to be deployed on the 700 MHz paired blocks, which would be useless in the devices. The Commission should not mandate that every wireless device support every conceivable technology if the device is to be deployed on the 700 MHz band, and yet, that is the mandate sought in the Petition.

Finally, as noted supra, the Petition ignores the facts that the Commission's policy of technology allows licensees to change air interfaces, and not all air interfaces are backwards compatible. If the Commission were to grant the requested relief, once a licensee of a paired 700 MHz spectrum block in any geographic area changed the air interface it uses to one not supported in existing devices, those devices would become unlawful since those devices would no longer be capable of operating on the paired Lower and Upper 700 MHz spectrum blocks. Such a result would be completely contrary to the public interest and should be rejected out of hand.

## V. Conclusion

For all of these reasons, Qualcomm requests that the Commission dismiss the Petition forthwith and allow all stakeholders to proceed with their efforts to bring 700 MHz solutions to market as quickly and as broadly as possible.

Respectfully submitted,

/s/ Dean R. Brenner

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