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Joseph P. Marx
Assistant Vice President
Federal Regulatory
1120 20th Street, N.W., Suite 1000
Washington, DC 20036

T: 202-457-2107
F: 202-289-3699

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May 28, 2010

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Ex Parte

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

MAY 28 2010

Federal Communications Commission
Office of the Secretary

Re: In the Matter of Service Rules for the 698-746 747-762 and 777-792 MHz Bands, *WT Docket No. 06-150*; In the Matter of Implementing a nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, *PS Docket No. 06-229*; In the matter of a National Broadband Plan for Our Future, *GN Docket No. 09-51*; 700 MHz Mobile Equipment Capability, *RM Docket, No. 11592*

Dear Ms. Dortch:

On May 27, 2010 Brian Benison, David Shively, Robert Vitanza and I, on behalf of AT&T Services, Inc., met with Won Kim, Saurbh Chhabra, Jennifer Salhus, Nese Guendelsberger, Jordan Usdan, Matthew White, and Tom Peters of the Wireless Telecommunications Bureau and with Walter Johnston of the Office of Engineering and Technology. During the meeting, AT&T discussed the 700MHz Band Plan and the issues raised by the Wireless Strategy Band Analysis that was filed by MetroPCS Communications, Sprint, et. al. A copy of AT&T's presentation is filed with this letter.

Pursuant to the Commission's rules, a copy of this notice is being filed electronically in the above-referenced docket. If you require any additional information, please feel free to contact me.

Sincerely,

/s/ Joseph P. Marx
Assistant Vice President, AT&T Services Inc.

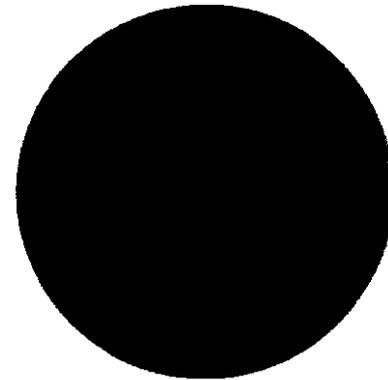
Attachment
cc: (via e-mail)
Won Kim
Saurbh Chhabra
Jennifer Salhus
Nese Guendelsberger
Jordan Usdan

Matthew White
Tom Peters
Walter Johnston

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Impacts of the 700 MHz Proceeding

May 27th, 2010



Overview

700MHz Summary

3GPP Standards Process

Device Limitations

Network Limitations

What problem is being solved?

Auction Integrity



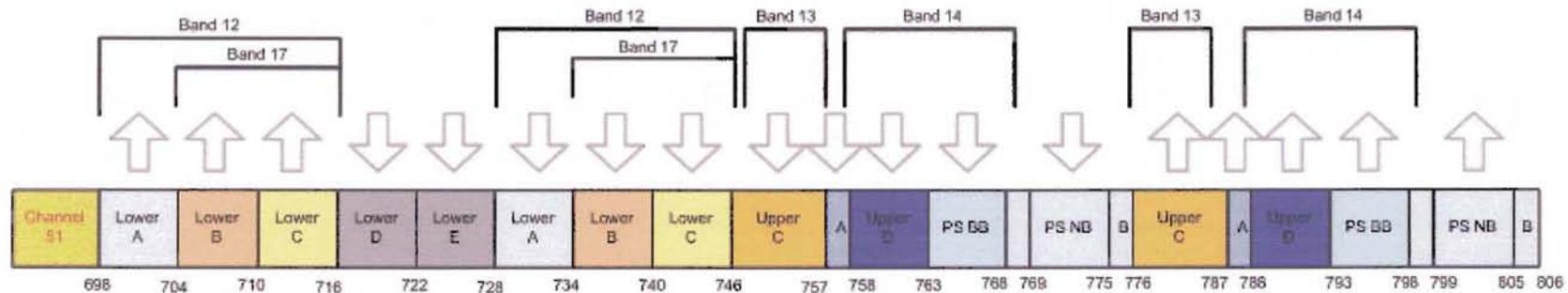
AT&T and the 700 MHz Band

Since AT&T's significant investment in the 700 MHz spectrum, it has taken several steps to deploy new services to customers in this band including:

- Working with domestic and international standards bodies to facilitate the provision of equipment
- Undertaken network planning and engineering to ensure compliance with the FCC's aggressive build out requirements
- Worked with vendors to test and approve equipment for the network
- Conducted vendor trials in 2009 and market trials are ongoing in 2010
- Selected vendors and currently testing a commercial handset



700 MHz Spectrum



The diagram above shows the 700MHz spectrum plan as defined by the FCC and the band plan as defined by 3GPP

- In the Lower 700MHz Band, there are 3 paired blocks forming the Lower A, B, and C blocks (6 + 6 MHz) and 2 unpaired blocks D & E (6 MHz)
- In the Upper 700MHz Band there are 6 paired blocks forming the Upper C (11 + 11 MHz), Upper D (5 + 5 MHz), Upper A & B (1 + 1 MHz), Public Safety Broadband (5 + 5 MHz), and Public Safety narrowband (6 + 6 MHz) plus a 1 + 1 MHz guard band between the PSBB and PSNB

The arrows show the 3GPP recommended device transmit and receive directions (duplex direction)

- Up arrows denote device transmit (Up-Link)
- Down arrows denote device receive (Down-Link)

The FCC rules for flexible use allow

- For any technology to be used in the bands that were auctioned
- Differing duplex directions from those recommended by 3GPP
- Transmission at up to 50kW ERP in Lower C, D, & E blocks

As the bands are envisioned in the Lower 700MHz band, there is

- Significant potential for interference in the Lower A band from DTV Channel 51 (operating at 1MW) and to DTVs receiving channel 51 from band A devices
- Potential interference from Lower E block (and to a lesser degree D block because of separation) that can impact devices receiving on nearby A, B, and C blocks)



700 MHz Summary

Because of the co-existence with high power broadcaster services in the D & E blocks, 700MHz devices must have tighter filters than any other wireless bands defined in the US

- Band 17 was defined in the 3GPP Standards (open process) and driven by the need to:
 - Protect the mobile receiver from nearby ATSC broadcasting
 - Protect the mobile receiver from interference due to MediaFLO, especially in the E-Block
 - Protect the mobile receiver from the inter-modulation between ATSC and MediaFLO
 - Protect DTVs from interference from mobiles operating on in blocks B & C where spatial separation between the handset and DTV is uncontrolled
- Band 17 duplexers in the handset can provide better performance in the Down-Link (with the 6MHz A Band separation) for the D & E blocks
- The 6MHz A block separation in the Uplink direction provides adequate separation for handsets interfering with Digital TVs receiving signals on Channel 51

Band 12 devices will suffer from these interference issues

- Duplexers in band 12 handsets would not provide adequate filtering in the Down-Link from the E-Block since there is no natural separation
- In the Uplink direction, band 12 handsets near digital TVs operating on Channel 51 would likely create interference since televisions do not normally include this type of filtering

The methods suggested (base station location, etc.) by the alliance for dealing with these problems are inadequate to address the interference problems highlighted above (covered on Slide 8)



700 MHz Summary

While the Alliance is asking for devices that support all of the 700MHz paired spectrum bands, their comments (and the earlier filing from Qualcomm) make it clear that state-of-the-art chipsets can support only 2 frequency bands for 3G and 4G technologies in Lower Frequencies

- Since most national carriers need to use alternate frequencies for broadband roaming (both nationally and internationally), this would not allow independent/rational business decisions
- The limitations in the chipsets may change but it is likely to be several years before vendors have chipsets that support more than 2 frequencies
- Use of external switches to add more bands will compromise overall performance

The NPSTC report makes it very clear that NPSTC will require public safety devices to support Band 14 (including both the D block and PS BB) but the other bands in 700 MHz are to be considered optional.

Mandating that all 700 MHz devices **MUST** support all of the different bands in 700 MHz will mean that every device is including functionality that may never be used in practice (due to differences in technology, roaming agreements, etc.)

- This serves only to increase the cost for every consumer and for public safety users for no real benefit



3GPP Standards Process

The 3GPP Adopted the 700MHz band classes in an open process in which the alliance's members could have participated

The band classes were crafted through an open process that was a response to the engineering and manufacturing constraints

- The definition of band class 17 (separate from 12) was to address concerns about interference from television broadcast in channel 51 and high power operations allowed in Lower D & E 700MHz spectrum
- In general, interference concerns can be mitigated through the use of narrower and more selective filters
- The alliance approach would require the use of wider duplex filters making for more complex and expensive solutions

The FCC has historically recognized the need the marketplace and technical experts to establish handset requirements



Device Limitations

Adopting the “all 700MHz frequency” mandate would unreasonably limit the ability of the device to support national and international roaming (contrary to established policy)

- The state of the art chipsets allow a limited number of bands that can be supported in a device (see Motorola Ex Parte)
- Chipsets limit number of 3G/4G bands that can be supported below Lower Frequencies to 2 bands
- In order to support all 700MHz bands, it would limit the device’s ability to support alternate bands for 3G (850MHz, 1.9 GHz, and AWS Bands)
- There are also other wireless technologies that need to be supported such as GPS, WLAN, and Bluetooth

Creating the New Upper Band (combining band 13 and 14) may lead to technical issues in the handset because of insufficient duplex gap

- Detailed Out of Band Emissions analysis is required to understand if devices can meet the FCC emission mask to public safety and GPS bands
- The Upper 700MHz band is unique in that the second harmonic of the 787.5MHz has potential to create interference with GPS, which have very strict emission masks imposed by the FCC
- The second harmonic is important to the Upper A & D block since 787.5MHz falls into this spectrum and co-existence between devices with this band and internal GPS receivers will be particularly difficult

Even if it were technically feasible to incorporate all of the bands into a single device, it would require trade-offs that include

- Less functionality
- A larger/less desirable form factor (while consumers are seeking smaller slimmer devices)
- Shorter battery life
- Additional interference problems



Network Limitations

The alliance suggests several methods to deal with base station to base station interference from channel 51 transmission as well as high powered D and E Blocks

- Base station location selection
- Antenna downtilt
- Sector orientation
- Base Station Filtering

While these methods are currently used to mitigate interference

- Channel 51 allows up to 1 Megawatt of power and the C, D, & E block allows 50kW of power
- These differing power levels force different solutions which may require different base station locations to solve the interference issues independently leading to
 - Significantly more base stations (higher capital investment)
 - Potential coverage holes that can't be solved because of zoning challenges
- Forces B & C block carriers to face more than twice the anticipated coordination since they need to build to accommodate both Channel 51, and 700 MHz D & E blocks
 - These are not static coordination efforts since D & E block builds can change over time
 - AT&T mobiles with band 12 duplexers will experience downlink interference from the high power transmitters in the E block that will result in raising the overall noise floor, lowering system throughput and reducing the overall capacity of the system.



What problem is being solved?

There is no Regulatory Problem that needs to be solved and this issue should be left for the market to fix

Adopting the "all 700MHz frequency" mandate does not solve the problem of roaming with unique devices

- Every carrier will need to have unique devices that support the "fall back" technology they have in their underlying networks (HSPA/GSM and EV-DO/CDMA)
- Every carrier will need to make decisions about how the handsets will decide to handoff when they reach the edge of their LTE coverage
 - In AT&T Case, Lower B & C – we would likely fallback to HSPA on our network at 850 versus roaming to the Lower A band
 - In the case of a Lower A band carrier reaching the edge of the network, they would need to ability to control the roaming decisions (Lower B & C?, Upper C?, Upper D?, HSPA?, CDMA? EV-DO?)
 - Therefore, there wouldn't be a common device capable of supporting the disparate carrier requirements
- The same issue would exist with a public safety handset supporting the PSBB band when they reach a hole in the network. Where do they roam when there is no available LTE coverage?



Auction Integrity

The FCC outlined the interference issues prior to the 700 MHz auction

- Bidders in the A-Block (and those not involved in the auction at all) are attempting to introduce new rules that apply to the auction after the fact
- These rules will burden non A-Block winners with interference they initially sought to avoid by paying a premium over the A-Block prices

Adopting the “all 700MHz frequency” mandate would conflict with at least 3 FCC Policies

- Discouraging and delaying the provision of advanced wireless broadband
- Conflicting with the FCC policy not to intervene in technical specifications on wireless devices
- Undermining the FCC goal to promote third party development on the open 700MHz C-Block Spectrum

The FCC Flexible Use Approach goes back more than 10 years and allows carriers

- To use different technologies in different bands
- To use different duplexing approaches according to their business plans
- Approval of the petition would essentially designate a single technology instead of the flexible use approach for spectrum



Policy Impacts of the Proposed Mandate

Penalizes carriers who have proactively invested in development and deployment of 700 MHz spectrum

Delays deployments by carriers who have invested and taken significant steps to provide services in the 700 MHz band

Inconsistent with the FCC Flexible Use Approach

At best, consumers would be forced to choose among larger and less energy efficient devices with poorer overall performance

