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VIA ELECTRONIC FILING

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

**Re: *Ex Parte* Notice
WT Docket Nos. 07-195 and 04-356
Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band**

Dear Ms. Dortch:

Much has been made in this proceeding of the report issued earlier this year by the Office of Communications of the United Kingdom (“Ofcom”) regarding potential interference between Frequency Division Duplexing (“FDD”) and Time Division Duplexing (“TDD”) terminals in the European 2.6 GHz band.^{1/} M2Z in particular has claimed that this report proves that these two incompatible technologies can coexist in adjacent AWS-1 and AWS-3 bands. As we demonstrated in our reply comments^{2/} and as CTIA showed in a recent *ex parte* filing,^{3/} however,

^{1/} Office of Communications of the United Kingdom, On the Impact of Interference from TDD Terminal Stations to FDD Terminal Stations in the 2.6 GHz Band (Apr. 21, 2008) (“Ofcom Report”).

^{2/} T-Mobile Further Notice Reply Comments at 26-29. T-Mobile showed that (1) Ofcom assumes a distribution of received signal power (the strength of the desired signal into the victim receiver) which is unrealistically high for the AWS scenario; (2) Ofcom’s analysis evaluated TDD interference into FDD data terminals and focused on the impact of interference to “bursty” data systems that can tolerate interference better than voice systems, whereas AWS-3 TDD terminals would be sending interfering signals into AWS-1 voice handsets; (3) Ofcom did not assess the possible impacts to FDD system capacity resulting from TDD interference; (4) Ofcom assumed the use of a guardband between TDD and FDD operations; (5) Ofcom’s analysis did not adequately address the obvious scenario of in-home use, especially as it is and will be deployed in the U.S. market; and (6) Ofcom concluded that significant mobile-to-mobile interference will exist and could be “an issue” if TDD is deployed with macrocells.

^{3/} See Letter from Christopher Guttman-McCabe, CTIA, to Marlene H. Dortch, Secretary, FCC, ET Docket Nos. 04-186 and 02-380; WT Docket Nos. 04-356 and 07-195, at 2-6 (filed Oct. 1, 2008). CTIA demonstrated that (1) Ofcom actually found significant interference between adjacent FDD and TDD operations; (2) Ofcom’s assumptions are not applicable to the United States where total received power is lower, circuit-switched technologies are used for existing PCS and AWS-1 voice systems, in-home use of

Ofcom's analysis was based on assumptions that render it of little use to evaluating the harmful interference that would occur under the FCC's proposed rules for the AWS-3 band.

Nonetheless, M2Z persists in putting forward the Ofcom analysis as relevant to the Commission's deliberations.^{4/} It is not. Ofcom did not assume the technical standards and conditions under consideration in this proceeding, and its statistical modeling has been criticized as "a situation which is very far removed from any real life scenario."^{5/} T-Mobile recently filed a simulation performed by Optimi Corp. that modeled the technical standards and conditions actually under consideration in *this* proceeding for *this* spectrum band and found a high likelihood that AWS-1 consumers will experience harmful interference if the Commission adopts its proposed rules allowing mobile TDD devices to operate in the AWS-3 band.^{6/} Indeed, the

AWS-3 devices is likely to be widespread, and FDD cells are not limited to a 1000 meter radius; and (3) Ofcom acted prospectively, enabling the auction process to dictate the outcome of FDD/TDD adjacency.

^{4/} M2Z Further Notice Reply Comments at 18; Letter from John Muleta, M2Z Networks, to Michael J. Copps, Jonathan S. Adelstein, Deborah Taylor Tate, and Robert M. McDowell, Commissioners, FCC, WT Docket Nos. 07-195 and 04-356, at 1-2 (filed Aug. 12, 2008); Letter from Uzoma Onyeije, M2Z Networks, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356, at 1 (filed Aug. 14, 2008); Letter from Uzoma Onyeije, M2Z Networks, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356, at 11-13 (filed Sept. 23, 2008).

^{5/} Ericsson, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 2 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/Ericsson.pdf>; UMTS Forum, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 3 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/UMTS.pdf> (noting that "Ofcom analysis on the blocking effect assumed a 15 MHz carrier separation between the FDD victim receiver . . . which will never be the case"); Nokia, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 3 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/Nokia> ("The study on adjacent channel interference has omitted the most serious scenario of interference altogether — namely mobile to mobile."); T-Mobile International, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 2 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/T-Mobile.pdf>.

^{6/} Letter from Thomas Sgrue, T-Mobile-USA, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356 (filed Sept. 30, 2008) ("T-Mobile September 30 Ex Parte"). For instance, Ofcom's hypothetical hotspot is a 25-meter radius about an FDD terminal, within which interfering TDD terminals are distributed uniformly. Ofcom Report at 10-11 ¶¶ 4.8-4.10. Hotspots, however, are rarely characterized by a uniform distribution of users. In the U.S., the characteristics of hot spots can vary as changes in time of day will shift the concentration of traffic between office areas, outdoor spaces, and home usage. Optimi was able to take these factors into account by using different sets of users, traffic patterns, and random locations in the multiple scenarios evaluated in its Monte Carlo analysis, including how users are concentrated differently in office, home, and outdoor environments. T-Mobile September 30 Ex Parte, Attachment - Optimi Corp., Analysis on the Effects of the AWS-3 to AWS-1 Mobile to Mobile Interference at 7, 22-24.

Ofcom methodology itself would show harmful interference if it were applied to the technical standards and conditions of mobile deployments in the U.S.

M2Z's reliance on the Ofcom report suffers from other flaws. For example, contrary to M2Z's assertion,^{7/} Ofcom did not conclude that unfettered TDD operations could "easily" co-exist with FDD services everywhere. Rather, Ofcom's analysis was specific to the European 2500-2690 MHz band and the technical rules proposed for that band. These rules require a separation of 5 MHz between the edges of TDD spectrum blocks and FDD spectrum blocks.^{8/} The rules further specify that the 5 MHz can be left unused as a guardband or be used for "restricted" operations.^{9/} The Ofcom study confirms that, for the conditions specific to its simulations, at least a 5 MHz guardband is necessary if TDD is deployed with macrocells (cell range of 1000 meters) and concludes that TDD usage within the guardband could only be possible with TDD picocell deployments (cell range of 100 meters).^{10/} Picocells are dramatically smaller than macrocells and therefore transmit at a far lower power, producing markedly reduced mobile-to-mobile interference. Ofcom cautions, however, that even picocell operations within the guardband create a risk of interference.^{11/}

Significantly, the very scenario that Ofcom concluded would create harmful interference — macrocellular TDD operations in spectrum immediately adjacent to an FDD band — is exactly what M2Z proposes and what the Commission's current proposals would allow. The proposed rules do not include a guardband and do not limit the AWS-3 licensee to picocell operations. M2Z conveniently and consistently ignores these critical distinctions.

^{7/} M2Z Further Notice Reply Comments, Technical Appendices at 9.

^{8/} Office Journal of the European Union, Commission Decision of 13 June 2008 on the Harmonisation of the 2 500-2 690 MHz Frequency Band for Terrestrial Systems Capable of Providing Electronic Communications Services in the Community (2008/477/EC) ("Commission Decision of 13 June 2008").

^{9/} CEPT Report 19, Report from CEPT to the European Commission in Response to the Mandate to Develop Least Restrictive Technical Conditions for Frequency Bands Addressed in the Context of WAPECS, Appendix IV: Block Edge Masks for 2.6 GHz Band, at 69-77 (Dec. 21, 2007) ("CEPT Report"). As CEPT notes, "The development of the block edge masks for the 2.6 GHz band has been done on the basis that a 5 MHz restricted block is necessary between TDD and FDD UL blocks and between one TDD block and another." *Id.* at 74.

^{10/} Ofcom Report at 18 ¶ 5.3 (stating that "there is a risk of significant 1st adjacent-block interference from TDD terminal stations towards FDD terminal stations, where the TDD terminal stations are served by high-power macrocellular base stations, and where there is a high density of TDD terminal stations operating in the spatial vicinity of the FDD terminal stations").

^{11/} Ofcom Report at 19 ¶ 5.8; Commission Decision of 13 June 2008 ¶ 8; Mason Communications Ltd, Ofcom 2500-2690 MHz, 2010-2025 MHz and 2290-2302 MHz Spectrum Awards - Engineering Study (Phase 2), at 32-34 ¶ 5.1.1 & Table 5.1 (Nov. 2006).

The incompatibility of the Ofcom study with on-the-ground concerns for AWS operations in the United States is further compounded by the fact that Ofcom was specifically analyzing a European TDD band plan that consists of 18 x 5 MHz blocks within the 2500-2650 MHz band. The Ofcom simulation assumes that a TDD user is equally likely (*i.e.*, a uniform distribution) to use any of the 18 x 5 MHz TDD blocks. This band plan means that the predicted TDD user density is 1/720 users per square meter per 5 MHz block using a TDD device at any one time.^{12/} Density and the resulting possibility of harmful interference are much different under those circumstances than in the case of the same density of users using a single 20 or 25 MHz TDD band like AWS-3. If the Ofcom assumptions and methodology were applied to that much smaller of a band, the likelihood of harmful interference would be much greater.

M2Z offers nothing to explain how Ofcom's results could be applied to the AWS-3 band given these differences. Tellingly, the far more relevant empirical tests of AWS-3 devices operating at the technical limits proposed in the *Further Notice* demonstrate a high likelihood of harmful interference to AWS-1 devices 10 or 15 MHz away from the AWS-3 band.^{13/}

In the final analysis, the debate over the deployment of FDD and TDD devices in other countries is a distraction from the real issue in this proceeding: the adoption of technical rules for the deployment of AWS-3 *in this country* that ensure that wireless broadband subscribers can continue to receive service in the AWS-1 band without the risk of harmful interference and that service providers in that band continue to invest the necessary billions of dollars in real networks in order to provide real competitive choices. We respectfully urge the Commission not to take its eye off the ball.

Sincerely,

/s/

Thomas J. Sugrue
Vice President, Government Affairs

cc: Charles Mathias
Bruce L. Gottlieb
Renee R. Crittendon
Wayne Leighton
Angela E. Giancarlo
Julius Knapp
James Schlichting

^{12/} Ofcom Report at 11 ¶ 4.11.

^{13/} T-Mobile Further Notice Comments at 12-14; *id.* Exhibit 1 - T-Mobile Test Results at 22-23, Exhibit 2 - Ray Declaration at 21-24.