

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

T-Mobile USA, Inc., AT&T Services, Inc., Cellco Partnership d/b/a Verizon
Wireless, Nokia of America Corporation, Ericsson Inc.
Petitioners

v.

Wireless Alliance, LLC
Patent Owner

Case IPR2024-00608
Patent 9,565,662

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NOS. 9,565,662**

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Inter Partes Review of U.S. Patent No. 9,565,662

EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 9,565,662 (“’662 Patent”)
1002	U.S. Patent No. 9,144,106 (“’106 Patent”)
1003	Prosecution History for U.S. Patent 9,565,662
1004	Prosecution History for U.S. Patent 9,144,106
1005	U.S. Patent Publication No. 2011/0026495A1 (“Lee”)
1006	U.S. Patent Publication No. 2011/0103326A1 (“Kim”)
1007	U.S. Provisional Application No. 61/256,294 (“Kim 294 Provisional”)
1008	U.S. Provisional Application No. 61/257,427 (“Kim 427 Provisional”)
1009	Expert Declaration of Dr. Joseph Camp
1010	Harri Holma & Antti Toskala, “LTE for UMTS – OFDMA and SC-FDMA Based Radio Access” (Wiley 2009) (“Holma”)
1011	Change Request R2-103427, Third Generation Partnership Process
1012	Certified Translation of Korean Pat. App. No. 10-2010-0077880 (Aug. 12, 2010)
1013	Docket Control Order in <i>Wireless Alliance, LLC v. AT&T Mobility LLC, et al.</i> No. 2:23-cv-00095-RWS-RSP (E.D. Tex.) (Dkt. No. 29)
1014	Katherine K. Vidal, <i>Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation</i> (June 21, 2022)
1015	G. Yuan, X. Zhang, W. Wang and Y. Yang, “Carrier aggregation for LTE-advanced mobile communication systems,” in <i>IEEE Communications Magazine</i> , vol. 48, no. 2, pp. 88-93, February 2010, doi: 10.1109/MCOM.2010.5402669.

LISTING OF CHALLENGED CLAIMS

Elem.	Claim Language
1.pre	A carrier management method of a base station for use in a carrier aggregation environment, comprising:
1.a	transmitting a deactivation message for a secondary carrier to a terminal;
1.b	changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message; and
1.c	stopping downlink (DL) data transmission of the secondary carrier and initializing uplink (UL) and DL buffers associated with the secondary carrier after transmitting the deactivation message.
2	The carrier management method of claim 1, wherein the predetermined time is a value predefined to make state information that is managed by the base station consistent with state information that is managed by the terminal for the secondary carrier.
3	The carrier management method of claim 1, further comprising: receiving a reception success message for the deactivation message from the terminal after transmitting the deactivation message, wherein the changing of the secondary carrier to the deactivation state includes changing, by the base station, the secondary carrier to the deactivation state after a predetermined time from an arrival time of the reception success message.
4	The carrier management method of claim 1, further comprising: immediately stopping, by the base station, data transmission and retransmission using the secondary carrier immediately after transmitting the deactivation message.

***Inter Partes* Review of U.S. Patent No. 9,565,662**

T-Mobile USA, Inc., AT&T Services, Inc., Cellco Partnership d/b/a Verizon Wireless, Nokia of America Corporation, and Ericsson Inc., (“Petitioners”) petition for *inter partes review* of Claims 1-4 of U.S. Patent No. 9,565,662 (“’662 Patent”) (collectively, “Challenged Claims”).

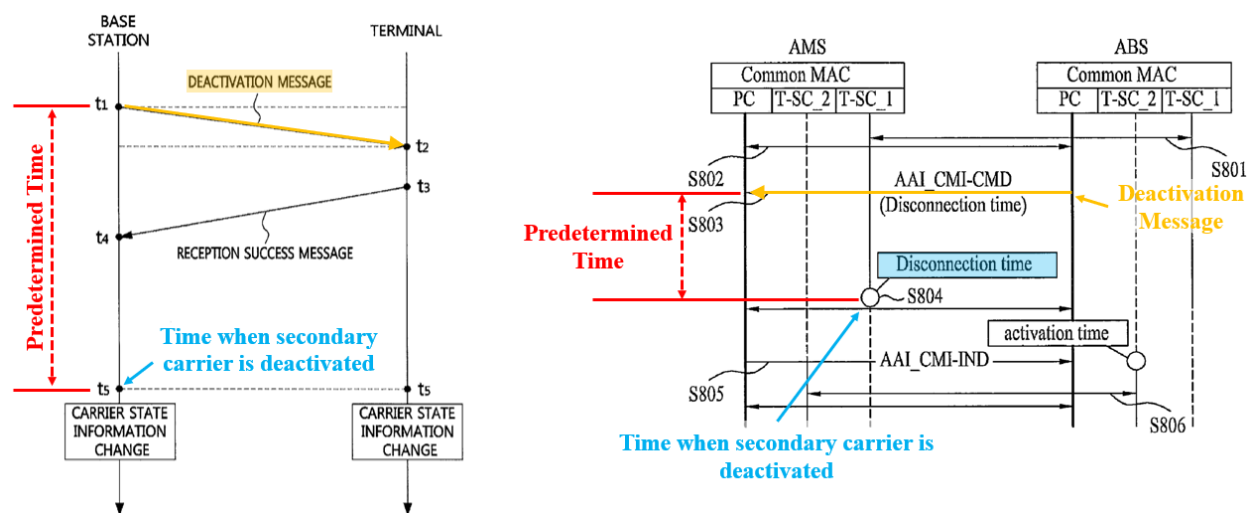
I. INTRODUCTION

The Challenged Claims of the ’662 Patent are directed to a method for a base station to deactivate secondary carriers used in carrier aggregation. Carrier aggregation is a technique that was well-known prior to the ’662 Patent that allowed mobile devices to communicate with a base station using more than one frequency band, often referred to as a “carrier.” Typically, a mobile device was assigned a primary carrier and could be assigned one or more secondary carriers depending on need.

The focus of the Challenged Claims is a specific method for deactivating a secondary carrier, whereby a base station transmits a deactivation message and then deactivates the secondary carrier “based on a predetermined time” from said transmission. The Challenged Claims further require that, after deactivation, the uplink and downlink buffers for said secondary carrier are initialized. According to the Challenged Claims the goal of the alleged invention is to ensure that the base stations and the terminal (*e.g.*, a wireless device like a phone) share consistent carrier activation states.

Because carrier aggregation had already been developed, the prior art is full of examples of how to activate and deactivate secondary carriers, including patents filed by LG Electronics. For example, Lee is assigned to LG Electronics, and directed to several methods for activating and deactivating primary and secondary carriers. Lee discloses the same concept claimed in the '662 Patent of sending a deactivation message, and then deactivating the carrier after some predetermined time (referred to in Lee as the “disconnection time”). For example, a comparison of Figure 8 from Lee and Figure 10 from the '662 Patent reveals how Lee discloses the same timing concepts related to disconnection of secondary carriers as the '662 Patent.

Ex. 1001 ('662 Patent) Fig. 10 (left) & Ex. 1005 (Lee) at Fig. 8 (right).



Similarly, Kim, which is also assigned to LG Electronics, discloses the steps that should be taken after a secondary carrier is deactivated. Specifically, like the

'662 Patent, Kim discloses that after deactivation of a secondary carrier the HARQ buffer should be initialized.

Thus, Lee in combination with Kim renders obvious the Challenged Claims.

II. MANDATORY NOTICES

REAL PARTIES IN INTEREST: The real parties in interest are T-Mobile USA, Inc., AT&T Services, Inc., AT&T Corp., AT&T Mobility LLC, Cellco Partnership d/b/a Verizon Wireless, Nokia of America Corporation, Ericsson Inc. 37 C.F.R. § 42.8(b)(1).¹

RELATED MATTERS:

Pursuant to 37 C.F.R. § 42.8(b)(2), Petitioners are aware of the following pending patent infringement lawsuits or related matters involving the '662 Patent:

- *Wireless Alliance, LLC v. AT&T Mobility LLC et al*, No. 2:23-cv-00095 (E.D. Tex.) filed March 7, 2023;

¹ Petitioners also acknowledge that each petitioner has a number of affiliates. No unnamed entity is funding, controlling, or otherwise has an opportunity to control or direct this Petition or Petitioner's participation in any resulting IPR. Petitioners are also not aware of any affiliate that would be barred from filing this Petition under 35 U.S.C. § 315(e).

***Inter Partes* Review of U.S. Patent No. 9,565,662**

- *Wireless Alliance, LLC v. T-Mobile US, Inc. et al*, No. 2:23-cv-00096 (E.D. Tex.) filed March 7, 2023; and
- *Wireless Alliance, LLC v. Verizon Communications, Inc. et al*, No. 2:23-cv-00097 (E.D. Tex.) filed March 7, 2023.

Petitioners are also concurrently filing an IPR on U.S. Patent No. 9,144,106 (Ex. 1002) which is the parent of the '662 Patent and bears nearly identical claims. *See* IPR2024-00607.

LEAD AND BACKUP COUNSEL: Petitioners provide the following designation and service information for lead and back-up counsel. 37 C.F.R. § 42.8(b)(3) and (b)(4).

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***Inter Partes* Review of U.S. Patent No. 9,565,662**

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SERVICE INFORMATION: Petitioners consent to electronic service by email at the email address: WA-Alston@alston.com

III. STANDING UNDER 37 C.F.R. §42.104(a)

Petitioners certify that the Challenged Claims are available for *inter partes* review. Petitioners also certify that it is not barred or estopped from requesting this *inter partes* review on the grounds identified herein. Neither Petitioners, nor any party in privity with Petitioners: (i) have filed a civil action challenging the validity of Claims 1-4 of the '662 Patent; (ii) have been served a complaint alleging infringement of the '662 Patent more than one year prior to the present date; or (iii) are estopped from challenging the claims on the grounds identified in the Petition. Claims 1-4 of the '662 Patent also have not been the subject of a prior IPR or a finally concluded district court litigation.

IV. STATEMENT OF RELIEF REQUESTED

Petitioners request *inter partes* review and cancellation of Challenged Claims 1-4 of the '662 Patent based on the detailed statements presented below.

V. PAYMENT OF FEES UNDER 37 C.F.R. § 42.103

Petitioners authorizes Account No. 16-0605 to be charged for any fee set forth in 37 C.F.R. § 42.15(a) and for any additional fees.

VI. IDENTIFICATION OF CHALLENGE

Petitioners request *inter partes* review on the below ground. Per 37 C.F.R. § 42.6(c), copies of the references are filed with this petition. In support of this ground, this petition is accompanied by a Declaration of Dr. Camp.

Ground	Claims	Basis for Ground
1	'662 Patent – Claims 1-4	Obvious in view of U.S. Patent App. Pub. No. 2011/0026495 to Lee et al. alone or in combination with U.S. Patent App. Pub. No. 2011/0103326 to Kim et al.

The '662 Patent is a continuation of U.S. Patent No. 9,144,106 (“’106 Patent”) (Ex. 1002) which is based on a PCT application filed on November 7, 2011, which claims priority to two Korean applications: (i) KR10-2010-0077880 filed on August 12, 2010, and (ii) KR10-2010-0110649 filed on November 8, 2010. Thus, the earliest possible priority date of the '662 Patent is August 12, 2010. However, as will be described below in Section IX, the '662 Patent is not rightfully entitled to claim priority to that date.

Each of the relied upon references is prior art to this patent regardless of how the priority date issue is resolved:

***Inter Partes* Review of U.S. Patent No. 9,565,662**

Lee (Ex.1005): U.S. Patent Publication No. 2011/0026495 to Lee et al. (“Lee”), titled “Method for Performing Carrier Management Procedure in a Multi-Carrier Supported Wideband Wireless Communication System and Apparatus for the Same,” was filed on July 27, 2010, and claims priority to seven provisional applications dating back to July 28, 2009. Lee published on February 3, 2011. Because Lee was filed on July 27, 2010, and published in 2011, Lee is prior art under at least 35 U.S.C. § 102(e) (pre-AIA) at least as early as July 27, 2010.

Kim (Ex. 1006): U.S. Patent Publication No. 2011/0103326 to Kim et al. (“Kim”), titled “Method of Operating User Equipment in Wireless Communication System Using a Plurality of Uplink Frequencies,” was filed on October 28, 2010, and claims priority to two provisional applications: Provisional Application No. 61/256,294 filed on October 29, 2009, and Provisional Application No. 61/257,427 filed on November 2, 2009. Kim published on May 5, 2011. Kim is prior art under at least 35 U.S.C. § 102(e) (pre-AIA) for two distinct reasons. First, Kim is entitled to claim priority to the provisional applications filed in 2009 and is thus prior art. Second, Kim is prior art even if its priority date is deemed to be October 28, 2010, because the Challenged Patent’s priority date is no earlier than November 8, 2010, not August 2010.

VII. BACKGROUND

A. Person of Ordinary Skill in the Art

A POSITA at the time of the alleged invention of the '662 Patent would have had at least a bachelor's degree in electrical engineering, computer engineering, computer science, physics, or the equivalent, and at least two years of experience working in the field. Ex. 1009, ¶32. Relevant working experience would include experience with telecommunications and networking, radio-access networking, and/or service provisioning in wireless networks. *Id.* More education can supplement practical experience and vice versa. *Id.*

B. Carrier Aggregation

Carrier aggregation is a technique that allows mobile devices to use more than one frequency band, often referred to as a “carrier,” at the same time. Ex. 1010 at 407-09; Ex. 1009, ¶34. For example, downlink carrier aggregation is a technique used to transmit data from a base station to a handset using multiple carriers. Ex. 1010 at 407-09; Ex. 1009, ¶¶34, 36. Prior to the '662 Patent, a POSITA would have been aware of carrier aggregation and its use in cellular communications. Ex. 1009, ¶35. For example, the textbook “LTE for UMTS – OFDMA and SC-FDMA Based Radio Access” by Harri Holma and Antti Toskala published in 2009 (“Holma”) (Ex. 1010) explains that carrier aggregation was first introduced in 3GPP Release 8 for High-Speed Packet Access (“HSPA”) networks in 2008. Ex. 1010 at 13-14, 408, Fig. 2.1; Ex. 1009, ¶35; *see also* Ex. 1010 at Figure 13.12. In 2010, prior to the filing

of the '662 Patent, the standards body developing LTE incorporated a form of carrier aggregation into the LTE-Advanced standard. *See* Ex. 1011; *see also* Ex. 1009, ¶38. This is shown for example by prior art technical contributions that were submitted as part of the standardization process for LTE-A. Ex. 1011; Ex. 1009, ¶38.

When using carrier aggregation, the component carriers can be referred to as a “primary” carrier or a “secondary” carrier. Ex. 1009, ¶39. A primary carrier is typically the carrier used by a mobile and base station for control and data signaling, while a secondary carrier is typically just used for increased data throughput. *Id.* at ¶39. Furthermore, in Time Division Duplex (“TDD”), the carriers are often shared in the uplink (“UL”) and downlink (“DL”) direction, meaning that the primary component carrier is used for both uplink and downlink as is the secondary component carrier. Ex. 1011 at 6 (“In typical TDD deployments, the number of CCs and the bandwidth of each CC in UL and DL is the same.”); *Id.* at ¶¶40-41.

C. HARQ Procedure

Hybrid Automatic Repeat reQuest² (“HARQ”) was a well-known procedure used in wireless communications to help ensure that data packets are received

² Sometimes this process is referred to as “Hybrid Adaptive Repeat and Request,” but it is the same process and is most often referred to simply as “HARQ.” *See* Ex. 1010 at xx; Ex. 1009, ¶42, Fn. 3.

correctly. Ex. 1010 at xx, 118–119; Ex. 1009, ¶42. For example, Holma (Ex. 1010) explains that, when using HARQ, a receiver transmits either a positive acknowledgement (“ACK”) or negative acknowledgement (“NACK”) message back to the transmitter to indicate whether a data packet was received correctly. Ex. 1010 at 118; Ex. 1009, ¶¶43–46. For example, if the receiver determines that it did not receive the data packet correctly, then the receiver would store the failed message in a buffer and send a NACK message back to the transmitter. Ex. 1010 at 118; Ex. 1009, ¶45. The transmitter can then resend the original data packet back to the receiver to allow the receiver a second chance at receiving the data packet correctly. Ex. 1010 at 118; Ex. 1009, ¶45. This process can be repeated until the receiver sends an ACK to indicate that the data was received correctly. Ex. 1010 at 118; Ex. 1009, ¶45. As described below, Lee and Kim disclose the use of HARQ for carrier aggregation.

D. Use of HARQ with Carrier Aggregation

When using carrier aggregation, an independent HARQ process can be utilized for each carrier. Ex. 1009, ¶47. For example, it was well known that, as multiple carriers are used, the number of HARQ processes may scale proportionally in both the uplink and downlink directions. *Id.* at ¶48; *see* Ex. 1011 at 8–10, Figs. 6-1, 6-2, 6.4-1, 6.4-2. This is particularly the case in TDD systems where “the number of [carriers] and the bandwidth of each [carrier] in UL and DL is the same.” Ex. 1011

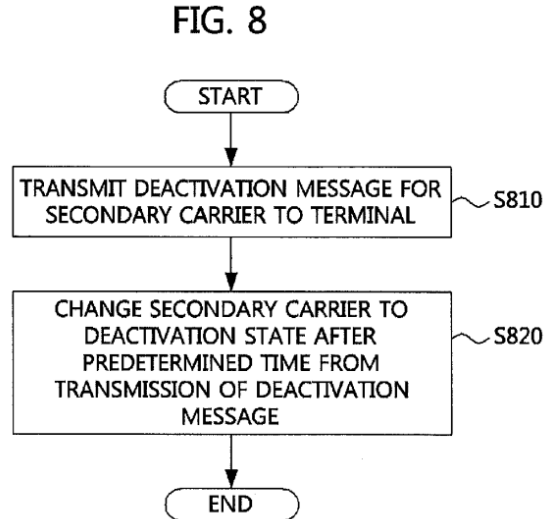
at 6; Ex. 1009, ¶49. As such, it was well known that component carriers could each have uplink and downlink buffers associated with them. Ex. 1009, ¶49. Thus, it was well known that a base station (or a UE) could have both uplink and downlink HARQ buffers and that these HARQ buffers—and their associated HARQ processes—could be treated similarly and initialized or wiped whenever a given component carrier is activated or deactivated. *Id.*

VIII. THE '662 PATENT

A. Overview

The '662 Patent is titled “Method for Carrier Management in a Carrier Aggregation Environment of a Mobile Communication System” and discloses “a carrier management method for use in a carrier aggregation environment of a mobile communication system.” Ex. 1001, Abstract. More specifically, the '662 Patent is directed to “a carrier management method of a base station capable of preventing inconsistency of carrier states that are managed by the base station and a terminal when a secondary carrier, which is configured and operated in a carrier aggregation environment, is deactivated, as a carrier state management method of the base station.” *Id.* at 2:9-15. Figure 8 below illustrates the steps involved in the deactivation method disclosed in the '662 Patent.

Ex. 1001, Fig. 8.

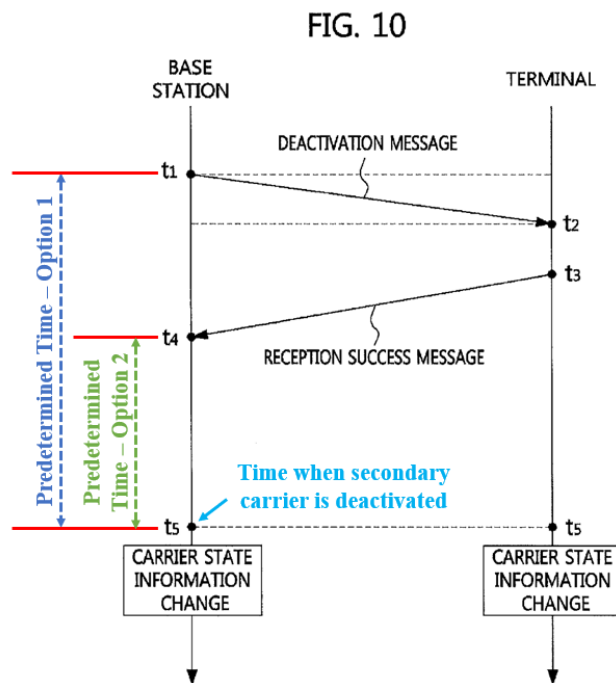


As shown in Figure 8, the disclosed process generally involves: (1) transmitting a deactivation message for a secondary carrier to a terminal and (2) deactivating said secondary carrier after a “predetermined time” from the transmission of said deactivation message. Ex. 1001, 2:26-33, Fig. 8 (above). Claim 1 of the ’662 Patent includes one additional step: “stopping downlink (DL) data transmission of the secondary carrier and initializing uplink (UL) and DL buffers associated with the secondary carrier after transmitting the deactivation message.” Ex. 1001, Cl. 1.

One aspect of the ’662 Patent is the “predetermined time” delay, which the ’662 Patent explains may be “a value predefined to make state information that is managed by the base station consistent with state information that is managed by the terminal for the secondary carrier.” Ex. 1001, 2:34-37; Ex. 1009, ¶54. The ’662

Patent explains that the “predetermined time” could start after one of two events: (1) transmission of the deactivation message or (2) reception of the success message for the deactivation message. Ex. 1001, 13:50-14:15, Fig. 10; Ex. 1009, ¶54. As shown below, Figure 10 illustrates these two potential options for the “predetermined time,” which Dr. Camp has illustrated with red lines and color-coded text.

Ex. 1001, Fig. 10 (Annotated) (Ex. 1009, ¶55).



B. Claim Construction

For the purpose of this proceeding, terms not expressly construed herein should be given their ordinary and customary meaning as of the filing date of the '662 Patent. 37 C.F.R. § 42.100(b); *see also Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*).

IX. THE '662 PATENT IS NOT ENTITLED TO ITS PURPORTED PRIORITY DATE

A. Introduction

The Challenged Claims are not entitled to a priority date of August 12, 2010. The '662 Patent is a continuation of the '106 Patent (Ex. 1002) and claims ultimate priority to two Korean Applications: (1) No. 10-2010-0077880 (the "'880 Application") filed August 12, 2010 (Ex. 1012), and (2) Korean Application No. 10-2010-0110649 (the "'649 Application"), filed November 8, 2010. Ex. 1001 at 1. As shown below, elements of the Challenged Claims are absent from the '880 Application and thus not entitled to the August 12, 2010, date. For example, the '880 Application fails to show that the inventor was in possession of the "changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message" limitation in Claim 1. Ex. 1009, ¶¶69-70, 73-77. The effective filing date of the Challenged Claims for the purposes of this Petition is thus no earlier than November 8, 2010, the filing date of the later filed '649 Application.³

³ Petitioners reserve the right to argue in District Court that the Challenged Claims are not entitled to any of their purported foreign priority claims.

B. Legal Standards

“In order to gain the benefit of the filing date of an earlier application under 35 U.S.C. § 120, each application in the chain leading back to the earlier application must comply with the written description requirement of 35 U.S.C. § 112.” *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1571 (Fed. Cir. 1997); *see also Dr. Reddy’s Labs. S.A. v. Indivior UK Ltd.*, IPR2019-00329, Paper No. 21, 19-20 (P.T.A.B. June 3, 2019) (applying § 112 case law in determining if the patent at issue was entitled to its earlier priority). To satisfy the written description requirement, the specification “must describe the invention sufficiently to convey to a person of skill in the art that the patentee had possession of the claimed invention at the time of the application, i.e., that the patentee invented what is claimed.” *Lizardtech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005).

C. The ’880 Application Fails to Show the Inventor Was in Possession of the “based on a predetermined time” Limitation

The ’880 Application provides no support for the “changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message” limitation in Claim 1 of the ’662 Patent. *See generally*, Ex. 1012; Ex. 1009, ¶¶73-77. The phrase “predetermined time” (or anything similar to it) does not appear in the ’880 Application. *See generally*, Ex. 1012; Ex. 1009,

¶75.⁴ On the other hand, the phrase “predetermined time” appears thirty-seven times in the written specification of the ’662 Patent. *See generally*, Ex. 1001; Ex. 1009, ¶75. Notably, Figures 8 and 10, which were described above and refer to the “predetermined time” concept, are not part of the ’880 Application and were only added in the PCT application that led to the ’662 Patent.

In contrast to the Challenged Claims and the ’662 Patent which require changing the deactivation state “based on a predetermined time” from the transmission of the deactivation message, the ’880 Application ties “stopping transmitting data” to a carrier to a determination that one of the downlink carriers is unstable. Ex. 1012 at 23 (“a method for managing a channel, including . . . determining a downlink carrier with an unstable wireless channel state among multi-carriers; and, based on the determination result, stopping transmitting data to that carrier.”); Ex. 1009, ¶74. The ’880 Application thus discloses monitoring various carriers and stopping transmissions on carriers that become unstable. Ex. 1012 at 13 (“In an example of the present invention, when a base station receives a wireless channel state report of a multi-carrier from a terminal, if the wireless channel state

⁴ The word “time” only appears nine times in the ’880 Application and in none of those circumstances refer to “changing the secondary carrier to a deactivation state” based on that time. See Ex. 1012 at ¶¶23, 24, 44, 47, 48; Ex. 1009, ¶75.

of some downlink carriers is bad, the base station instructs those carriers to stop the transmission.”); Ex. 1009, ¶74. The ’880 Application thus discloses an entirely different mechanism for deactivating carriers and stopping transmission on carriers. And timing or a “predetermined time” has nothing to do with it.

Thus, the Challenged Claims are not entitled to claim priority to August 12, 2010, the filing date of the ’880 Patent. Ex. 1009, ¶77.

X. THE PRIOR ART

A. U.S. Patent App. Pub. No. 2011/0026495 to Lee et al. (“Lee”) (Ex. 1005)

Lee is a published patent application that is assigned to LG Electronics Inc. and titled “Method for Performing Carrier Management Procedure in a Multi-Carrier Supported Wideband Wireless Communications System and Apparatus for the Same” and was filed on July 27, 2010. Ex. 1005, Cover. Lee discloses “a method and apparatus for performing a carrier management procedure in a broadband wireless communication system supporting multiple carriers.” Ex. 1005, ¶[0003].

More specifically, Lee describes methods for the activation and deactivation of carriers when using multi-carrier aggregation. Ex. 1005, ¶¶[0006]-[0007], Figs. 1A, 1B. Lee explains that carriers associated with multi-carrier aggregation can be “primary” or “secondary” carriers. *Id.*, ¶[0009]. A primary carrier “may allow the base station (BS) to exchange traffic and PHY/MAC control signaling (e.g. MAC control message) with the mobile station (MS).” *Id.* “A secondary carrier is an

additional carrier used by the mobile station (MS) for traffic and may be used according to a specific command by the base station (BS) and rules that are received through the primary carrier.” *Id.* (emphasis added).

Lee explains that a control message transmitted through a single carrier, like a primary carrier, can be used to control other carriers (*e.g.*, secondary carriers). Ex. 1005, ¶[0008]; *see also id.* at ¶[0073]; Ex. 1009, ¶¶80-82. Lee discloses examples of MAC control messages that could be used to control a secondary carrier, including “an Advanced Air Interface Carrier Management Command (AAI_CM-CMD) message.” Ex. 1005, ¶[0010]. Lee explains that “the AAI_CM-CMD message received from the base station (BS) [can control] primary carrier change, secondary carrier management (secondary carrier activation and/or deactivation), and carrier switching.” Ex. 1005, ¶[0010]. Lee explains that one possible use of the AAI_CM-CMD message is to “activate and/or deactivate the secondary carrier,” and “[t]he base station (BS) may transit the AAI_CM-CMD message through the primary carrier, wherein the AAI_CM-CMD message includes downlink/uplink (DL/UL) indication types (activation and deactivation), list of secondary carriers (logical carrier indexes), [etc.] . . .” Ex. 1005, ¶[0095]; *see also* ¶[0097], ¶[0104].

Lee explains that one of its goals is to help prevent faults which may negatively impact carrier management procedures, including “carrier change or carrier activation and/or deactivation.” Ex. 1005, ¶[0012]. To address this issue, Lee

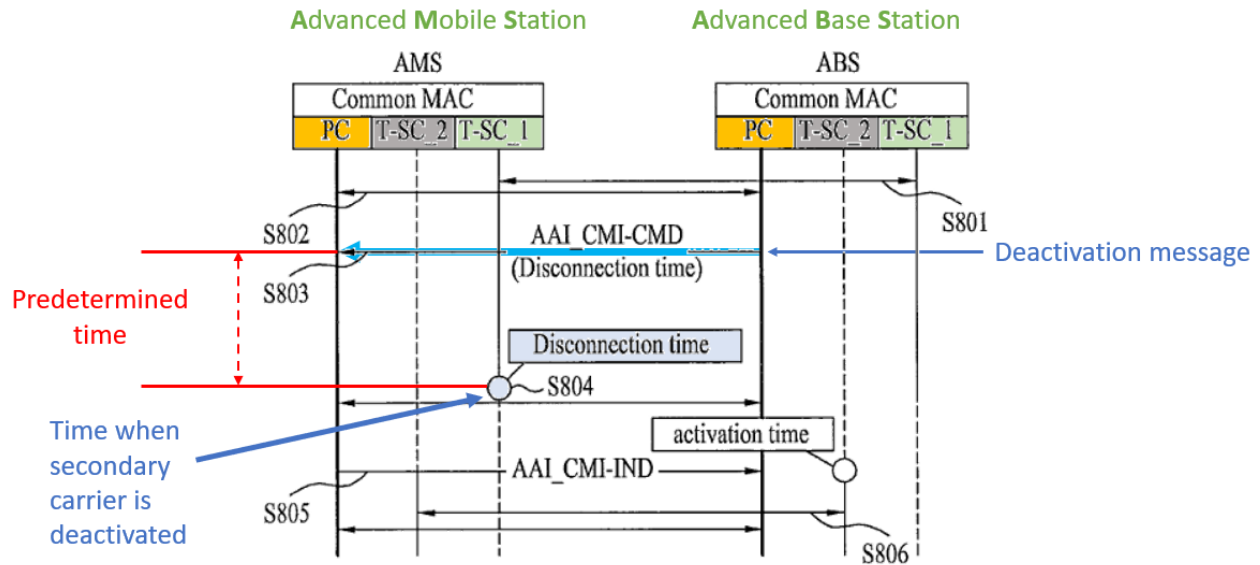
proposes utilizing, *inter alia*, “a carrier management command and an acknowledgement response to the carrier management command” and by establishing “correct time point(s)” for carrier activation and/or deactivation caused by the carrier management command. Ex. 1005, ¶[0013]. Lee explains that achieving the carrier state changes at “correct time point(s)” is accomplished by defining “action times” and “disconnection times.” Ex. 1005, ¶¶[0019], [0024]; *see also* Ex. 1005, ¶¶[0140], [0141], [0144]-[0147], Table 4-12, Fig. 7.

For example, Lee includes a section devoted to use of “Action Time and Disconnection Time in Carrier Management Procedure.” Ex. 1005, ¶[0140]. In this section, Lee describes procedures for primary and secondary carrier management. *See, e.g.*, Ex. 1005, ¶¶[0142], [0153]. For example, in the case of primary carrier management, Lee describes that it is possible to deactivate the serving primary carrier at the action time (*i.e.*, the time when the carrier change should take place), which is included the AAI_CM-CMD message. ¶[0142]. In that case, the action time and disconnection time would be the same. Ex. 1005, ¶[0146].

As another example, in the context of secondary carrier management, Lee explains that the deactivation time of a secondary can be defined “in relation to the AAI_CM-CMD message,” and Lee provides several methods for defining the disconnection time. Ex. 1005, ¶¶[0153]-¶[0157]. Figure 8 from Lee illustrates an example where a specific disconnection time is used as part of the secondary carrier

deactivation. Ex. 1005, ¶[0159]. The following is annotated version of Figure 8 that illustrates the use of the disconnection time (shown in blue).

Ex. 1005 (Lee), Fig. 8 (Annotated).

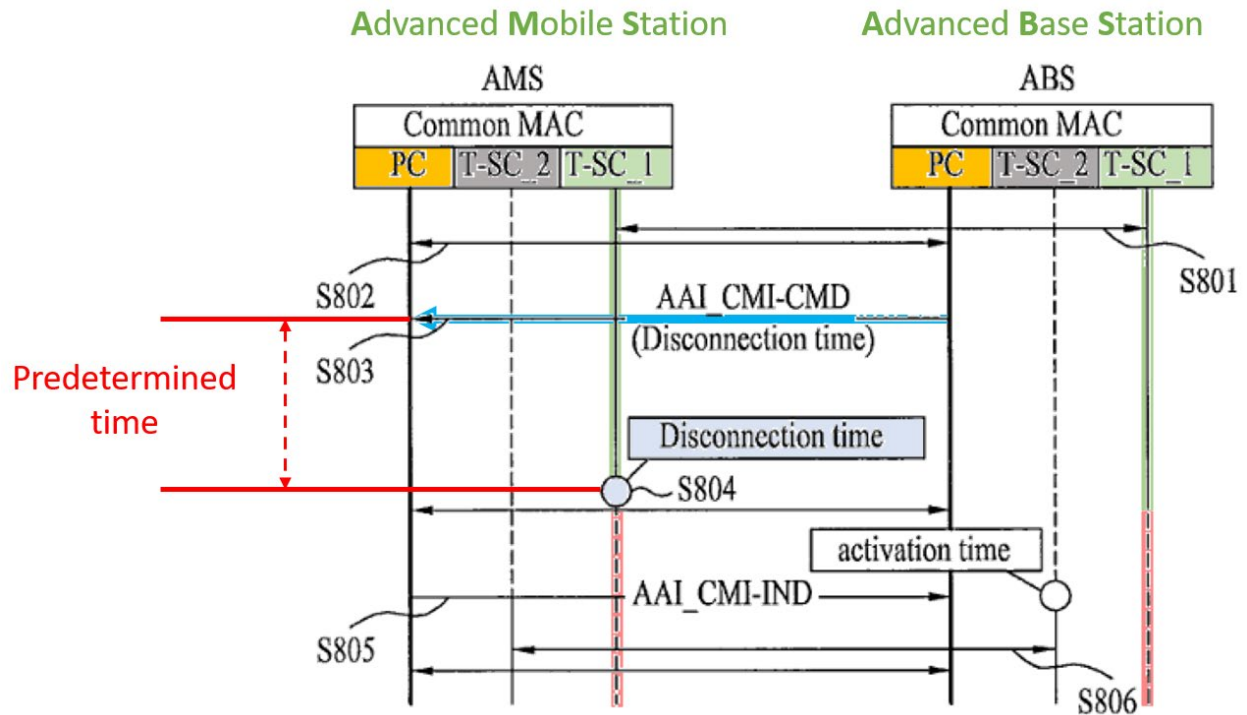


Here, Figure 8 illustrates communication between an Advanced Mobile Station (AMS) and Advanced Base Station (ABS). Initially, AMS transmits and receives data via a primary carrier at step S801, and it receives data through a secondary carrier at step S802. Ex. 1005, ¶[0159]. The two carriers that are active are the Primary Carrier (“PC,” shown in orange) and the Secondary Carrier 1 (labeled “T-SC_1” shown in green). As step S803 (highlighted in blue above), the MAC command message “AAI_CMI-CMD” is sent by the base station to the mobile station with a command to deactivate T-SC_1. Ex. 1005, ¶[0159]. The command contains a “disconnection time” which informs the mobile station about the timing to disconnect. Ex. 1005, ¶[0159]. Thus, at the indicated disconnection time S804

(shown above in blue), both the base station and the mobile station deactivate and disconnect from T-SC_1. Ex. 1005, ¶[0159] (“As can be seen from FIG. 8, the representation of the first target secondary carrier (T-SC_1) is changed from a solid line (activation) to a dotted line (deactivation) at the disconnection time.”).

In order to emphasize the deactivation of the secondary carrier by the AMS and ABS, a second annotated version of Figure 8 is included below that illustrates the deactivation by the AMS and ABS by changing a solid line (highlighted in green below) to a dashed line (highlighted in red below) in the figure. Ex. 1005, ¶[0159] (“As can be seen from FIG. 8, the representation of the first target secondary carrier (T-SC_1) is changed from a solid line (activation) to a dotted line (deactivation) at the disconnection time.”); *see also id.* ¶[0110] (“[A] carrier denoted by a solid line may represent an activated carrier, and a carrier denoted by a bold line may represent a primary carrier, and a carrier denoted by a dotted line may represent a deactivated carrier.”).

Ex. 1005 (Lee), Fig. 8 (annotated).



As shown here, Lee discloses that the ABS deactivates the secondary carrier at the disconnection time without waiting for further messaging from the AMS. Ex. 1005, ¶[0160] (disclosing that the ABS “can recognize the deactivation of the target carrier at a defined disconnection time without receiving a message for indicating the first target secondary carrier deactivation from the AMS . . .”).

With regard to the contents of the AAI_CM-CMD message for deactivation of a secondary carrier, Tables 6 through 12 provide exemplary formats for the message that could be used to indicate a disconnection time. For example, Table 6 (below) shows that the message could include: (i) a “Disconnection time” which indicates the time to disconnect the target carrier, (ii) an index that identifies the

carrier for deactivation (“Target carrier index”), and (iii) an indication of whether uplink and/or downlink communications are to be deactivated (“Deactivation of DL/UL”). Ex. 1005, ¶[163]; *see also* Ex. 1005, ¶¶[0164]-[0169], Tables 5, 7-12.

Ex. 1005 (Lee), Table 6 (Annotated).

TABLE 6		
Field	Size (bit)	Description
...		
If (Indication Type #1 == 1){		
Num of target carrier	[TBD]	The number of deactivated carrier(s)
Disconnection time	[TBD]	LSB bits of Superframe number at the time to disconnect the connection with the target carrier(s)
For(i=0; i< Num of target carrier; i++){		
Target carrier index	[TBD]	Target carrier index for deactivation
Deactivation of DL/UL	1	'0': Both DL/UL are deactivated '1': UL is deactivated but DL is kept active
}		
}		
...		

See also Ex. 1005, ¶[0164], Table 7 (illustrating an example where a disconnection time flag must also be included for deactivation to take place); *Id.* ¶[0165], Table 8 (providing an example where different disconnection times can be defined for each carrier to be deactivated).

Lee discloses, that in addition to the AAI_CM-CMD message, an AAI_CM-IND message can be used. The AAI_CM-IND message is transmitted from the AMS to the ABS and can include feedback regarding the activation and deactivation processes performed at the AMS. Ex. 1005, ¶[0010]; *see also id.* at ¶[0112]. Lee discloses that HARQ information can be transmitted in an AAI_CM-IND message.

Ex. 1005, ¶¶[0117], [0122]. Lee, however, does not disclose all of the details regarding the implementation of the HARQ processes. Instead, a person of ordinary skill in the art would understand that Lee's carrier activation and deactivation could be implemented with any HARQ process.

B. U.S. Patent App. Pub. No. 2011/0103326 to Kim et al. ("Kim") (Ex. 1006)

1. High Level Description of Kim

Kim is titled "Method of Operating User Equipment in Wireless Communication System Using a Plurality of Uplink Frequencies" and was filed on October 28, 2010, and claims priority to two provisional applications: Provisional Application No. 61/256,294 ("Kim 294 Provisional") filed on October 29, 2009, and Provisional Application No. 61/257,427 ("Kim 427 Provisional") filed on November 2, 2009. Ex. 1006, Cover. Kim is assigned to LG Electronics Inc.

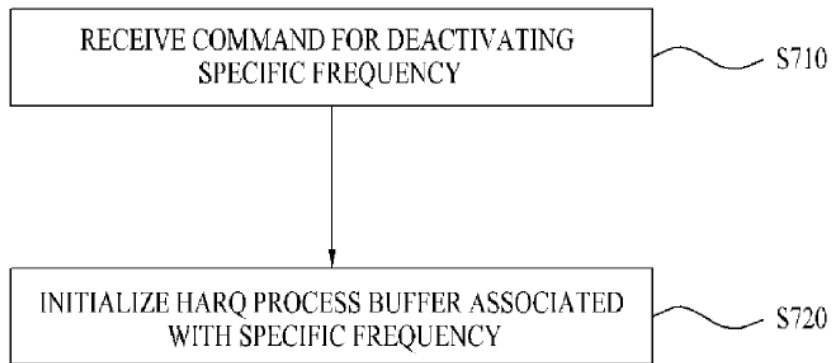
Kim discloses "a method of operating the user equipment in the wireless communication system using the plurality of uplink frequencies [which] includes identifying deactivation of a specific uplink frequency among the plurality of uplink frequencies, and flushing a Hybrid Automatic Repeat reQuest (HARQ) process associated with the specific uplink frequency." Ex. 1006, Abstract. As background, Kim explains that "simultaneous communication between a user equipment (UE) and a base station using a plurality of frequencies or carriers is referred to as carrier aggregation." Ex. 1006, ¶[0016]; *see also* Ex. 1006, ¶[0054]-[0057]. Kim also

explains that HARQ processes can be used in conjunction with carrier aggregation. Ex. 1006, ¶[0017]; Ex. 1009, ¶¶94-95. Kim, however, explains that errors can occur when using carrier aggregation with HARQ that stem from the deactivation of secondary carriers. Specifically, if a secondary carrier is deactivated when its HARQ buffer still includes transmitted data, then an error can occur if that secondary carrier is ever reactivated at a later time. Ex. 1006, ¶[0017]. To help address these issues and more efficiently utilize radio resources, Kim proposes flushing or initializing the HARQ buffers/process when a carrier is deactivated. Ex. 1006, ¶¶[0024], [0029], Fig. 7, Fig. 8.

For example, Figure 7 (below) of Kim provides a flowchart of a secondary carrier deactivation process, which includes (1) receiving the deactivation command and (2) initializing the HARQ process buffer for the associated secondary carrier. Ex. 1006, ¶[0073]-[0079]. Kim explains that initializing of the HARQ process buffer involves “discard[ing] data present in all HARQ process buffers of the HARQ entity associated with the deactivated secondary uplink frequency.” Ex. 1006, ¶[0080].

Ex. 1006 (Kim), Fig. 7.

FIG. 7

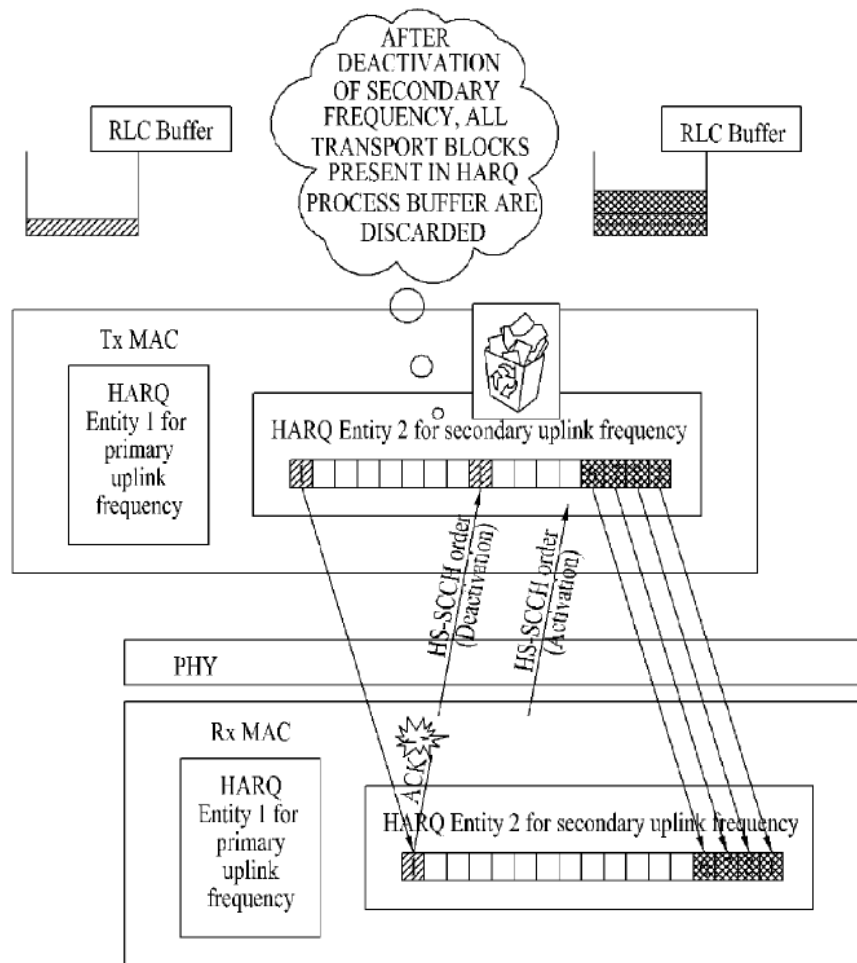


As another example, Figure 8 (below) illustrates how, after deactivation, the HARQ buffers associated with a given secondary frequency are flushed or discarded.

Ex. 1006, ¶[0073], Fig. 8.

Ex. 1006 (Kim), Fig. 8.

FIG. 8



As described above in Sections VII.C.–VII.D., the HARQ process is not novel and is well known by POSITAs, as is its use in carrier aggregation. Ex. 1009, ¶102; *see also id.* at ¶¶42–49. Furthermore, it is well known that HARQ processes are used by the UE and BS for uplink and downlink messages. *Id.* at ¶102. As such, while Kim’s disclosure largely focuses on the uplink and UE side, a POSITA would understand that its disclosure could be applied to the downlink and base station side as well. *Id.*

2. Kim is prior art as of its priority date

Because the '662 Patent is not entitled to the priority date of August 12, 2010, and is at best entitled to a November 8, 2010 priority date, Kim is prior art under § 102(e) because it was filed on was filed on October 28, 2010. However, to the extent Patent Owner argues that the '662 Patent is entitled to an August 12, 2010 priority date, the following analysis under *Dynamic Drinkware* demonstrates that Kim is entitled to the priority of the Kim Provisional Applications from 2009. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1382 (Fed. Cir. 2015) (stating a reference is “entitled to claim the benefit of the filing date of its provisional application if the disclosure of the provisional application provides support for the claims in the reference patent.”).

a) The Kim provisional applications provide written description for Kim Claim 1 (*Dynamic Drinkware*)

Kim is entitled to at least a November 2, 2009 prior art date because Kim's priority applications provide support for at least claim 1 as well as support for the subject matter relied upon in this petition. Ex. 1009, ¶104; *see also Apple Inc. v. Telefonaktiebolaget LM Ericsson*, IPR2022-00348, Paper 9 at 6 (PTAB Sept. 21, 2022) (explaining that for a reference to be entitled to its priority date, the “provisional application must ‘describe[] the subject matter’ relied upon as prior art in the reference patent.”). The Kim provisional applications (Kim '294 Provisional (Ex. 1007) and Kim '427 Provisional (Ex. 1008)) provide written description for

Kim Claim 1. Ex. 1009, ¶¶105-108. The table below, which maps the claim language to the disclosures of the Kim Provisionals using color coding, shows exemplary disclosures from the Kim provisional applications providing the written description for Kim Claim 1. Ex. 1009, ¶105.

1. <u>A method of operating a user equipment in a wireless communication system using a plurality of uplink frequencies, the method comprising:</u> <u>identifying deactivation of a specific uplink frequency among the plurality of uplink frequencies; and</u> <u>flushing a Hybrid Automatic Repeat reQuest (HARQ) process associated with the specific uplink frequency.</u>	<u>Kim '294 Provisional (Ex. 1007)</u> • <u>“In DC-HSUPA, unlike primary carrier, secondary carrier is dynamically activated or de-activated by NodeB.”</u> Ex. 1007 at 53. • <u>“When secondary carrier of UE is de-activated, it is possible that there exists data to be transmitted in HARQ buffer. For instance, when secondary carrier is de-activated after NodeB receives data through the secondary carrier from the UE and transmits HARQ ACK, if ACK-to-NACK takes place in the UE’s side, the UE may not discard the data from the HARQ buffer. After that, if the secondary carrier of the UE is re-activated by Node B, the UE would try to retransmit the remaining data in the HARQ buffer since the HARQ buffer of the UE is not empty. Therefore, when the secondary carrier is de-activated,</u>
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	<u>the UE can prevent unnecessary transmission by flushing the HARQ buffer.” Ex. 1007 at 53.</u> • “Proposal 1: <u>The UE shall flush HARQ process buffer corresponding to the secondary carrier when secondary carrier is de-activated (or re-activated).”</u> Ex. 1007 at 53. • “<u>De-activation on Secondary Uplink Frequency:</u> If Secondary Uplink Frequency is de-activated by lower layer, the UE shall: <u>deactivate all HARQ processes corresponding to secondary carrier; flush all buffers corresponding to secondary carrier.”</u> Ex. 1007 at 54 <u>Kim ’427 Provisional</u> (Ex. 1008) • “<u>In Dual Cell E-DCH operation, unlike the primary carrier, the secondary carrier is dynamically activated/de-activated by Node B.”</u> Ex. 1008 at 19. • “<u>When the secondary carrier is de-activated,</u> the data to be transmitted on the carrier might be remained in the HARQ process buffer on the UE. Assuming that Node B receives data on the secondary carrier from
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the UE then transmits the HARQ ACK to the UE and de-activates the secondary carrier. If ACK-to-NACK error occurs at the UE side, the UE will not flush HARQ process buffer on the secondary carrier. Moments later if the secondary carrier is re-activated by Node B, the UE might try to re-transmit the data in the HARQ process buffer since the buffer is not empty. In order to prevent this problem, the UE should flush HARQ process buffer on the secondary carrier when the carrier is deactivated (or re-activated).” Ex. 1008 at 19.

- “Proposal 1: The UE shall flush HARQ process buffer corresponding to the secondary carrier when secondary carrier is de-activated (or re-activated).”

Ex. 1008 at 19.

- “De-activation on Secondary Uplink Frequency: If Secondary Uplink Frequency is de-activated by lower layer, the UE shall on the secondary carrier: deactivate all HARQ processes and flush all buffers.”

Ex. 1008 at 20.

As the above table shows, the Kim provisional applications both disclose each element of Claim 1 from Kim. Ex. 1009, ¶106. In particular, the Kim provisional applications disclose secondary carriers that can be used as secondary uplink frequencies by UEs, which provides written description support for the preamble of Claim 1 from Kim. Ex. 1009, ¶106. Furthermore, the Kim provisional applications' disclosure of dynamically activating and deactivating secondary carriers and describing what to do once said carriers are deactivated also provides written support for the first limitation of Claim 1 from Kim, as a POSITA would understand that doing so would necessarily involve the UE "identifying deactivation of a specific uplink frequency among the plurality of uplink frequencies." Ex. 1009, ¶107. Additionally, the Kim provisional applications' explicit disclosure that "[t]he UE shall flush HARQ process buffer corresponding to the secondary carrier when secondary carrier is de-activated" provides clear written description support for the final limitation of Claim 1 from Kim: flushing a Hybrid Automatic Repeat reQuest (HARQ) process associated with the specific uplink frequency." Ex. 1009, ¶108. Thus, Kim '294 Provisional (Ex. 1007) and Kim '427 Provisional (Ex. 1008) provide written description support for Kim Claim 1. Ex. 1009, ¶¶104-108.

b) The Kim provisional applications describe the subject matter relied upon as prior art in this petition

Furthermore, the Kim provisional applications (Kim '294 Provisional (Ex. 1007) filed on October 29, 2009, and Kim '427 Provisional (Ex. 1008) filed on November 2, 2009) describe the subject matter relied upon as prior art in this petition. Ex. 1009, ¶¶109-11110-12. For example, and as will be discussed in more detail below, for the purposes of this petition, Kim primarily provides support for the concept of “initializing uplink (UL) and DL buffers associated with the secondary carrier” ('662 Patent Claim 1). As can be seen in the table above, the Kim provisional applications disclose that “[t]he UE shall flush HARQ process buffer corresponding to the secondary carrier when secondary carrier is de-activated (or re-activated).” Ex. 1007 at 53; Ex. 1008 at 19. As such and as will be discussed below, the Kim '294 Provisional (Ex. 1007) and Kim '427 Provisional (Ex. 1008) describe the subject matter relied upon as prior art in this petition. Ex. 1009, ¶110. Thus, Kim is entitled to claim the benefit of the filing date of its provisional application and is thus prior art to the '662 Patent even if the '662 Patent is entitled to its alleged priority date, which it is not for the reasons discussed in Section IX above. Ex. 1009, ¶111.

C. Motivation to Combine

A POSITA would have been motivated to combine Lee with Kim with a reasonable expectation of success. Ex. 1009, ¶112.

***Inter Partes* Review of U.S. Patent No. 9,565,662**

First, Lee and Kim are directed to the same field of endeavor. Both Lee and Kim are directed to improvements to carrier aggregation and more specifically, deactivation of secondary cells as part of the carrier aggregation process. Ex. 1005, ¶¶[0097]; Ex. 1006, ¶¶[0004], [0024]; Ex. 1001, Abs.; Ex. 1009, ¶113.

Second, Lee, which is assigned to LG Electronics, discloses concepts associated with secondary carriers, timing of deactivation, and retransmission messages, but does not explain in detail what happens *after* the process is complete, including how HARQ processes are affected by deactivation of an associated carrier. Kim, also assigned to LG Electronics, fills that gap. For example, Lee discloses “a carrier management procedure” that uses MAC messages to activate and deactivate carriers. Ex. 1005, ¶¶[0003], [0014]-[0019]. Furthermore, Lee discloses that HARQ processes can be applied to the MAC control messages described by Lee. Ex. 1005, ¶¶[0117]-[0124]. Lee also describes that the BS may contain buffers to store arithmetically-processed information for a predetermined time. Ex. 1005, ¶[0304]. As such, a POSITA implementing the concepts from Lee would have understood that the HARQ processes would be impacted by the secondary carrier deactivation described in Lee. Ex. 1009, ¶¶114-15. A POSITA would have been motivated to look for similar art, such as Kim, for guidance on how deactivation of a carrier affects the HARQ processes associated with that carrier. Ex. 1009, ¶¶115-16.

A POSITA would have been motivated to consider Kim, which is also assigned to LG Electronics, because Kim describes deactivation of carriers and how that deactivation is handled in conjunction with HARQ processes. Ex. 1009, ¶116. Kim's deactivation process involves (1) receiving the deactivation command and (2) initializing the HARQ process buffer for the associated secondary carrier. Ex. 1006, ¶[0074]-[0079]. Kim explains that each uplink frequency (or carrier) has its own HARQ entity that maintains the HARQ processes for said frequency. Ex. 1006, ¶[0080]. Kim explains that initializing of the HARQ process buffer involves "discard[ing] data present in all HARQ process buffers of the HARQ entity associated with the deactivated secondary uplink frequency." Ex. 1006, ¶[0080]. Furthermore, while Kim focuses on the uplink frequency, the same logic would apply to the downlink frequency in the BS (*e.g.*, those HARQ buffers could be flushed as well). Ex. 1009, ¶116. Thus, a POSITA following the steps of deactivation from Lee would look to Kim to understand an obvious way to complete the process. Ex. 1009, ¶116. Moreover, a POSITA would have a reasonable expectation of success in combining the two references since Kim's steps of initializing the HARQ buffers follows Lee's steps of deactivation. Ex. 1009, ¶116.

Third, the fact that both Lee and Kim are assigned to LG Electronics furthers the motivation to combine. *See* Ex. 1005; Ex. 1006. When looking for art to combine with Lee, a POSITA would have been motivated to look for other art by LG

Electronics as a POSITA would have a higher expectation of success by combining art from the same company directed to the same technological area. Ex. 1009, ¶117.

Fourth, a POSITA would have had a reasonable expectation of success in combining Lee with Kim as both disclose the use of carrier aggregation in known LTE systems. Ex. 1005, ¶¶[0066]-[0067]; Ex. 1006, ¶¶[0056]-[0058]; Ex. 1009, ¶118. Further, a POSITA looking to apply the HARQ process described in Kim would have recognized its application to carrier aggregation in LTE. Ex. 1005, ¶¶[0066]-[0067]; Ex. 1006, ¶¶[0056]-[0058]; Ex. 1009, ¶118.

Thus, a POSITA looking to implement the disclosures from Lee would have been motivated to look to Kim for guidance as to what one could do to the HARQ processes (or other buffers associated with the secondary carrier) after deactivating a secondary carrier. Ex. 1009, ¶119.

XI. GROUND OF REJECTION: LEE IN VIEW OF KIM OBVIOUS CLAIMS 1-4

Lee in view of Kim renders Claims 1-4 of the '662 Patent invalid as obvious under 35 U.S. C. § 103.

A. Independent Claim 1

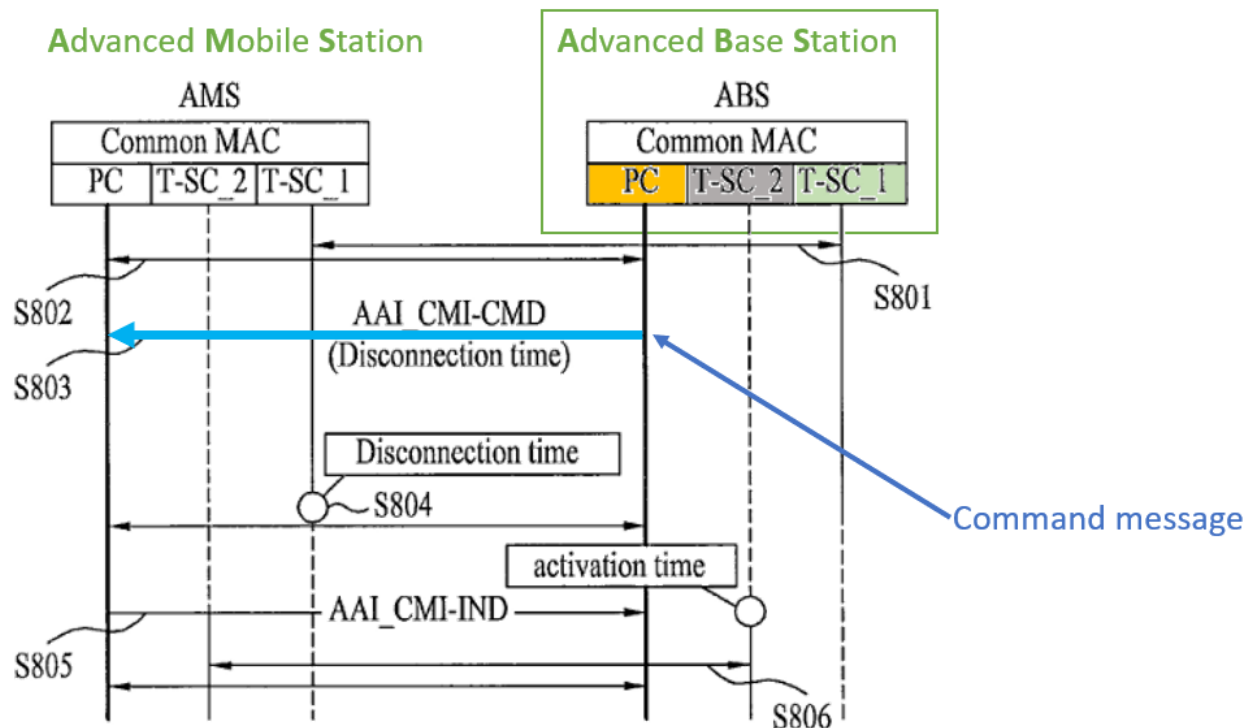
[1.p] A carrier management method of a base station for use in a carrier aggregation environment, comprising:

To the extent the preamble is limiting, Lee renders obvious this claim limitation. Ex. 1009, ¶¶120-25.

As described above, Lee describes a method for activation and deactivation of carriers in a carrier aggregation environment. For example, Lee discloses “a method and apparatus for performing a carrier management procedure in a broadband wireless communication system supporting multiple carriers.” Ex. 1005, ¶[0003]; Ex. 1009, ¶121. Lee explains that “multi-carrier aggregation . . . allow[s] the MS to exchange data with the BS through a plurality of carriers.” Ex. 1005, ¶[0006]; Ex. 1009, ¶121. Lee further states that secondary carriers are additional carriers that can be used by an MS, which are “used according to a specific command by the base station (BS).” Ex. 1005, ¶[0009]; Ex. 1009, ¶121. In addition, Lee explains that control messages sent by the base station can be used for this carrier management. Ex. 1005, ¶[0010]; Ex. 1009, ¶122; *see also* Ex. 1005, ¶[0095] (“The base station (BS) may activate and/or deactivate the secondary carrier using an AAI Carrier Management Command (AAI_CM-CMD) message.”); Ex. 1005, ¶[0104]. For example, Lee identifies that the “Advanced Air Interface Carrier Management Command (AAI_CM-CMD) message” that is “received from the base station (BS)” enables “primary carrier change, secondary carrier management (secondary carrier activation and/or deactivation), and carrier switching.” Ex. 1005, ¶[0010]; Ex. 1009, ¶122.

Figure 8 from Lee illustrates an exemplary system utilizing Lee's disclosed method. Ex. 1005, ¶[0049]; Ex. 1009, ¶123. Figure 8 shows how the base station in Lee performs carrier management in a carrier aggregation environment.

Ex. 1005 (Lee), Fig. 8 (Annotated); Ex. 1009, ¶123.



A POSITA would thus understand that Lee teaches a carrier management method of a base station for use in a carrier aggregation environment. Ex. 1009, ¶125. Thus, Lee discloses and/or renders obvious “[a] carrier management method of a base station for use in a carrier aggregation environment,” as recited in Claim 1.

[1.a] transmitting a deactivation message for a secondary carrier to a terminal;

Lee renders obvious this claim limitation. Ex. 1009, ¶¶126-31.

First, the AAI_CM-CMD message described above is a deactivation message for a secondary carrier. Lee discloses “[t]he base station (BS) may activate and/or *deactivate the secondary carrier* using an AAI Carrier Management Command (AAI_CM-CMD) message.” Ex. 1005, ¶[0095] (emphasis added); *see also* Ex. 1005, ¶[0104] ¶[0010].

Table 5 further supports that the AAI_CM-CMD message is a deactivation message. Lee provides an overview of the basic parameters that can be configured in the AAI_CM-CMD messages. Ex. 1005, ¶[0162]; Ex. 1009, ¶128. As shown below, if the “Action Code” field in the AAI_CM-CMD is set to 0, then the AAI_CM-CMD message “is for secondary carrier activation and/or deactivation.” Ex. 1005, Table 5; *see also* Ex. 1005, ¶¶[0133], [0150], [0153]; Ex. 1009, ¶128. Furthermore, the “Indication Type” controls whether the message is an activation message or a deactivation message, where Bit #1 is set to 0 for deactivation. Ex. 1005, Table 5; *see also* Ex. 1005, ¶¶[0095], [0135], [0153]; Ex. 1009, ¶128.

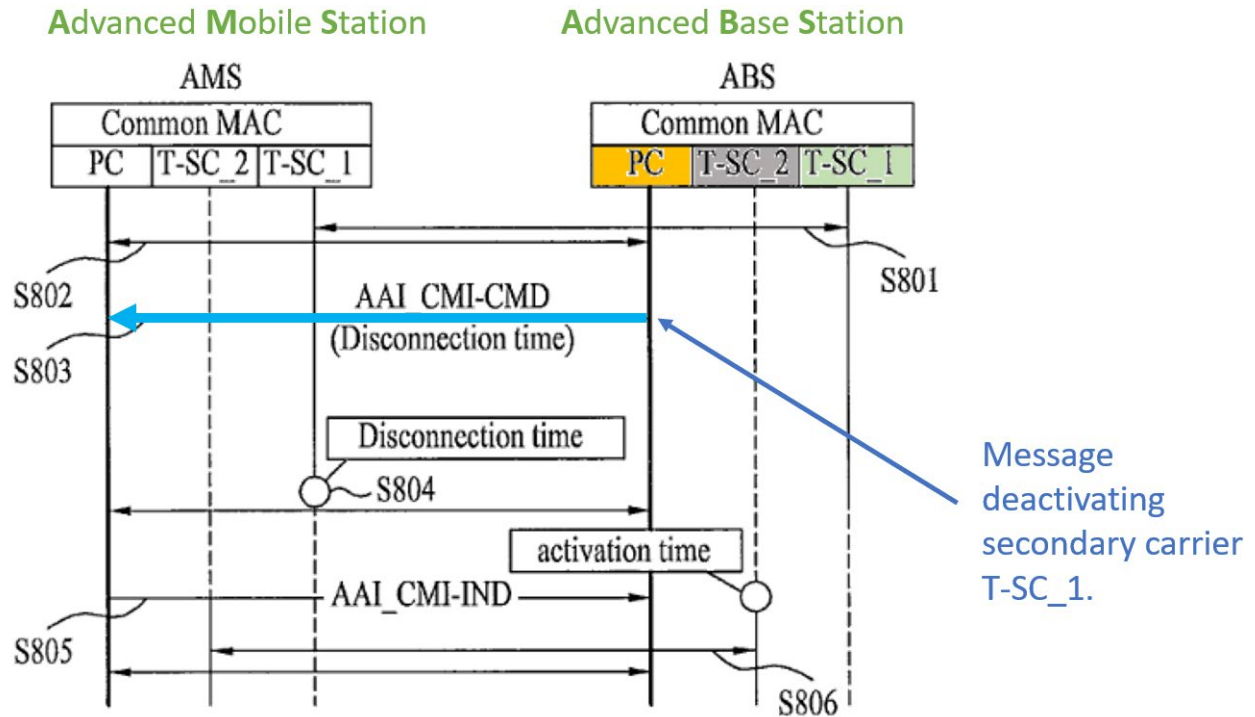
Ex. 1005 (Lee), Table 5 (Annotated, Partial) Ex. 1009, ¶128.

TABLE 5		
Field	Size (bit)	Description
AAI_Carrier Management Command message format() {		
Management Message Type	8	AAI_CM-CMD
Action code	1	0: Secondary Carrier Management 1: Primary carrier change
If (Action code == 0) {		This message is for secondary carrier activation and/or deactivation
Indication Type	2	For Activation and/or Deactivation Bit #0: '0': No action, '1': Activation Bit #1: '0': No action, '1': Deactivation

Second, Lee discloses that the base station transmits the deactivation message for a secondary carrier to a terminal. Ex. 1005, ¶¶[0104] (“The Advanced Air Interface Carrier Management Command (AAI_CM-CMD) message is transmitted by a base station (BS) . . .”), [0049], [0159]-[0160], Fig. 8; Ex. 1009, ¶129. Figure 8 illustrates this point. Namely, at step S803 the AAI_CM-CMD message transmitted from the ABS (the base station) to the AMS (the mobile station) and “includes parameters that are needed to deactivate the first target secondary carrier (T-SC_1) and activate the second target secondary carrier (T-SC_2).” Ex. 1005, ¶¶[0159]-[0160]⁵, Fig. 8; Ex. 1009, ¶129.

⁵ The cited portion of the specification states the message is sent from AMS to AMS, but that is a clear typographical error. The arrows in Figure 8 show that the message is sent from the ABS to the AMS.

Ex. 1005 (Lee), Fig. 8 (Annotated); Ex. 1009, ¶129.



Thus, a POSITA would understand that Lee discloses the base station transmitting a deactivation message for a secondary carrier to a terminal. Ex. 1009, ¶130. Thus, Lee discloses and/or renders obvious “transmitting a deactivation message for a secondary carrier to a terminal,” as recited in Claim 1.

[1.b] changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message; and

Lee renders obvious this claim limitation. Ex. 1009, ¶¶132-50.

Lee discloses changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message because Lee discloses that the deactivation (AAI_CM-CMD) message can include a

“disconnection time.” The base station (ABS) and mobile (AMS) deactivate the secondary carrier at the expiration of the “disconnection time.” Ex. 1005, ¶¶[140]-[142], [0146]-[0147], [0153]-[0161], Tables 4-12; Ex. 1009, ¶¶133-41. Thus, the “disconnection time” is a predetermined time from the transmission of the deactivation message, and Lee discloses changing the secondary carrier to a deactivation state based on a predetermined time (*i.e.*, disconnection time) from the transmission of the deactivation message.

The following provides additional detail regarding how the disconnection time (i) is included in the deactivation (AAI_CM-CMD) message, (ii) is a predetermined time, and (iii) indicates when the change to a deactivation state should occur with respect to the deactivation (AAI_CM-CMD) message.

First, as described above, Lee discloses examples of the contents of the AAI_CM-CMD message when used to deactivate a secondary carrier and discloses that the message could indicate that disconnection time is defined in the message. For example, Lee described four different exemplary methods for determining the “disconnection time.” Ex. 1005, ¶¶[0153]-[0157]; Ex. 1009, ¶136-37. First, “[i]n the case where the action code of the AAI_CM-CMD message is set to ‘0’ (secondary carrier management) and the indication type #1 is set to ‘1’ (deactivation), *a disconnection time is defined.*” Ex. 1005, ¶[0154] (emphasis added); Ex. 1009, ¶138. Second, “when the action code of the AAI_CM-CMD message is set to ‘0’

(secondary carrier management), the indication type #0 is set to ‘1’ (activation), and the indication type #1 is also set to ‘1’ (deactivation), *a disconnection time is defined.*” Ex. 1005, ¶[0154] (emphasis added); Ex. 1009, ¶139. Third, “when a disconnection time flag is defined and the disconnection time flag is set to ‘1’, *a disconnection time is defined.*” Ex. 1005, ¶[0156] (emphasis added); Ex. 1009, ¶140. Fourth, “[n]o disconnection time is defined in the AAI_CM-CMD message, and a *reception time of the AAI_CM-CMD message is implicitly defined as a disconnection time* of the target carrier.” Ex. 1005, ¶[0157] (emphasis added); Ex. 1009, ¶141. Lee further explains that in the case of deactivating multiple carriers that different times can be used for each carrier, or the same disconnection time can be used to deactivate all carriers simultaneously. Ex. 1005, ¶[0158]; Ex. 1009, ¶142. A POSITA would have understood that to deactivate carriers at different times or simultaneously, the disconnection timing would have to be predetermined. Thus, Lee discloses defining a predetermined “disconnection time” when deactivating secondary carriers. Ex. 1009, ¶142.

Lee also discloses examples of the specific fields that could include the disconnection time. For example, Tables 6 through 12 provide exemplary formats for the message that could be used for a deactivation of a secondary carrier and that include a disconnection time. *Id.* at ¶143-45. For example, Table 6 (below) shows that the message could include: (i) a “Disconnection time” which indicates the time

to disconnect the target carrier, (ii) an index that identifies the carrier for deactivation (“Target carrier index”), and (iii) an indication of whether uplink and/or downlink communications are to be deactivated (“Deactivation of DL/UL”). Ex. 1005, ¶[163]; *see also* Ex. 1005, ¶[0164]-[0169], Tables 5, 7-12.

Ex. 1005 (Lee), Table 6 (Annotated); Ex. 1009, ¶144.

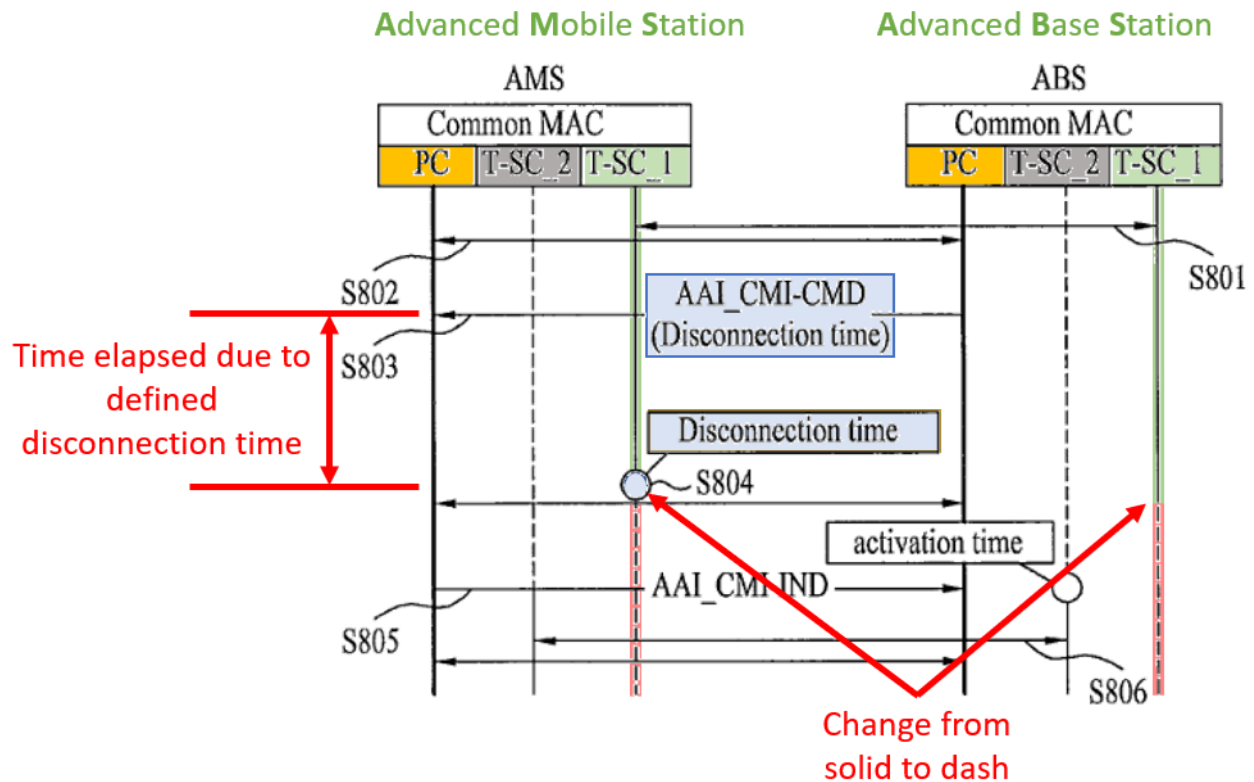
TABLE 6		
Field	Size (bit)	Description
...		
If (Indication Type #1 == 1){		
Num of target carrier		
Disconnection time	[TBD]	The number of deactivated carrier(s)
For(i=0; i< Num of target carrier; i++){		
Target carrier index	[TBD]	LSB bits of Superframe number at the time to disconnect the connection with the target carrier(s)
Deactivation of DL/UL	[TBD]	Target carrier index for deactivation
	1	'0': Both DL/UL are deactivated
		'1': UL is deactivated but DL is kept active
}		
}		
...		

See also Ex. 1005, ¶[0164], Table 7 (illustrating an example where a disconnection time flag must also be included for deactivation to take place); *Id.* ¶[0165], Table 8 (providing an example where different disconnection times can be defined for each carrier to be deactivated); Table 9 (illustrating example including a disconnection time flag); Table 10 (illustrating example where activation and deactivation are simultaneously indicated); Table 11 (illustrating example for simultaneous activation and deactivation and the use of a disconnection time flag).

Second, the disconnection time is a predetermined time. Ex. 1009, ¶136. Because the disconnection time is communicated by the base station in the AAI_CMI-CMD message, the time is determined before the UE receives the command, thus making the disconnection time predetermined. *Id.* at ¶136.

Third, Lee discloses changing the secondary carrier to a deactivation state based on the disconnection time. *Id.* at ¶146. Figure 8 (below) from Lee illustrates this process. Ex. 1005, ¶¶[0159]-[0160]; Ex. 1009, ¶146. As shown below, “the representation of the first target secondary carrier (T-SC_1) is changed from a solid line (activation) to a dotted line (deactivation) at the disconnection time.” Ex. 1005, ¶¶[0159]; Ex. 1009, ¶146.

Ex. 1005 (Lee), Fig. 8 (Annotated); Ex. 1009, ¶146.



As shown here, the base station (ABS) changes the secondary carrier (T-SC-1) from an active state to a deactivation state after the disconnection time expires. Ex. 1009, ¶147-148. Further, as shown in Figure 8, this disconnection time is based off the transmission of the deactivation (AAI_CM-CMD) message. *Id.* at ¶148. Lee states that “a disconnection time of the target carrier can be defined *in relation to* the AAI_CM-CMD message.” Ex. 1005, ¶[0153]. This is also shown above as the red arrow with the label “Time elapsed due to defined disconnection time,” which is connected to the time the AAI_CMI-CMD message is sent/received and the disconnection time. Ex. 1009, ¶148. Lee thus discloses that the secondary carrier is

deactivated based on a predetermined time from the transmission of the deactivation (AAI_CM-CMD) message. Ex. 1009, ¶¶146-49.

As discussed above, a POSITA would have understood that Lee teaches changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message. Ex. 1009, ¶149. Thus, Lee renders obvious “changing the secondary carrier to a deactivation state based on a predetermined time from the transmission of the deactivation message,” as recited in Claim 1.

[1.c] stopping downlink (DL) data transmission of the secondary carrier and initializing uplink (UL) and DL buffers associated with the secondary carrier after transmitting the deactivation message.

Lee alone or in combination with Kim renders obvious this claim limitation. Ex. 1009, ¶¶151-65. This claim limitation has two parts: (i) “stopping downlink (DL) data transmission of the secondary carrier . . . after transmitting the deactivation message” and (ii) “initializing uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message.” The following illustrates how Lee alone or in combination with Kim teaches each part of this limitation.

(1) Stopping downlink (DL) data transmission of the secondary carrier ... after transmitting the deactivation message

Lee discloses that when the secondary carrier is deactivated after the deactivation message, downlink data transmission is stopped. *Id.* at ¶¶153-57.

First, Lee discloses stopping the downlink (DL) data transmissions when an AAI_CM-CMD message specifies deactivation of a secondary carrier. Ex. 1005, ¶[0095]; Ex. 1009, ¶154. For example, Lee discloses a parameter of the AAI_CM-CMD message that indicates whether the deactivation of the secondary carrier will also cause downlink data transmission on that carrier to stop. Ex. 1005, Table 6 (below); Ex. 1009, ¶154. Specifically, when the “Deactivation of DL/UL” parameter is set to 0, then downlink data transmissions on a given carrier are stopped.

Ex. 1005 (Lee), Table 6 (Annotated); Ex. 1009, ¶154.

TABLE 6		
Field	Size (bit)	Description
...		
If (Indication Type #1 == 1){		
Num of target carrier	[TBD]	The number of deactivated carrier(s)
Disconnection time	[TBD]	LSB bits of Superframe number at the time to disconnect the connection with the target carrier(s)
For(i=0; i< Num of target carrier; i++){		
Target carrier index	[TBD]	Target carrier index for deactivation
Deactivation of DL/UL	1	'0': Both DL/UL are deactivated '1': UL is deactivated but DL is kept active
}		
}		
...		

Second, as explained above with respect to Limitation [1.b] (and incorporated herein by reference), Lee discloses that the disclosed secondary carrier deactivation

can occur at the “disconnection time,” which would be after the deactivation message is transmitted. Ex. 1009, ¶155; *see e.g.*, Ex. 1005, ¶[0159] (“[T]he AMS firstly deactivates the first target secondary carrier (T-SC₁) at the disconnection time indicated by the AAI_CM-CMD message at step S804”), Table 4 (The disconnection time is the “LSB bits of Superframe number at the time to disconnect the connection with the target carrier(s).”).

Third, Lee discloses stopping the DL data transmission at deactivation. Ex. 1009, ¶156. Lee describes that its method of carrier change “includes disconnecting a signal path on the serving carrier at the disconnection time.” Ex. 1005, ¶[0024]. A POSITA would have understood that disconnecting a signal path means stopping transmissions on that path. Ex. 1009, ¶156.

As further evidence, Figure 8 of Lee and its accompanying disclosure also shows that Lee discloses stopping downlink data transmission of the secondary carrier. *See* Ex. 1005, ¶[0159], Fig. 8; Ex. 1009, ¶156. For example, Lee explains that “the representation of the first target secondary carrier (T-SC₁) is changed from a solid line (activation) to a dotted line (deactivation) at the disconnection time.” *See* Ex. 1005, ¶[0159] (emphasis added), Fig. 8; Ex. 1009, ¶156; *see also* Ex. 1005, ¶[0110]. In Figure 8, no signals are passed between deactivated carriers (dotted line), further showing the signal is stopped. Thus, a POSITA would understand from this disclosure that the dotted line means that data is not being

transmitted on the secondary carrier for that AMS. Ex. 1009, ¶157. A POSITA would thus understand that deactivating a carrier in Lee would involve at least stopping downlink data transmission on the secondary carrier. Ex. 1009, ¶157.

(2) Initializing uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message

Lee in combination with Kim renders obvious initializing uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message. Ex. 1009, ¶¶158-65.

First, Lee discloses various aspects of the HARQ process. *Id.* at ¶158. For example, Lee discloses that the HARQ process (as discussed above in Sections VII.C.–VII.D.) can be used with the MAC control messaging disclosed in Lee. Ex. 1005, ¶¶[0122]-[0124]; Ex. 1009, ¶158. Lee likewise discloses the use of retransmission timers and explains, at a high-level, buffers associated with the secondary carrier such as the known concepts of retransmission buffers and HARQ buffers. Ex. 1005, ¶¶[0105], [0107-0108], [0120-0123], [0125-0126], [0131], [0142], [0147], Table 4, Table 5 (stating the action time must be a value more than the retransmission time for the control message), Fig. 8; Ex. 1009, ¶158. Furthermore, Lee discloses that the AAI_CM-IND message can be sent “[i]n order to inform the ABS of the successful reception of the AAI_CM-CMD message.” Ex. 1005, ¶[0112]; Ex. 1009, ¶158. Finally, Lee also discloses that the BS may contain

buffers to store arithmetically-processed information for a predetermined time. Ex. 1005, ¶[0304]; Ex. 1009, ¶158.

A POSITA would have found it obvious to initialize the uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message in view of Lee's disclosures of the HARQ process and retransmission timers. Ex. 1009, ¶159. It would be obvious that, if a HARQ process is running on the MAC control messages as disclosed by Lee, one would flush the uplink and downlink buffers associated with that process and the secondary carrier once the uplink and downlink secondary carriers have been deactivated. Ex. 1009, ¶159. Memory is a finite resource in a base station, and a POSITA would be motivated to find ways to preserve memory such as by flushing buffers for carriers that are no longer active. Ex. 1009, ¶159. As such, initializing the uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message would have been obvious to a POSITA in view of Lee alone. Ex. 1009, ¶¶159-60.

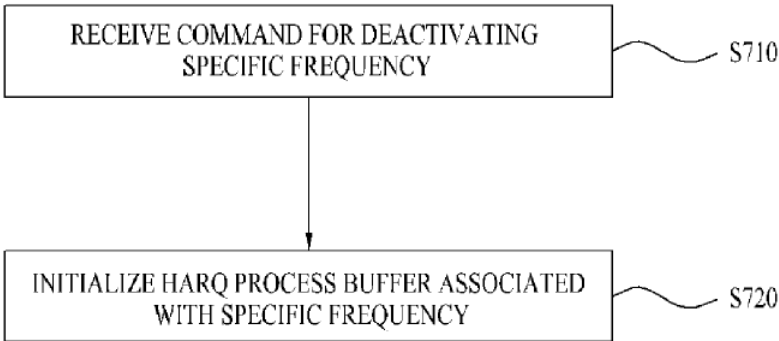
To the extent Patent Owner asserts that initializing the uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message would not have been obvious to a POSITA in view of Lee alone, Kim discloses initializing the uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message. Ex. 1006, ¶¶[0073]-[0074], [0079]-[0080], Figs. 7-8; Ex. 1009, ¶161. Furthermore, a POSITA would have been

motivated to combine Lee with Kim with a reasonable expectation of success (*see* Section X. C. and incorporated herein by reference). Ex. 1009, ¶161. Again, Kim discloses details about the processes that would follow deactivation, and thus a person of ordinary skill in the art would have been motivated to combine Lee with Kim to understand the steps to take after deactivation.

For example, Kim explicitly discloses that “if the UE determines that a specific frequency is deactivated, the UE discards data present in the buffer of the HARQ process associated with the deactivated frequency.” Ex. 1006, ¶[0074], Fig. 7; Ex. 1009, ¶162. As another example, Kim discloses that when a UE receives and instruction to deactivate a given carrier, “[t]he UE *initializes the HARQ process buffer associated with the specific frequency* which is instructed to be deactivated by the base station.” Ex. 1006, ¶[0079] (emphasis added), Fig. 7; Ex. 1009, ¶162163. Figure 7 (below) from Kim provides further disclosure of initializing the uplink and downlink buffers associated with the secondary carrier after transmitting the deactivation message. Ex. 1006, Fig. 7; Ex. 1009, ¶162; *see also* Ex. 1006, Fig. 8.

Ex. 1006 (Kim), Fig. 7.

FIG. 7



To the extent Patent Owner attempts to differentiate Kim on the grounds that it is primarily directed to uplink communications, as described above in Sections VII.C.–VII.D., it is well known that HARQ processes run on both uplink and downlink communications on both the UE and BS side. Ex. 1009, ¶163; *see also id.* at ¶¶42-49. Indeed, Lee explicitly discloses that the secondary carrier could be associated with both uplink and downlink through the use of the DL/UL parameter. Ex. 1005, Table 6 (below); Ex. 1009, ¶163.

Ex. 1005 (Lee), Table 6 (Annotated); Ex. 1009, ¶164.

TABLE 6		
Field	Size (bit)	Description
...		
If (Indication Type #1 == 1){		
Num of target carrier	[TBD]	The number of deactivated carrier(s)
Disconnection time	[TBD]	LSB bits of Superframe number at the time to disconnect the connection with the target carrier(s)
For(i=0; i< Num of target carrier; i++){		
Target carrier index	[TBD]	Target carrier index for deactivation
Deactivation of DL/UL	1	'0': Both DL/UL are deactivated '1': UL is deactivated but DL is kept active
}		
}		
...		

When applying Kim’s teaching about HARQ buffers to situations dealing with both UL and DL secondary carriers, a POSITA would have understood that Kim’s teaching of initializing the HARQ buffer associated with the secondary carrier should be applied to both the UL and DL secondary carriers being deactivated. Ex. 1009, ¶164. Further, as explained in Section VII.D., it was well understood that a base station (or a UE) could have both uplink and downlink HARQ buffers associated with each carrier when carrier aggregation is activated—particularly in the case of TDD where those carriers are shared between uplink and downlink. *Id.* at ¶164; *see also id.* at ¶¶47-49. It would have been obvious to a POSITA then that these uplink and downlink HARQ buffers (or other buffers associated with the secondary carrier) could be treated similarly and initialized or wiped whenever a given secondary carrier is activated or deactivated. *Id.* at ¶164. As such, while Kim’s disclosure discusses the uplink side, a POSITA would have understood and known that its disclosure could be applied to the downlink and base station side as well. *Id.*

Thus, Lee alone or in combination with Kim renders obvious “stopping downlink (DL) data transmission of the secondary carrier and initializing uplink (UL) and DL buffers associated with the secondary carrier after transmitting the deactivation message,” as recited in Claim 1.

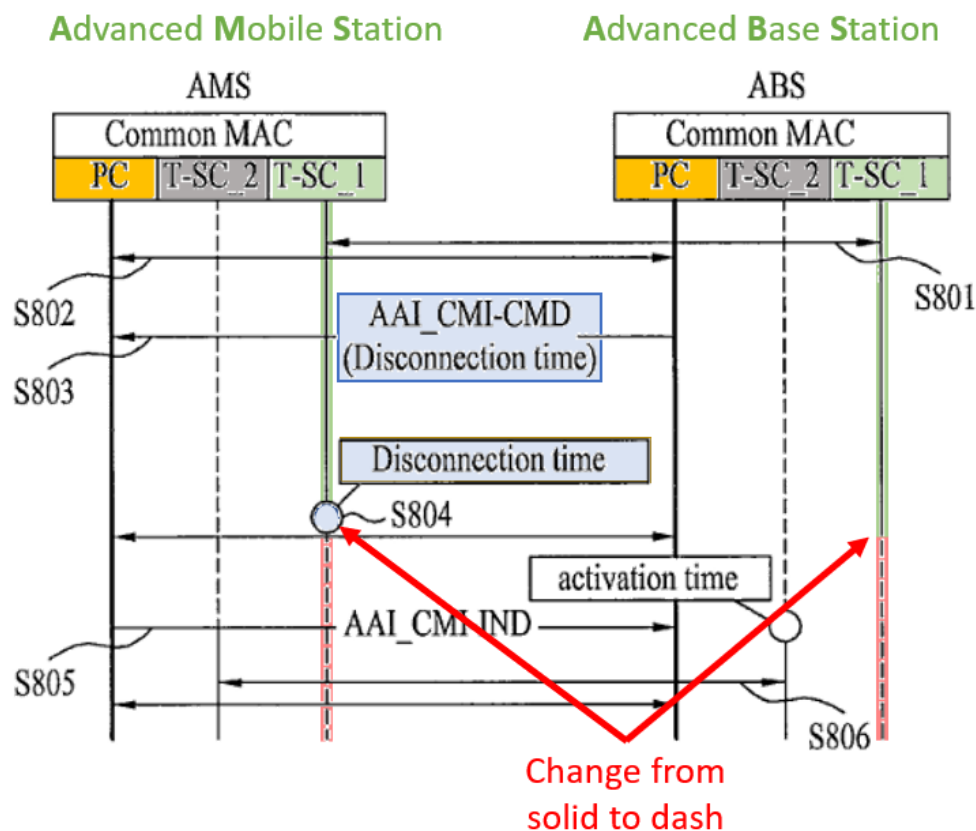
B. Dependent Claim 2

[2] The carrier management method of claim 1, wherein the predetermined time is a value predefined to make state information that is managed by the base station consistent with state information that is managed by the terminal for the secondary carrier.

Claim 2 depends from Claim 1, and thus the discussion above with respect to Claim 1 is incorporated by reference. Furthermore, Lee renders obvious the additional limitations of Claim 2. Ex. 1009, ¶¶166-73.

Figure 8 (below) in Lee shows that its disclosed “disconnection time” is a time determined to make the state information that is managed by the base station consistent with state information that is managed by the terminal for the secondary carrier. Ex. 1005, ¶¶[0159]-[0160], Fig. 8; Ex. 1009, ¶167. As shown in Figure 8 (below), the secondary carriers are deactivated at the same time in the MS and the BS thus making the states consistent (*i.e.*, note the lines for T-SC₁ transition from solid (highlighted in green below) to dashed (highlighted in red below) at the same time). Ex. 1005, Fig. 8; Ex. 1009, ¶168; *see also* Ex. 1005, ¶[0159] (“As can be seen from FIG. 8, the representation of the first target secondary carrier (T-SC₁) is changed from a solid line (activation) to a dotted line (deactivation) at the disconnection time.”)

Ex. 1005 (Lee), Fig. 8 (Annotated); Ex. 1009, ¶¶167-68.



Furthermore, to the extent that Lee does not explicitly disclose Claim 2, Claim 2 would have been obvious to a POSITA. Ex. 1009, ¶169. As explained above, one of the purposes of Lee is to avoid faults in a carrier management procedure (such as carrier activation and/or deactivation) that “may negatively affect communication between the mobile station (MS) and the base station (BS)” or even make it “impossible” to achieve said communication. Ex. 1005, ¶¶[0012]-[0013], [0015]; Ex. 1009, ¶¶170-72. To achieve this goal Lee states, *inter alia*, that “carrier activation and/or deactivation caused by the carrier management command should be achieved at correct time point(s).” Ex. 1005, ¶[0013]; Ex. 1009, ¶¶170-72. As

shown above by Figure 8, a POSITA would have known that the reference to “correct time points” is a reference to ensuring that the states in the base station and UE remain consistent. Ex. 1009, ¶170.

Thus, Lee alone or in combination with Kim renders obvious Claim 2.

C. Dependent Claim 3

[3] The carrier management method of claim 1, further comprising: receiving a reception success message for the deactivation message from the terminal after transmitting the deactivation message, wherein the changing of the secondary carrier to the deactivation state includes changing, by the base station, the secondary carrier to the deactivation state after a predetermined time from an arrival time of the reception success message.

Claim 3 depends from Claim 1, and thus the discussion above with respect to Claim 1 is incorporated by reference. Lee renders obvious the additional limitations of Claim 3. Ex. 1009, ¶¶174-83.

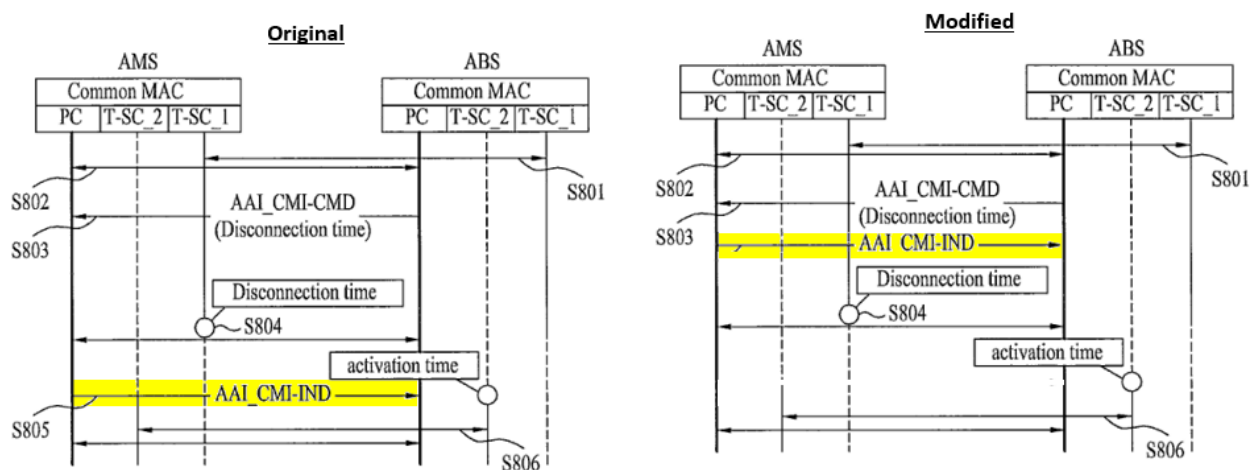
In addition to the AAI-CM_CMD messages described by Lee, Lee also discloses the use of an indication message called: AAI-CM_IND messages. AAI_CM-IND messages are sent to the BS from the MS in response to receiving AAI_CM-CMD messages. Ex. 1005, ¶[0010]; Ex. 1009, ¶176. For example, Lee discloses that the AAI_CM-IND message can be sent “[i]n order to inform the ABS of the successful reception of the AAI_CM-CMD message.” Ex. 1005, ¶[0112]; Ex. 1009, ¶177. Lee also discloses that AAI_MSG-ACK messages can be sent to the base station to acknowledge receipt of the MAC control messages. Ex. 1005, ¶¶[0120]-[0124], [0128]; Ex. 1005, ¶[0139], Fig. 6(b); Ex. 1009, ¶178. Each of these

messages meets the limitation of receiving a reception success message for the deactivation message from the terminal after transmitting the deactivation message.

Ex. 1009, ¶¶178-80.

Moreover, Lee states “[t]he mobile station (MS) transmits the AAI CM IND MAC control message to the base station (BS) through the primary carrier, such that the base station (BS) can confirm that the mobile station (MS) has successfully activated/deactivated the carriers listed in the AAI CM-CMD message.” Ex. 1005, ¶[0097]. Lee further states “the AAI CM-IND message may be used in different ways according to indicated actions.” Ex. 1005, ¶[0109]. It would have been obvious for a POSITA to therefore modify Figure 8 and have the base station wait to deactivate the secondary carrier until after it receives the IND message from the mobile station. Ex. 1009, ¶¶181-82.

Ex. 1005 Fig. 8 (original, left) (annotated, right).



A POSITA would be motivated to modify Figure 8 in the manner above because waiting until after the mobile station responds ensures the base station does not need to reactivate the secondary carrier for any reason until after the UE confirms it has been deactivated on the UE side as well. Ex. 1009, ¶182. For example, waiting for AAI_CMI-IND ensures the mobile station has completed any uplink transmission on the secondary carrier. *Id.*.

Thus, Lee alone or in combination with Kim renders obvious Claim 3.

D. Dependent Claim 4

[4] The carrier management method of claim 1, further comprising: immediately stopping, by the base station, data transmission and retransmission using the secondary carrier immediately after transmitting the deactivation message.

Claim 4 depends from Claim 1, and thus the discussion above with respect to Claim 1 is incorporated by reference. Furthermore, Lee renders obvious the additional limitations of Claim 4. Ex. 1009, ¶¶184-88.

As discussed above, Lee describes multiple different exemplary methods for defining the “disconnection time” it discloses. Ex. 1005, ¶¶[0153]-[0157]; Ex. 1009, ¶185. One of those methods states: “[n]o disconnection time is defined in the AAI_CM-CMD message, and *a reception time of the AAI_CM-CMD message is implicitly defined as a disconnection time of the target carrier.*” Ex. 1005, ¶[0157]; Ex. 1009, ¶185.

A POSITA reading this disclosure would have been motivated to modify the disclosure so that the BS could immediately stop data transmission and retransmission on the secondary carrier immediately after transmitting the deactivation message. Ex. 1009, ¶186. A POSITA would have understood there is no need for the BS to continue to monitor that secondary carrier when there is no disconnection time set. *Id.* This is because Lee describes that the AAI_CM-CMD messages can be sent on the *primary* carrier. Ex. 1005, ¶[0095]; Ex. 1009, ¶186. As such, a POSITA would understand that the BS could immediately deactivate the secondary carrier after transmission given the responsive success message will be returned on the primary carrier, which will remain activated even after the secondary carrier deactivation. Ex. 1009, ¶186. Furthermore, a POSITA would be motivated to do so because doing so would free up resources in the base station that could be reallocated to other mobile equipment. *Id.*

In addition, Lee explains that an advantage of defining a disconnection time is that it helps to prevent the errors that can occur when a time is not defined. Ex. 1005, ¶[0161]; Ex. 1009, ¶187. As such, a POSITA would understand Lee to disclose, or at least render obvious, that prior art systems involved the BS immediately stopping data transmission and retransmission on the secondary carrier immediately after transmitting the deactivation message. Ex. 1009, ¶187.

Thus, Lee alone or in combination with Kim renders obvious Claim 4.

XII. THIS PETITION CONTAINS NEW ARGUMENTS AND PRIOR ART NOT PREVIOUSLY PRESENTED TO THE OFFICE

The prior art cited in the instant petition was not cited and is different from the prior art considered by Examiner during original prosecution of the '662 Patent.

Accordingly, this petition is not redundant to the original examination for purposes of § 325(d).

XIII. *FINTIV* FACTORS IN FAVOR OF INSTITUTION

The Board balances six factors in considering discretionary denial under 35 U.S.C. § 314(a) when parallel litigation exists. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential). Here, the factors (“*Fintiv* factors”) favor institution.

Factor 1—potential stay of the district court litigation—is neutral because no party has requested a stay. *VMWare, Inc. v. Intellectual Ventures I LLC*, No. IPR2020-00470, Paper 13 (P.T.A.B. Aug. 18, 2020), at 17 (finding in the absence of a stay motion that this factor “does not weigh for or against discretionary denial”).

Factor 2—district court trial date and the Board’s statutory deadline— should be considered neutral. The earliest estimated trial date for the district court litigation is far in the future as jury selection in AT&T, T-Mobile, and Verizon is not set to begin until at least October 21, 2024. *See* Ex. 1013 at 1. Because much can change in approximately eight months, the current trial date does not support denial. *See Dish Network v. Broadband iTV*, IPR2020-01280, Paper 17 at 16 (PTAB Feb. 4,

2021) (“We cannot ignore the fact that the currently scheduled trial date is more than nine months away and much can change during this time”).

Factor 3—investment in the district court proceedings—weighs heavily against discretionary denial. The associated district court case is still in the very early stages of litigation: discovery is still in the preliminary stages, the Defendants filed their invalidity contentions in September 2023, and Claim Construction is not scheduled until April 10, 2024. Ex. 1013 at 3-4. Moreover, a claim construction order will not issue prior to the PTAB’s projected institution decision date. Accordingly, the district court will not invest significant resources or issue substantive orders related to the challenged patent prior to the issuance of an institution decision. *See Fintiv*, IPR2020-00019, Paper 11 at 9-12. Regardless, Petitioners diligently prepared this Petition and filed well in advance of the statutory deadline, which weighs against denying institution.

Factor 4—overlap in the parallel proceedings—weighs heavily against discretionary denial. Instituting trial will allow issues to be narrowed in the district court because, if instituted, Petitioner stipulates that it will not pursue invalidity against the asserted claims in the district court using the specific combination of prior art references set forth in the grounds presented in this Petition for purposes of establishing obviousness (*e.g.*, Lee in combination with Kim under § 103). *See Sand Revolution II LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393,

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Paper 24 at 11-12 (PTAB June 16, 2020) (holding a similar stipulation weighs against discretionary denial). Given the lack of overlap between the proceedings, this factor weighs against the Board exercising discretion to deny.

Factor 5—overlapping parties—is neutral as it is “far from an unusual circumstance that a petitioner in *inter partes* review and a defendant in a parallel district court proceeding are the same.” *Sand*, No. IPR2019-01393, Paper 24, at 12-13.

Factor 6—other considerations—weighs against discretionary denial. As explained, the merits of the Petition are strong, and the Challenged Claims are invalid. For example, none of the grounds asserted herein were previously considered by either the Office or the district courts. *Cf. Comcast Cable Comm’n’s, LLC v. Rovi Guides, Inc.*, IPR2019-00231, Paper 14 at 11 (PTAB May 20, 2019) (obviousness challenges not “previously considered by the Office or any court” weigh in favor of not denying institution). Moreover, the ’662 Patent is currently asserted in a district court case. Institution of this IPR provides the opportunity for narrowing and simplifying the litigations for the district court.

Compelling Merits – Finally, discretionary denial is not warranted because this petition presents compelling evidence of unpatentability. Ex. 1014 at 2. Lee in view of Kim presents compelling invalidity arguments with clear disclosures of the

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allegedly novel aspects of the Challenged Claims, particularly in light of Patent Owner's apparent interpretation of the claims.

Accordingly, the Board should decline to exercise its discretion under *Fintiv* and institute trial.

XIV. CONCLUSION

For the reasons provided above, *inter partes* review of Claims 1-4 of the U.S. Patent No. 9,565,662 is requested.

Dated: February 29, 2024

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned Petition for *Inter Partes* Review of U.S. Patent Nos. 9,565,662 specified in 37 C.F.R. § 42.24 have **11,761** words, in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24(a)(1)(i). This word count was prepared using Microsoft Word.

Dated: February 29, 2024

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CERTIFICATION OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))

The undersigned hereby certifies that true and correct copies of the above-captioned **PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NOS. 9,565,662**, all associated exhibits, and Petitioner's Power of Attorney were served in their entirety on February 29, 2024, upon the following parties via FedEx® Ex-press:

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