

Ex. 1028

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TCL Communication Technology Holdings Limited
TCT Mobile International Limited
TCT Mobile, Inc.
TCT Mobile (US) Inc.
TCT Mobile (US) Holdings Inc.,

Petitioners

v.

Mitsubishi Electronic Corporation

Patent Owner.

Case No. IPR2023-00997

U.S. Patent No. US 10,200,976

**DECLARATION OF MARK R. LANNING IN SUPPORT OF
PETITIONERS' REPLY TO PATENT OWNER'S RESPONSE
AND
PETITIONERS' RESPONSE TO MOTION TO AMEND
FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. US 10,200,976**

***Amended Expert Declaration of Mark R. Lanning In Support of
Petition for Inter Partes Review of U.S. Patent No. 10,200,976***

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Exhibit No.	Description
1001	U.S. Patent No. 10,200,976 (“the ’976 patent”)
1002	Excerpts of Prosecution history of U.S. Patent No. 10,200,976 (“Prosecution History”)
1003	Initial Expert Declaration of Mark Lanning
1004	C.V. of Mark R. Lanning
1005	MELCO Complaint for Case No.: 8:22-cv-1073-CJC-DFM.
1006	Exhibit D of MELCO Preliminary Infringement Contentions dated December 16, 2022.
1007	Amended Joint Claim Construction and Prehearing Statement, Case No.: 8:22-cv-1073-CJC-DFM. (Docket 51)
1008	Plaintiffs’ Opening Claim Construction Brief, Case No.: 8:22-cv-1073-CJC-DFM
1009	Defendants’ Opening Claim Construction Brief, Case No.: 8:22-cv-1073-CJC-DFM
1010	Summary of 3GPP Standards Releases for LTE by Alastair Brydon on October 5, 2012.
1011	Reserved
1012	3GPP TS 36.300 V10.0.0 (2010-06). Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 (Release 10).
1013	R2-104515 3GPP LTE Contribution to TSG-RAN WG2 Meeting #71 in Madrid, Spain, August 23 rd – 27 th , 2010.
1014	3GPP TS 25.308 V9.1.0 (2009-09) Specification. High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2 (Release 9).
1015	3GPP TS 25.319 V9.1.0 (2009-09) Specification. Enhanced uplink; Overall description; Stage 2 (Release 9), aka, High Speed Uplink Packet Access (HSUPA).
1016	LTE: Carrier Aggregation Tutorial Tweet4Technology: LTE 5G-NR Wireless Technology Blogs. November 2, 2016. NOT PRIOR ART.
1017	About the 3GPP webpages saved on 4/25/2021.

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Exhibit No.	Description
1018	3GPP Working Procedures webpages saved on 4/25/2021.
1019	3GPP Delegates Corner webpages saved on 4/25/2021.
1020	3GPP FAQs webpages saved on 4/25/2021.
1021	Overview of 3GPP Release 9 V0.1.1 (2010-09).
1022	3GPP Description of Releases (including Ex. 1021). https://www.3gpp.org/ftp/Information/WORK_PLAN/Description_Releases/Previous_versions .
1023	U.S. Patent Publication No. 2006/0274712 A1 to Malladi et al. (“Malladi”)
1024	3GPP TS 36.300 V11.2.0 (2012-06). 3GPP; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2 (Release 11)
1025	3GPP TSGR2-#71 Meeting Docs List. R2-104515 is included.
1026	Report of TSG RAN WG2 #71, Madrid, Spain, August 23 – 27, 2010. https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_71/Report/_R2-106031.zip
1027	Fintiv stipulation
1028	This Amended Expert Declaration.
1029	Patent Owner’s Response
1030	3GPP TSG-RAN WG4 Meeting #65 CR R4-126923.
1031	Carrier Aggregation explained submitted to 3GPP on June 2013
1032	Understanding Carrier Aggregation by Anritsu
1033	3GPP TS 36.101 V8.11.0 (2010-10)
1034	Phone Scoop Band 29. https://www.phonescoop.com/glossary/term.php?gid=561 .

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Exhibit No.	Description
1035	A Guide to Cellular Frequency Bands Used by US Carriers. https://www.kajeet.com/en/blog/a-guide-to-cellular-frequency-bands-used-by-us-carriers
1036	3GPP TS 36.331 V9.4.0 (Non-Patent Document 2)

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I, Mark R. Lanning, declare as follows:

I. INTRODUCTION

1. My name is Mark R. Lanning, and I have been retained by the Petitioners to offer technical opinions relating to U.S. Patent No. 9,635,656 (“the ’976 patent”) and prior art references relating to its subject matter. My extensive experience with 2G, 3G and 4G LTE cellular networks and their standards provides me with an understanding of the subject matter described and claimed in the ’976 patent.

2. My opinions in this declaration are based on my education, experience, and expertise in the fields relating to the ’976 patent. Any figures that appear within this document have been prepared with the assistance of Counsel and reflect my understanding of the ’976 patent and the prior art discussed below.

3. I have no financial interest in the party or in the outcome of this proceeding. I am being compensated for my work as an expert on an hourly basis. My compensation is not dependent on the outcome of these proceedings or the content of my opinions.

II. PROFESSIONAL BACKGROUND AND QUALIFICATIONS

4. In my initial declaration.

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III. DOCUMENTS AND OTHER MATERIALS REVIEWED

5. In forming the opinions set forth in this declaration, I have reviewed the documents Identified in the Exhibit List, the prosecution history of the '976 patent and the patents and patent applications to which it claims priority, the Institution Decision, and Patent Owner's Response and its Exhibits.

6. Additionally, I have utilized my own experience and expertise, including that regarding the knowledge and capabilities of a person of ordinary skill in the relevant art in the timeframe of the claimed priority date of the '976 patent.

IV. UNDERSTANDING OF THE LAW

7. In my initial declaration.

V. LEVEL OF ORDINARY SKILL

8. In my initial declaration.

VI. CLAIM CONSTRUCTION

9. In my initial declaration.

VII. OVERVIEW OF ADDITIONAL PRIOR ART

10. The description of the Prior Art used is in my initial declaration.

11. The additional versions of 3GPP specifications used are described in their respective sections below.

**VIII. REBUTTAL FOR GROUND 1: CLAIM 2 OF THE '976 PATENT IS
STILL UNPATENTABLE UNDER 35 U.S.C. §103 OVER TS 36.300
V10.0.0 MODIFIED IN VIEW OF R2-104515**

12. Claim 2 states:

A communication terminal device performing radio communication with a base station device, wherein the communication terminal device performs uplink communication using an associated cell configured by the base station to include a resource for uplink and a resource for downlink, the resource for uplink being allocated to the uplink communication to the base station device, the resource for downlink being allocated to the downlink communication from the base station device, and the communication terminal device performs downlink communication using the associated cell and a non-associated cell configured by the base station to include only another resource for downlink, the other resource for downlink being allocated to the downlink communication from the base station device.

Ex. 1001, Claim 2.

13. The rationale provided by the PO in its POR and the MTA for Ground 1 is incorrect and Claim 2 of the '976 patent is still unpatentable under 35 U.S.C. §103 over TS 36.300 v10.0.0 modified in view of R2-104515 for the reasons stated in my initial declaration and the following additional reasons.

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A. TS 36.300 Does Disclose that the Base Station Can Configure the Non-Associated Cell to Have Only a Downlink Resource in Multiple Sections

14. The POR states that “neither TS 36.300 nor R2-104515 discloses or suggests that the base station configures the “non-associated cell” to have only a downlink resource.” POR p. 16. I disagree for at least the following additional reasons.

15. First, the PO is stating “TS 36.300, as of the priority date of the ’976 Patent, did not disclose or suggest a “non-associated cell” configured by the base station to have only a downlink resource allocated.” *Id.* To support this statement the PO is offering a “red herring” argument regarding the predetermined Operating Band pairs that are defined by the TS 36.101 Specification. This is a red herring argument because these predetermined Operating Band pairs are not the *resource for uplink* and a *resource for downlink configured by the base station* for the associated cell and *only another resource for downlink configured by the base station for the non-associated cell*. In other words, this predetermined list does not configure anything, the base station does. Even though these operating bands are listed as pairs for situations where both an uplink and downlink resource are needed, this list does not prohibit the base station from configuring just the downlink frequency band when only a downlink resource is needed.

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16. The available operating band frequencies has evolved over time from a small list of frequencies that were available for the initial first generation (1G) cellular networks in the 1980s to a much larger list today as shown in Table 5.5-1 of TS 36.101 version 11.3.0. *See e.g.* POR p. 25. These frequencies are allocated and licensed by the U.S. Federal Communications Commission (FCC) and, as the demand for additional cellular network capacity and coverage has increased, the FCC has reassigned frequencies used by other radio services to cellular networks. For example, I recall the cellular frequencies used initially by cellular networks were in the 800 MHz band and later the FCC added additional frequency bands in the 1,800 MHz range.

17. Some key points regarding the defined frequency bands in Table 5.5-1 that the PO or its expert did not include are: (1) a cellular carrier is only allowed to use some of the defined operating bands; (2) an operating band licensed to a cellular carrier in one geographic area may not be available to it in other areas; and (3) many of the operating bands have been defined by the FCC to minimize possible interference with other operating bands and/or with other non-cellular spectrum.

18. A cellular network operator cannot use all the defined operating bands in this table because the FCC has divided the available frequency spectrum into hundreds of geographic areas and, in order for a cellular network operator to use an operating band in one of these areas, it must win a licensing bid against other cellular

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operators. For example, for a specific geographic area, AT&T may have a license to some of these operating bands, Verizon may have a license for some of the other operating bands and T-Mobile may have a license for the remaining operating bands. For a different geographic area, the owner of the licensed operating bands may change.

19. Therefore, the base station required in Claim 2 can only allocate a portion of the operating bands that are listed in Table 5.5-1 and the available operating bands can be different for another base station in a different geographic area that is operated by the same cellular network operator. Thus, the list operating bands in Table 5.5-1 is not doing the required configurations and allocations of Claim 2. Instead, it is the base station sending configuration commands to the UE as described below.

20. As I describe in detail in my initial declaration, the TS 36.300 Specification does disclose that the base station (eNodeB or eNB) can configure an associated cell (PCell) by allocating an uplink resource and a downlink resource it to and it can configure a non-associated cell (SCell) by only allocating a downlink resource to it.

21. The PO is also incorrect when it states that the “frequency bands are always assigned for both the downlink and uplink” as included below:

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According to TS 36.101 V10.0.0, the resources provided by the frequency bands are always assigned for both downlink and uplink when the base station configures the cell. Conversely, according to TS 36.101 V10.0.0 where every frequency band has paired UL and DL resources, it is not possible for the base station to configure the cell by assigning a resource for downlink without also assigning a resource for uplink at the same time. A POSITA would therefore have concluded, as of October 2010, that Release 10 including TS 36.300 V10.0.0 (EX1012) did not disclose or suggest the concept of a “non-associated cell” configured by a base station to have downlink resources only. EX2005, ¶57. POR pp. 22-23 (emphasis added).

22. This statement is not true, a base station can allocate only the downlink frequency of an operating band, as supported by at least Section 7.5 of TS 36.300, which directly contradicts the above PO’s statement. The highlighted portion below defines the number of downlink and uplink *resources*, referred to as component carriers (CCs), the base station can *configure* for the PCell (*associated cell*) and the SCell (*non-associated cell*). The phrase “the number of DL SCCs configured is therefore always larger or equal to the number of UL SCCs” clearly states, that when the number of downlink SCCs is one, as required by claim 2, the number of UL SCCs can either be one or zero. Thus, zero UL SCCs meets the claim 2 limitation of *a non-associated cell configured by the base station to include only another resource for downlink*. When considered in combination with other Sections of TS 36.300

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V10.0.0, such as pages 49 and 107-108 relating to the RBC functionality, a POSITA would have understood that in LTE Carrier Aggregation a base station can configure a single non-associated cell (SCell) allocated with only one downlink resource (DL SCC=1) and no uplink resource (UL SCC=0). This is because in a non-associated cell (SCell) the number of DL SCCs is “always larger or equal to the number of UL SCCs.” In this case, for the non-associated cell, the number of DL SCCs = 1 would be larger than the number of the UL SCCs = 0.

7.5 Carrier Aggregation

When CA is configured, the UE only has one RRC connection with the network. At RRC connection establishment/re-establishment, one serving cell provides the security input (one ECGI, one PCI and one ARFCN) and the NAS mobility information (e.g. TAI) similarly as in Rel-8/9. This cell is referred to as the Primary Serving Cell (PCell). In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).

Depending on UE capabilities, Secondary Serving Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).

The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:

- For each SCell the usage of uplink resources by the UE in addition to the downlink ones is configurable (the number of DL SCCs configured is therefore always larger or equal to the number of UL SCCs and no SCell can be configured for usage of uplink resources only);
- The number of serving cells that can be configured depends on the aggregation capability of the UE (see subclause 5.5);
- PCell can only be changed with handover procedure (i.e. with security key change and RACH procedure);

NOTE: PCell change optimisations (e.g. not involving a handover procedure) are FFS.

- PCell is used for transmission of PUCCH;
- Unlike SCells, PCell cannot be de-activated (see subclause 12.1);
- Re-establishment is triggered when PCell experiences RLF, not when SCells experience RLF;
- NAS information is taken from PCell.

The reconfiguration, addition and removal of SCells can be performed by RRC. At intra-LTE handover, RRC can also add, remove, or reconfigure SCells for usage with the target PCell. When adding a new SCell, dedicated RRC signalling is used for sending the system information of the SCell required for transmission/reception (similarly as in Rel-8/9 for handover).

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Ex. 1012 at p. 49 (Section 7.5 of TS 36.300 V10.0.0, highlighting added).

23. Section 5.5 of TS 36.300 also supports the fact that more aggregate downlink resources (DL CCs) can be configured than the aggregate uplink resources (UL CCs). The text below clearly states at least two key facts: (1) the base station (eNB) can configure a different number of CCs in the UL and DL; and (2) It is not possible to configure a UE with more UL CCs than DL CCs. Therefore, if the number of aggregate DL CCs and UL CCs configured by the base station are different, the number of UL CCs needs to be less than the number of DL CCs because it cannot be more. Applied to Claim 2 and the Amended Claim, if the aggregate number of DL CCs is two (one for the associated cell and one for the non-associated cell), then the number of UL CCs can only be one. This is also another example of an LTE base station (eNodeB) configuring half of a frequency pair defined by an operating band.

It is possible to configure a UE to aggregate a different number of CCs originating from the same eNB and of possibly different bandwidths in the UL and the DL.

- The number of DL CCs that can be configured depends on the DL aggregation capability of the UE;
- The number of UL CCs that can be configured depends on the UL aggregation capability of the UE;
- It is not possible to configure a UE with more UL CCs than DL CCs;
- In typical TDD deployments, the number of CCs and the bandwidth of each CC in UL and DL is the same.

Ex. 1012 p. 39 (highlighting added).

24. Section 11 of TS 36.300 also discloses that a SCell (*non-associated cell*) can be configured without an uplink resource. The title of Section 11 is “Scheduling

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and Rate Control” and it describes the “Basic Scheduler Operation” as “MAC in eNB includes dynamic resource schedulers that allocate physical layer resources for the DL-SCH and UL-SCH transport channels.” A POSITA would have understood MAC to be the acronym for the Medium Access Control layer 2 protocol and the DL-SCH and UL-SCH are acronyms for the DownLink Shared CHannel and the UpLink Shared CHannel. Ex. 1012 *See e.g.*, pp. 39-43, x and 37-38. The DL-SCH and UL-SCH are transport channels used, *inter alia*, to carry user data on the downlink and uplink, respectively. In regard to Claim 2 and the Amended Claim, the DL-SCH is a *downlink resource*, and the UL-SCH is an *uplink resource*, and both of these are configured by the base station (eNodeB or eNB). For CA the MAC resource scheduling is described as follows. The highlighted line below discloses that an uplink resource is not required for an SCell (*non-associated cell*) because it describes what the SCell should do if it receives an UL grant message, which is to ignore it.

When CA is configured, a UE may be scheduled over multiple serving cells simultaneously but at most one random access procedure shall be ongoing at any time. Cross-carrier scheduling with the Carrier Indicator Field (CIF) allows the PDCCH of a serving cell to schedule resources on another serving cell. A linking between UL and DL allows identifying the serving cell for which the grant applies when the CIF is not present:

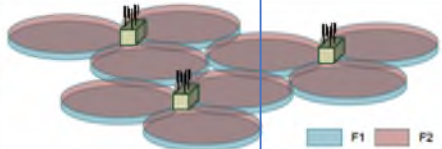
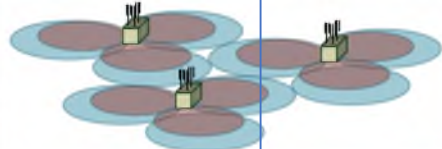
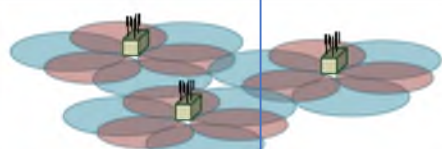
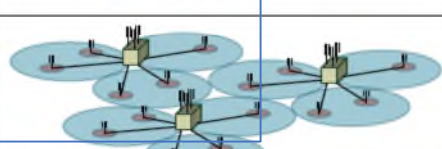
- DL assignment received in PCell corresponds to downlink transmission in PCell;
- UL grant received in PCell corresponds to uplink transmission in PCell;
- DL assignment received on in SCell_n corresponds to downlink transmission on in SCell_n;
- UL grant received in SCell_n corresponds to uplink transmission in SCell_n. If SCell_n is not configured for uplink usage by the UE, the grant is ignored by the UE.

Id. p. 82 (highlighting added).

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25. The TS 36.300 Specification also includes an Annex J.1 section, which includes Table J.1-1 shown below, and is dedicated to describing potential CA deployment scenarios. It discloses five different CA configuration scenarios where the first frequency for the PCell (*associated cell*) is referred to as F1 and the second frequency for the SCell (*non-associated cell*) is referred to as F2. F1 and F2 can be allocated by a base station (eNodeB or eNB) in the same frequency band or different frequency bands as described for each of these scenarios. Therefore, based on the stated requirements for uplink and downlink component carriers described in at least Sections 5.5, 7.5 and 11, a base station can allocate just the downlink part of a predetermined operating band.

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J.1 Deployment Scenarios		
Table J.1-1 shows some of the potential deployment scenarios for CA. In Rel-10, for the uplink, the focus is laid on the support of intra-band carrier aggregations (e.g. scenarios #1, as well as scenarios #2 and #3 when F1 and F2 are in the same band). For the downlink, all scenarios should be supported in Rel-10.		
Table J.1-1: CA Deployment Scenarios (F2 > F1).		
#	Description	Example
1	F1 and F2 cells are co-located and overlaid, providing nearly the same coverage. Both layers provide sufficient coverage and mobility can be supported on both layers. Likely scenario when F1 and F2 are of the same band, e.g., 2 GHz, 800 MHz, etc. It is expected that aggregation is possible between overlaid F1 and F2 cells.	
2	F1 and F2 cells are co-located and overlaid, but F2 has smaller coverage due to larger path loss. Only F1 provides sufficient coverage and F2 is used to provide throughput. Mobility is performed based on F1 coverage. Likely scenario when F1 and F2 are of different bands, e.g., F1 = {800 MHz, 2 GHz} and F2 = {3.5 GHz}, etc. It is expected that aggregation is possible between overlaid F1 and F2 cells.	
3	F1 and F2 cells are co-located but F2 antennas are directed to the cell boundaries of F1 so that cell edge throughput is increased. F1 provides sufficient coverage but F2 potentially has holes, e.g., due to larger path loss. Mobility is based on F1 coverage. Likely scenario when F1 and F2 are of different bands, e.g., F1 = {800 MHz, 2 GHz} and F2 = {3.5 GHz}, etc. It is expected that F1 and F2 cells of the same eNB can be aggregated where coverage overlap.	
4	F1 provides macro coverage and on F2 Remote Radio Heads (RRHs) are used to provide throughput at hot spots. Mobility is performed based on F1 coverage. Likely scenario when F1 and F2 are of different bands, e.g., F1 = {800 MHz, 2 GHz} and F2 = {3.5 GHz}, etc. It is expected that F2 RRHs cells can be aggregated with the underlying F1 macro cells.	
5	Similar to scenario #2, but frequency selective repeaters are deployed so that coverage is extended for one of the carrier frequencies. It is expected that F1 and F2 cells of the same eNB can be aggregated where coverage overlap.	

Ex. 1012 p. 176 (highlighting added).

B. The '976 Patent Concedes That The LTE Standard Defined a CA Configuration with Less Total Uplinks Than Downlinks

26. The passage shown below from the '976 Patent concedes a relevant fact that is currently in dispute regarding the disclosure of the prior art LTE TS 36.300 Specification and other LTE prior art specifications. It states that, for Carrier Aggregation (CA) configurations, the number of uplink resources allocated by the

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base station (eNodeB or eNB) is less the number of downlink resources. The CC in the below passage stands for Component Carriers where each CC is defined as a separate resource for either the downlink or the uplink. Specifically, the passage of “[t]he UE cannot configure the number of uplink CCs (UL CCs) equal to or more than the number of downlink CCs (DL CCs).” The reason the UE “cannot configure” is because it is programmed with the stated configuration rules, but the base station is doing the allocations and sending the configurations to the UE.

A Release 8 or 9-compliant UE, which supports LTE, is capable of transmission and reception on only the CC corresponding to one serving cell. On the other hand, it is conceivable that a Release 10-compliant UE may have the capability of transmission and reception, only reception, or only transmission on the CCs corresponding to a plurality of serving cells at the same time.

Each CC employs the configuration of Release 8 or 9, and the CA supports contiguous CCs, non-contiguous CCs, and CCs in different frequency bandwidths. The UE cannot configure the number of uplink CCs (UL CCs) equal to or more than the number of downlink CCs (DL CCs). The CCs configured by the same eNBs do not need to provide the same coverage. The CC is compatible with Release 8 or 9.

Ex. 1001 9:10-23 (highlighting added).

27. Using the same arithmetic as for the similar statements made in the LTE Specifications, if the number of downlink resources is two (one for the associated cell and one for the non-associated cell), then the number of uplink resources needs to be one or zero.

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**C. The Patent Owner's Infringement Contentions Regarding TS 36.300
Conflict With its Current Interpretation in its POR.**

28. Significantly, before its POR, the PO interpreted the above disclosures in the same way that I believe a POSITA would have interpreted them as described below and in my initial declaration.

29. My initial declaration includes the facts that the PO has cited a description almost identical to Section 7.5 of TS 36.300 for its infringement contentions in the District Court litigation against the Petitioner for the purpose of showing that Accused Instrumentalities meet the limitations of claim 2. The PO has not reconciled the conflict between its infringement contentions and its contrary statements about Section 7.5 in the POR. The PO is now interpreting TS 36.300 one way to defend validity of claim 2 and interpreting the language differently in its contentions of infringement.

30. Specifically, the Patent Owner has used Section 7.5 from a more recent version of TS 36.300 (V11.2.0) to show infringement as shown below by a part of its Infringement Contentions.

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US 10,200,976 – Claim 2	Illustrative Sections of relevant 3GPP Specification to which the Accused Instrumentalities are compliant
the communication terminal device performs downlink communication using the associated cell and a non-associated cell configured by the base station to include only another resource for downlink, the other resource for downlink being allocated to the downlink communication from the base station device.	The Accused Instrumentalities are communication terminal devices configured to perform downlink communication using the associated cell and a non-associated cell configured by the base station to include only another resource for downlink, the other resource for downlink being allocated to the downlink communication from the base station device. Specifically, the Accused Instrumentalities satisfy these elements because they must be compliant with the following Specifications: As noted in TS 36.300, Section 7.5, for carrier aggregation (CA), a UE may be configured with one PCell and one or more SCells, and the number of downlink SCCs (secondary component channels) is always greater than or equal to the number of uplink SCCs (therefore, there may be one uplink band (“resource”) and two downlink bands (“resources”), of which one may be configured from a SCell). TS 36.331, Section 4.2.1 establishes that the function of allocating these resources is performed by the network and, therefore, via the eNB.
	Relevant Sections of the Standard: The sections of the standard cited in conjunction with elements (a) and (b) are also relevant to element (c). The following further sections of the standard are also relevant to element (c).
	Relevant Sections of TS 36.300 v11.2.0: 7 RRC 7.5 Carrier Aggregation When CA is configured, the UE only has one RRC connection with the network. At RRC connection establishment/re-establishment/handover, one serving cell provides the NAS mobility information (e.g. TAI), and at RRC connection re-establishment/handover, one serving cell provides the security input. This cell is referred to as the Primary Cell (PCell). In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component

Ex. 1006 at pp. 22-24 (only first page of support included) (Highlighting added).

31. The following two captions are the complete Section 7.5 from the two versions of the TS 36.300 Specification. The first caption is from V10.0.0, used as prior art in this declaration, and the second caption is from V11.2.0, used in the Patent Owner’s Infringement Contentions. I have highlighted the text the Patent Owner is referring to in both captions. The highlighted text for both captions below is essentially the same, if not identical. The non-highlighted text of the whole Section 7.5 is also essentially the same.

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7.5 Carrier Aggregation

When CA is configured, the UE only has one RRC connection with the network. At RRC connection establishment/re-establishment, one serving cell provides the security input (one ECGI, one PCI and one ARFCN) and the NAS mobility information (e.g. TAI) similarly as in Rel-8/9. This cell is referred to as the Primary Serving Cell (PCell). In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).

Depending on UE capabilities, Secondary Serving Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).

The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:

- For each SCell the usage of uplink resources by the UE in addition to the downlink ones is configurable (the number of DL SCCs configured is therefore always larger or equal to the number of UL SCCs and no SCell can be configured for usage of uplink resources only);

- The number of serving cells that can be configured depends on the aggregation capability of the UE (see subclause 5.5);
- PCell can only be changed with handover procedure (i.e. with security key change and RACH procedure);

NOTE: PCell change optimisations (e.g. not involving a handover procedure) are FFS.

- PCell is used for transmission of PUCCH;
- Unlike SCells, PCell cannot be de-activated (see subclause 12.1);
- Re-establishment is triggered when PCell experiences RLF, not when SCells experience RLF;
- NAS information is taken from PCell.

The reconfiguration, addition and removal of SCells can be performed by RRC. At intra-LTE handover, RRC can also add, remove, or reconfigure SCells for usage with the target PCell. When adding a new SCell, dedicated RRC signalling is used for sending the system information of the SCell required for transmission/reception (similarly as in Rel-8/9 for handover).

Ex. 1012 at p. 49 (Section 7.5 of TS 36.300 V10.0.0, highlighting added).

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7.5 Carrier Aggregation

When CA is configured, the UE only has one RRC connection with the network. At RRC connection establishment/re-establishment/handover, one serving cell provides the NAS mobility information (e.g. TAI), and at RRC connection re-establishment/handover, one serving cell provides the security input. This cell is referred to as the Primary Cell (PCell). In the downlink, the carrier corresponding to the PCell is the Downlink Primary Component Carrier (DL PCC) while in the uplink it is the Uplink Primary Component Carrier (UL PCC).

Depending on UE capabilities, Secondary Cells (SCells) can be configured to form together with the PCell a set of serving cells. In the downlink, the carrier corresponding to an SCell is a Downlink Secondary Component Carrier (DL SCC) while in the uplink it is an Uplink Secondary Component Carrier (UL SCC).

The configured set of serving cells for a UE therefore always consists of one PCell and one or more SCells:

- For each SCell the usage of uplink resources by the UE in addition to the downlink ones is configurable (the number of DL SCCs configured is therefore always larger than or equal to the number of UL SCCs and no SCell can be configured for usage of uplink resources only);
- From a UE viewpoint, each uplink resource only belongs to one serving cell;
- The number of serving cells that can be configured depends on the aggregation capability of the UE (see subclause 5.5);
- PCell can only be changed with handover procedure (i.e. with security key change and RACH procedure);
- PCell is used for transmission of PUCCH;
- Unlike SCells, PCell cannot be de-activated (see subclause 11.2);
- Re-establishment is triggered when PCell experiences RLF, not when SCells experience RLF;
- NAS information is taken from PCell.

The reconfiguration, addition and removal of SCells can be performed by RRC. At intra-LTE handover, RRC can also add, remove, or reconfigure SCells for usage with the target PCell. When adding a new SCell, dedicated RRC signalling is used for sending all required system information of the SCell i.e. while in connected mode, UEs need not acquire broadcasted system information directly from the SCells.

Ex. 1024 at p. 56 (Section 7.5 of TS 36.300 V11.2.0, highlighting added).

32. Therefore, I still believe that a POSITA would have interpreted these specifications to disclose that a base station can configure an associated cell by *allocating uplink and downlink resources for the associated cell* (PCell) and configure a non-associated cell by only allocating a *downlink resource for the non-associated cell* (SCell).

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**D. The PO is Incorrect Regarding the Timely Disclosure of at least the
LTE Specifications TS 36.100 and TS 36.101.**

33. The PO owner states that “the 3GPP standard did not contemplate, disclose, or suggest a base station configuring a cell with downlink resources only is confirmed by TS 36.101 V11.3.0 (EX2009), published in December 2012, nearly two years after the ’976 Patent priority date.” POR p. 24. I disagree for the same reasons stated in Section VIII.A, above, regarding the PO’s “red herring” argument regarding Table 5.5-1 in TS 36.101. Again, Claim 2 does not require a frequency band comprising a predetermined list of Operating Bands as the PO now contends. Thus, the date this table of Operating Bands was published in LTE specification is irrelevant to Claim 2.

**E. Using Band 29 For Support Its Argument for the Non-disclosures of
TS 36.101 Is Another Red Herring Argument by the PO**

34. The PO is using the recently added Operating Band 29 to compare with a disclosure in the ’976 Patent for its validity the operating band configuration shown in Fig. 41 of the ’976 Patent.” POR p. 26. This is wrong for at least two reasons.

35. First, as described in detail below, Band 29 is owned by AT&T and cannot be used by the other LTE carriers, and it may not even be used by all the base stations (eNodeBs) in AT&T’s LTE network. Thus, Band 29 was not added to the standard to support special downlink only cases of CA as the PO and its expert contends. If it was added for this reason, it would have been added to the LTE

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requirements in a way that it pertained to all base stations and UEs in all the LTE networks and not just to AT&T's LTE network. Instead, as also described in detail below, Band 29 was not allocated an uplink frequency band because the allocation would have interfered with the previously defined uplink frequency for Band 12. Furthermore, if a base station needs an uplink resource for CA when using Band 29 as the downlink resource, the base station can allocate at least Band 12 for the uplink resource, so Band 29 is not restrictive to downlink only CA resources as the PO contends.

36. The Patent Owner attempts to support its flawed logic regarding the addition of Band 29 and the Third Embodiment of the '976 Patent with the following:

TS 36.101 did not disclose assigning downlink resources only to an operating band until well after the priority date of the '976 Patent. That the 3GPP standard did not contemplate, disclose, or suggest an operating band having downlink resources only is confirmed by TS 36.101 V11.3.0 (EX2009), published in December 2012, nearly two years after the '976 Patent priority date. ***For the first time, the 3GPP in this version of TS 36.101 identifies an operating band in which only downlink resources are assigned. EX2011, 44.*** (emphasis added).

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Table 5.5-1 E-UTRA operating bands

E-UTRA Operating Band	Uplink (UL) operating band BS receive UE transmit	Downlink (DL) operating band BS transmit UE receive	Duplex Mode
	F _{UL,low} – F _{UL,high}	F _{DL,low} – F _{DL,high}	
1	1920 MHz – 1980 MHz	2110 MHz – 2170 MHz	FDD
2	1850 MHz – 1910 MHz	1930 MHz – 1990 MHz	FDD
3	1710 MHz – 1785 MHz	1805 MHz – 1880 MHz	FDD
4	1710 MHz – 1755 MHz	2110 MHz – 2155 MHz	FDD
5	824 MHz – 849 MHz	869 MHz – 894 MHz	FDD
6 ¹	830 MHz – 840 MHz	875 MHz – 885 MHz	FDD
7	2500 MHz – 2570 MHz	2620 MHz – 2690 MHz	FDD
8	880 MHz – 915 MHz	925 MHz – 960 MHz	FDD
9	1749.9 MHz – 1784.9 MHz	1844.9 MHz – 1879.9 MHz	FDD
10	1710 MHz – 1770 MHz	2110 MHz – 2170 MHz	FDD
11	1427.9 MHz – 1447.9 MHz	1475.9 MHz – 1495.9 MHz	FDD
12	699 MHz – 716 MHz	729 MHz – 746 MHz	FDD
13	777 MHz – 787 MHz	746 MHz – 756 MHz	FDD
14	788 MHz – 798 MHz	758 MHz – 768 MHz	FDD
15	Reserved	Reserved	FDD
16	Reserved	Reserved	FDD
17	704 MHz – 716 MHz	734 MHz – 746 MHz	FDD
18	815 MHz – 830 MHz	860 MHz – 875 MHz	FDD
19	830 MHz – 845 MHz	875 MHz – 890 MHz	FDD
20	832 MHz – 862 MHz	791 MHz – 821 MHz	FDD
21	1447.9 MHz – 1462.9 MHz	1495.9 MHz – 1510.9 MHz	FDD
22	3410 MHz – 3490 MHz	3510 MHz – 3590 MHz	FDD
23	2000 MHz – 2020 MHz	2180 MHz – 2200 MHz	FDD
24	1626.5 MHz – 1660.5 MHz	1525 MHz – 1559 MHz	FDD
25	1850 MHz – 1915 MHz	1930 MHz – 1995 MHz	FDD
26	814 MHz – 849 MHz	859 MHz – 894 MHz	FDD
27	807 MHz – 824 MHz	852 MHz – 869 MHz	FDD
28	703 MHz – 748 MHz	758 MHz – 803 MHz	FDD
29	N/A	717 MHz – 728 MHz	FDD ²

33	1900 MHz – 1920 MHz	1900 MHz – 1920 MHz	TDD
34	2010 MHz – 2025 MHz	2010 MHz – 2025 MHz	TDD
35	1850 MHz – 1910 MHz	1850 MHz – 1910 MHz	TDD
36	1930 MHz – 1990 MHz	1930 MHz – 1990 MHz	TDD
37	1910 MHz – 1930 MHz	1910 MHz – 1930 MHz	TDD
38	2570 MHz – 2620 MHz	2570 MHz – 2620 MHz	TDD
39	1880 MHz – 1920 MHz	1880 MHz – 1920 MHz	TDD
40	2300 MHz – 2400 MHz	2300 MHz – 2400 MHz	TDD
41	2496 MHz – 2690 MHz	2496 MHz – 2690 MHz	TDD
42	3400 MHz – 3600 MHz	3400 MHz – 3600 MHz	TDD
43	3600 MHz – 3800 MHz	3600 MHz – 3800 MHz	TDD
44	703 MHz – 803 MHz	703 MHz – 803 MHz	TDD
NOTE 1: Band 6 is not applicable			
NOTE 2: Restricted to E-UTRA operation when carrier aggregation is configured. The downlink operating band is paired with the uplink operating band (external) of the carrier aggregation configuration that is supporting the configured Pcell.			

EX2009, 21-23.

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As shown in Table 5.5-1 above, operating band 29 (highlighted in yellow) has only downlink resources assigned. ***Notably, operating band 29 in TS 36.101 V11.3.0 mirrors the operating band configuration shown in Fig. 41 of the '976 Patent.***

F I G . 4 1

Band	Uplink (UL) operating Band	Downlink (DL) operating Band	Duplex Mode
	FUL_low — FUL_high	FDL_low — FDL_high	
A	—	FB_DL_l — FB_DL_h	FDD

Just like operating band 29 in TS 36.101 V11.3.0, the operating band in Fig. 41 of the '976 Patent has no uplink resources assigned. EX2011, ¶44. (emphasis added).

Accordingly, as shown by the progression of TS 36.101 over time, not until December 2012 does the 3GPP standard ***disclose for the first time an operating band assignment consistent with a “non-associated cell” being configured by the base station to include only another resource for downlink that is “included in a second downlink frequency band that is not paired with any uplink frequency band,”*** as recited in substitute claim 3. In every instance prior to December 2012, the 3GPP standard included assignments pairing uplink and downlink frequency bands for every operating band. EX2011, ¶45. (emphasis added).

Id. “2.” on pp. 14-16. See also similar statements to above in POR pp. 17-30.

37. These statements regarding Band 29 are wrong and misleading for at least the following reasons:

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- Band 29 is a band that AT&T owns, and it has not been allocated an uplink frequency due to an overlapping frequency conflict with Band 12 and not, as the Patent Owner claims, created to support CA configurations that do not require a secondary uplink resource; and
- Band 29 is only used by AT&T and, therefore, cannot be used by any of the other LTE cellular carriers, e.g., Verizon and T-Mobile. Thus, Band 29 is not to support a new CA configuration for all base stations and UEs.

38. The Change Request (CR) below is one of many change requests that were submitted by AT&T and eNodeB suppliers Ericsson, and Nokia. This CR is to modify TS 36.101 for the introduction of the new Band 29. The other CRs submitted are similar to this one and are requesting similar Band 29 modifications to other relevant LTE Specifications. As described below, the reason an uplink frequency range was not allocated for Band 29 is “due to BS-BS coexistence with Band 12” and is not to support DL only CA configurations as the Patent Owner and/or its expert contends.

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3GPP TSG-RAN WG4 Meeting #65 New Orleans, USA, 12-16 November 2012		# R4-126923
CHANGE REQUEST		CR-Form-v10
# 36.101 CR 1490 # rev 1 # Current version: 11.2.0 #		
For HELP on using this form look at the pop-up text over the # symbols. Comprehensive instructions on how to use this form can be found at http://www.3gpp.org/Change-Requests .		
Proposed change affects: # UICC apps# ☐ ME ☒ Radio Access Network ☐ Core Network ☐		
Title: # Introduction of Band 29		
Source to WG: # Ericsson, ST-Ericsson, AT&T, Nokia Corporation		
Source to TSG: # R4		
Work item code: # LTE_DL_FDD700-Core		Date: # 2012-11-12
Category: # B		Release: # Rel-11
Use <u>one</u> of the following categories: F (correction) A (mirror corresponding to a change in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6) Rel-7 (Release 7) Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)
Reason for change: # Introduce Band 29 (DL700) as a down-link only band in a part of the frequency range 716-728 MHz for E-UTRA operation and include CA_2-29, CA_4-29 to the specifications.		
Summary of change: # The DL700 band is introduced as a down-link only band in a part of the frequency range 716-728 MHz, specifically 717-728 MHz, due to BS-BS co-existence with Band 12. The band is defined for carrier-aggregation operation only and is restricted to carry SCell(s) without configured uplinks. The duplex mode is still defined as FDD but with the downlink paired with the (external) uplink band supporting the Pcell. Minimum requirements for Band 29 are only specified for the UE receiver configured with carrier aggregation (CA_2-29, CA_4-29). Spurious emissions requirements for protection of Band 29 are also specified.		
Consequences if not approved: # The range 716-728 MHz cannot be used for E-UTRA operation and the inter-band CA between Band 2 and DL700 as well as Band 4 and DL700 is not specified		
Clauses affected: # 5.5, 5.5A, 5.6A.1, 5.7.3, 6.6.3.2, 7.3.1A, 7.5.1A, 7.6.3.1A, 7.7.1A, 7.8.1A		
Other specs affected: (show related CRs)		# TS 36.307, TS 36.133 TS 36.521-1
Other comments: #		

Ex. 1030 at p. 1 (Green highlighting added. Yellow highlighting in original.)

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39. The table below is from TS 36.101 v11.3.0 that includes Band 29 as specified in the above CR. The highlighting for Operating Band 12 below shows the uplink (UL) operating band to be 699 MHz – 716 MHz. If an UL operating band was allocated for Band 29, it would overlap or be too close to Band 12 and would cause interference as described by the above CR with “due to BS-BS coexistence with Band 12 and, again, was not to provide a special downlink only CA configuration as the Patent Owner and its expert contends.

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Table 5.5-1 E-UTRA operating bands

E-UTRA Operating Band	Uplink (UL) operating band BS receive UE transmit		Downlink (DL) operating band BS transmit UE receive		Duplex Mode
	F _{UL, low}	F _{UL, high}	F _{DL, low}	F _{DL, high}	
1	1920 MHz	1980 MHz	2110 MHz	2170 MHz	FDD
2	1850 MHz	1910 MHz	1930 MHz	1990 MHz	FDD
3	1710 MHz	1785 MHz	1805 MHz	1880 MHz	FDD
4	1710 MHz	1755 MHz	2110 MHz	2155 MHz	FDD
5	824 MHz	849 MHz	869 MHz	894 MHz	FDD
6 ¹	830 MHz	840 MHz	875 MHz	885 MHz	FDD
7	2500 MHz	2570 MHz	2620 MHz	2690 MHz	FDD
8	880 MHz	915 MHz	925 MHz	960 MHz	FDD
9	1749.9 MHz	1784.9 MHz	1844.9 MHz	1879.9 MHz	FDD
10	1710 MHz	1770 MHz	2110 MHz	2170 MHz	FDD
11	1427.9 MHz	1447.9 MHz	1475.9 MHz	1495.9 MHz	FDD
12	699 MHz	716 MHz	729 MHz	746 MHz	FDD
13	777 MHz	787 MHz	746 MHz	756 MHz	FDD
14	788 MHz	798 MHz	758 MHz	768 MHz	FDD
15	Reserved		Reserved		FDD
16	Reserved		Reserved		FDD
17	704 MHz	716 MHz	734 MHz	746 MHz	FDD
18	815 MHz	830 MHz	860 MHz	875 MHz	FDD
19	830 MHz	845 MHz	875 MHz	890 MHz	FDD
20	832 MHz	862 MHz	791 MHz	821 MHz	FDD
21	1447.9 MHz	1462.9 MHz	1495.9 MHz	1510.9 MHz	FDD
22	3410 MHz	3490 MHz	3510 MHz	3590 MHz	FDD
23	2000 MHz	2020 MHz	2180 MHz	2200 MHz	FDD
24	1626.5 MHz	1660.5 MHz	1525 MHz	1559 MHz	FDD
25	1850 MHz	1915 MHz	1930 MHz	1995 MHz	FDD
26	814 MHz	849 MHz	859 MHz	894 MHz	FDD
27	807 MHz	824 MHz	852 MHz	869 MHz	FDD
28	703 MHz	748 MHz	758 MHz	803 MHz	FDD
29		N/A	717 MHz	728 MHz	FDD ²
...					
33	1900 MHz	1920 MHz	1900 MHz	1920 MHz	TDD
34	2010 MHz	2025 MHz	2010 MHz	2025 MHz	TDD
35	1850 MHz	1910 MHz	1850 MHz	1910 MHz	TDD
36	1930 MHz	1990 MHz	1930 MHz	1990 MHz	TDD
37	1910 MHz	1930 MHz	1910 MHz	1930 MHz	TDD
38	2570 MHz	2620 MHz	2570 MHz	2620 MHz	TDD
39	1880 MHz	1920 MHz	1880 MHz	1920 MHz	TDD
40	2300 MHz	2400 MHz	2300 MHz	2400 MHz	TDD
41	2496 MHz	2690 MHz	2496 MHz	2690 MHz	TDD
42	3400 MHz	3600 MHz	3400 MHz	3600 MHz	TDD
43	3600 MHz	3800 MHz	3600 MHz	3800 MHz	TDD
44	703 MHz	803 MHz	703 MHz	803 MHz	TDD

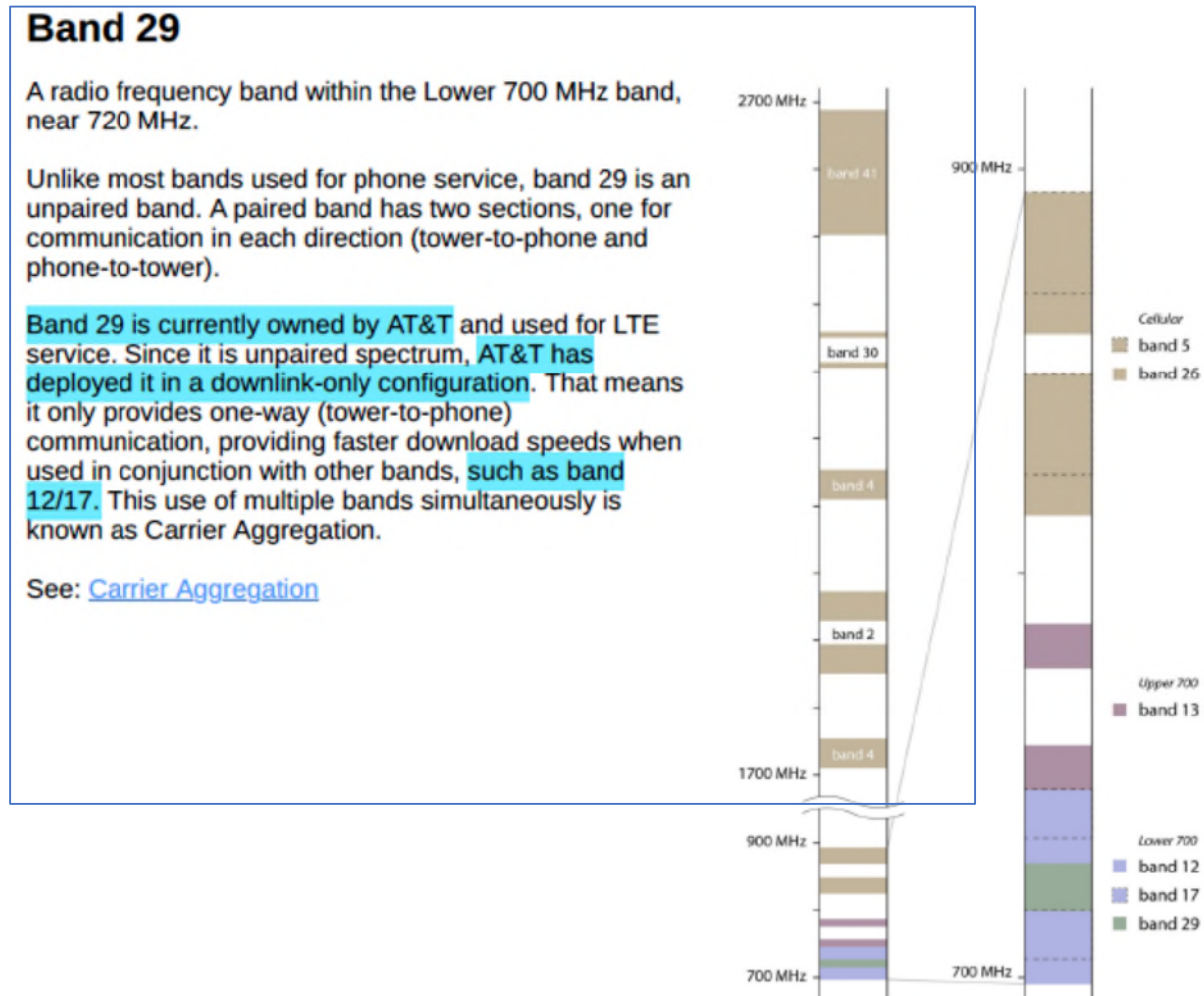
NOTE 1: Band 6 is not applicable
NOTE 2: Restricted to E-UTRA operation when carrier aggregation is configured. The downlink operating band is paired with the uplink operating band (external) of the carrier aggregation configuration that is supporting the configured Pcell.

Ex. 2009 p. 21 (highlighting added).

40. The following industry publication additionally supports that Band 29 is owned only by AT&T and it is “downlink-only configuration” and provides “faster download speeds when used in conjunction with other bands, such as band 12/17.”

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Therefore, this document describes using the paired Band 12 for the uplink and downlink, which has a frequency range that would have been interfered with if Band 29 was allocated an uplink frequency range.



Ex. 1034 at p. 1. (Blue highlighting added).

41. Therefore, Band 29 does have a frequency pair that can be used with it for CA—the listed DL frequency for Band 29 with either the listed UL frequency and the downlink frequency for Band 12 or Band 17.

F. Using the '976 Patent's Third Embodiment is Irrelevant and Misleading.

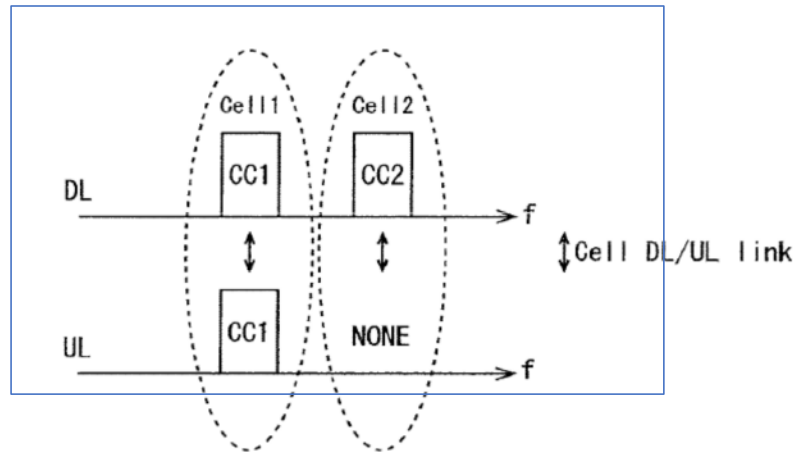
42. Second, the PO's use of the '976 Patent's Third Embodiment for a comparison of operating bands in Table 5.5-1 is offering another irrelevant and misleading argument for the board.

43. The Patent Owner directs the Board to consider the "third embodiment" of the '976 Patent in order to provide support for its erroneous statements regarding the allocation of CA frequency bands. The third embodiment is shown in Fig. 41 and described in its associated text, and PO's reference to it is another "red herring" argument because the Third embodiment is not relevant for Claim 2.

44. Claim 2 requires, *inter alia*, an *associated cell* configured to include a *resource for uplink and a resource for downlink* and a *non-associated cell* configured to include *only another resource for downlink* (no uplink resource). In other words, the *associated cell* has a *downlink* and an *uplink resource*, and the *non-associated cell* has just a *downlink resource* for communicating with the *base station*.

45. These requirements are shown by Fig. 28 of the '976 Patent along with its description text included below the figure. Cell1 in the figure is also referred to as the "PCell" or the *associated cell*. Cell2 is also referred to as the "SCell" or the *non-associated cell*. Thus, Cell1/*associated cell* has a "DL" and an "UL." Cell2/*non-*

associated cell only has a “DL” because the word “NONE” is listed for the uplink (UL).



Id. at Fig. 28.

It suffices that in this case, **a cell in which a UL CC is not configured is prohibited from serving as PCell and that the use thereof is limited to SCell.** Although the cell for which the UE performs RRC connection serves as PCell, in a cell in which a UL CC is not configured, the UE cannot perform uplink access for RRC connection. Therefore, if the cell in which a UL CC is not configured is prohibited from serving as PCell, the UE allows a cell in which a UL CC is configured to serve as PCell and is allowed CA. In addition, it is possible to prevent a UE from unnecessarily performing the RRC connection process in a cell in which a UL CC is not configured.

* * *

FIG. 28 is a diagram for describing cells for use in CA in the first embodiment of the present invention. A cell1 is configured by a DL CC1 and a UL CC1. The carrier frequency of the UL CC1 to be

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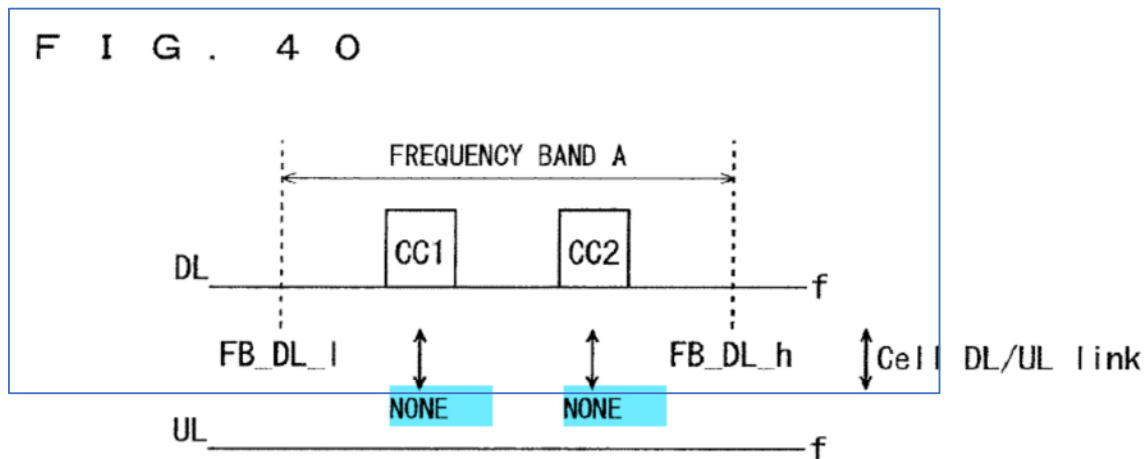
associated with the DL CC1 is shown in the DL/UL link (link) information of the cell. **A cell2 is configured by only a DL CC2, whereas a UL CC is not configured.** Therefore, it is indicated that a UL CC is not configured as the DL/UL link information of a cell. **The cell1 corresponds to an associated cell,** the DL CC1 corresponds to another resource for downlink, and the UL CC1 corresponds to a resource for uplink. **The cell2 corresponds to a non-associated cell,** and the DL CC2 corresponds to a resource for downlink.

Id. at 33:1-25 (emphasis added).

46. Thus, a POSITA would have understood that a “primary cell (PCell)” is synonymous with an *associated cell* and a secondary cell (SCell) is synonymous with a *non-associated cell* in Claim 2.

47. However, instead of citing to Fig. 28 (or a similar figure) to support its argument in its POR and MTA, the PO has erroneously cited to passages from the “Third Embodiment.” The Third Embodiment is not relevant to Claim 2 (or substitute claim 3) because it does not have any uplinks—it only discloses two downlinks, which does not meet the limitation of the *associated cell* having a *downlink resource* and an *uplink resource*.

48. Fig. 40 and its associated text included below is used to describe the Third Embodiment. It clearly shows that no uplinks exist with the “NONE” under both CC1 and CC2 along the horizontal “UL” line.



Ex. 1001, Fig 40 (highlighting added).

49. The Third Embodiment and Fig. 40 is described by the '976 Patent below that the Patent Owner has cited a portion of as its support, *See e.g.*, MTA p. 5 at III.A.

In the present embodiment, a frequency band configured by one or more resources for DL **without a resource for UL to be associated therewith.**

FIG. 40 is a diagram showing the concept of the frequency band configured by one or more resources for DL **without a resource for UL to be associated therewith.** The DL CC1 and DL CC2 are configured in the frequency band for downlink A as resources for DL.

* * *

There is no configuration of a UL CC being a resource for UL to be associated with the DL CC1. That is, there is no UL CC configured by the DL/UL link of the cell of the DL CC1. Similarly, there is no configuration of the UL CC being a resource for UL to be

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associated with the DL CC2. That is, there is no UL CC configured by the DL/UL link of the cell of the DL CC2.

Id. 49:14-30.

50. The above text clearly states that the Third Embodiment does not have any uplinks and, therefore, it is not relevant to Claim 2, and/or the Amended Claim.

51. The Patent Owner also erroneously uses Fig. 41 and its descriptive text from the '976 Patent as additional support for Claim 2 and the Amended Claim stating the “Innovation of the '976 Patent to Enable Base Station to Configure Cell with DL Resources Only.” (MTA pp. 7-9) and “[j]ust like operating band 29 in TS 36.101 V11.3.0, the operating band in Fig. 41 of the '976 Patent has no uplink resources assigned.” POR p. 26. Like for Fig. 40 above, this support using Fig. 41 from the Third Embodiment is also a red herring argument because Fig. 41 shows a configuration with NO uplinks. Fig. 41 and its description text are included below.

F I G . 4 1			
Band	Uplink (UL) operating Band		Duplex Mode
	F _{UL_low} — F _{UL_high}	F _{DL_low} — F _{DL_high}	
A	—	F _{B_DL_l} — F _{B_DL_h}	FDD

Ex. 1001, Fig. 41 (highlighting added).

FIG. 41 is a diagram showing a setting example of a frequency band configured by one or more resources for DL **without a resource for**

**UL to be associated therewith. There is no frequency band for
uplink (UL operating band) as the frequency band (band) A.**

Ex. 1001, 49:46-50 (highlighting added).

52. Like Fig. 40, Fig. 41 is also for the Third Embodiment and also clearly states that no uplinks are being allocated and it is also irrelevant for Claim 2 or the Substitute claim 3.

53. Therefore, all arguments including Fig. 40, Fig. 41 and their associated text should be rejected as irrelevant to Claim 2 and the Amended Claim.

G. TS 36.101 Does Disclose a Base Station Allocating Only a Downlink Resource on the Non-associated Cell Contrary to the PO Arguments.

54. As one of its validity arguments, the PO states the following:

Given the absence of any disclosed example in the 3GPP standard of an operating band having downlink resources only and thus unpaired from uplink resources until December 2012, well after the '976 Patent priority date, a POSITA would have concluded that the 3GPP standard including TS 36.300 V10.0.0 did not disclose or suggest a “non-associated cell” as recited in claim 2 that is configured by a base station to have downlink resources only. Moreover, this absence, in context with Petitioner’s relied upon disclosure from TS 36.300 V10.0.0 (EX1012), makes clear that no secondary serving cell (SCell) would have been configured by a base station to have downlink resources only. EX2005, ¶63. POR pp. 38-29.

55. I disagree. The PO is again using a predetermined list of Operating Bands listed in the LTE standard for its support. As discussed above, this is a “red

herring” argument because Claim 2 and the Amended Claim do not require a predetermined list. Instead, they require what resources are actually allocated by the base station.

H. R2-104515 Does Disclose the Base Station Allocating a Downlink Only Resource on the Non-associated cell Contrary to PO’s arguments.

56. The PO states that:

R2-104515 does not disclose or suggest that the base station configures the secondary cell to have downlink resources only (i.e., the “non-associated cell” of claim 2). In fact, R2-104515 makes clear that the base station configures the secondary cell to have both uplink and downlink resources while communicating to the UE whether to be configured to include or ignore the uplink resources available in the secondary cell. Accordingly, like TS 36.300 V10.0.0, R2-104515 fails to disclose or suggest a “non-associated cell” configured by the base station to have only a downlink resource allocated. EX2005, ¶65. POR p. 30.

The PO continues with the following:

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**(a) R2-104515's recommended option makes clear the
base station configures the secondary cell with both
uplink and downlink resources**

Despite suggesting three possible options to notify a UE to be configured without UL resources in a secondary cell, R2-104515 identifies significant drawbacks to Opt 1 and Opt 2 and thus recommends Opt 3. See EX1013, Observation 1 at 3, Observation 2 at 4, and Proposal at 5. Opt 3 proposes to define a new information element (IE) it labels as ul-PresenceIndicator. *Id.*, 4-5. R2-104515 defines ul-PresenceIndicator as follows:

<i>ul-PresenceIndicator</i> Indicates whether or not the UL resources are configured. When this parameter is set to 'false', the UE ignores any UL resource configurations of the secondary cell.

Id., 5. According to this definition, when ul-PresenceIndicator is set to false, “the UE ***ignores*** any UL resource configurations of the secondary cell” so that the UE is not configured with UL resources. Quite clearly, a POSITA would have understood that for the UE to be able to “ignore” any UL resource configurations of the secondary cell, such UL resource configurations necessarily exist for the secondary cell. EX2005, ¶66.

POR p. 31

57. I disagree for the following reasons and the reasons in my initial declaration.

58. First, the PO chooses to ignore and/or misinterpret the reason stated for this contribution of “[m]eanwhile, ***it is permitted that only DL resources are configured to secondary cells [non-associated cells]***]. Then, there comes a question

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on ***how to indicate UL absence of secondary cells***. This contribution mainly focuses on the detailed schemes of ***UL absence indication for secondary cells***. Ex. 1013 p. 1, 1 Introduction (emphasis added). This statement is clearly referring to the *resources that are configured by the base station*. More specifically, it is saying that only downlink resources can be configured for secondary cells.

59. Second, based on its stated premise that the base station can configure “only DL resources” to “secondary cells,” this document “focuses on the detailed schemes of UL absence indication for secondary cells.” *Id.*

60. Third, Section 2.2 titled “Options for indicating UL Absence/Deletion/Addition” for “Opt 1” clearly states that one of the configurations is “UL absence,” which it defines as “the ***UL resource configurations are all absent when initially configuring a secondary cell***.” *Id.* p. 2 (emphasis added).

Additionally, “Opt 2” states “[t]he IEs which are only necessary to primary cells and unrelated to secondary cells are all capable to be re-used as the ***UL absence indicator for secondary cells***.” *Id.* (emphasis added). Furthermore, “Opt 3” states “it is feasible to define a new IE¹ ***to indicate UL absence/deletion/addition***.” Therefore, all three listed options include that fact that a secondary cell (*non-associated cell*) can be configured by the base station with *only downlink resources*.

¹ IE stands for Information Element, which is the name for each field.

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61. PO focuses on TS 36.101 (Ex.2006) as “the specification for User Equipment (UE) radio transmission and reception” and “establishes the minimum RF characteristics and minimum performance requirements for E-UTRA User Equipment (UE).” Response, 16.) TS 36.300 10.0.0, provides “an overview and overall description of the E-UTRAN radio interface protocol architecture....” *Id.* at 16. TS 36.300 10.0.0 relates to the functionality of the (base station) and TS 36.101 relates to the UE, which for CA is configured by the base station to have specific resources. After considering the statements made by the PO and its expert, I still believe that a POSITA would have clearly understood that a secondary cell could be configured with only downlink resources (no uplink resources), which meets the required claim 2 limitation.

IX. REPLY FOR GROUNDS 2 AND 3: CLAIM 2 IS INVALID OVER MALLADI ALONE AND INVALID OVER MALLADI MODIFIED IN VIEW OF TS 25.319

62. Malladi is used for both Ground 2 and Ground 3. I understand the Patent Owner (PO) has not contested that Malladi discloses the limitations that I have listed as 2[pre] and 2[1]. Institution Decision, 17-18.

63. For Malladi’s disclosure of limitation 2[3], the PO has stated:

“Petitioner has not shown Malladi to disclose a non-associated cell having no uplink carriers.” ID, 21. Ground 2 of the Petition therefore fails to demonstrate a reasonable likelihood that Malladi would have anticipated the “non-

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associated cell” of claim 2. Claim 2 therefore remains patentable over Malladi in Ground 2.

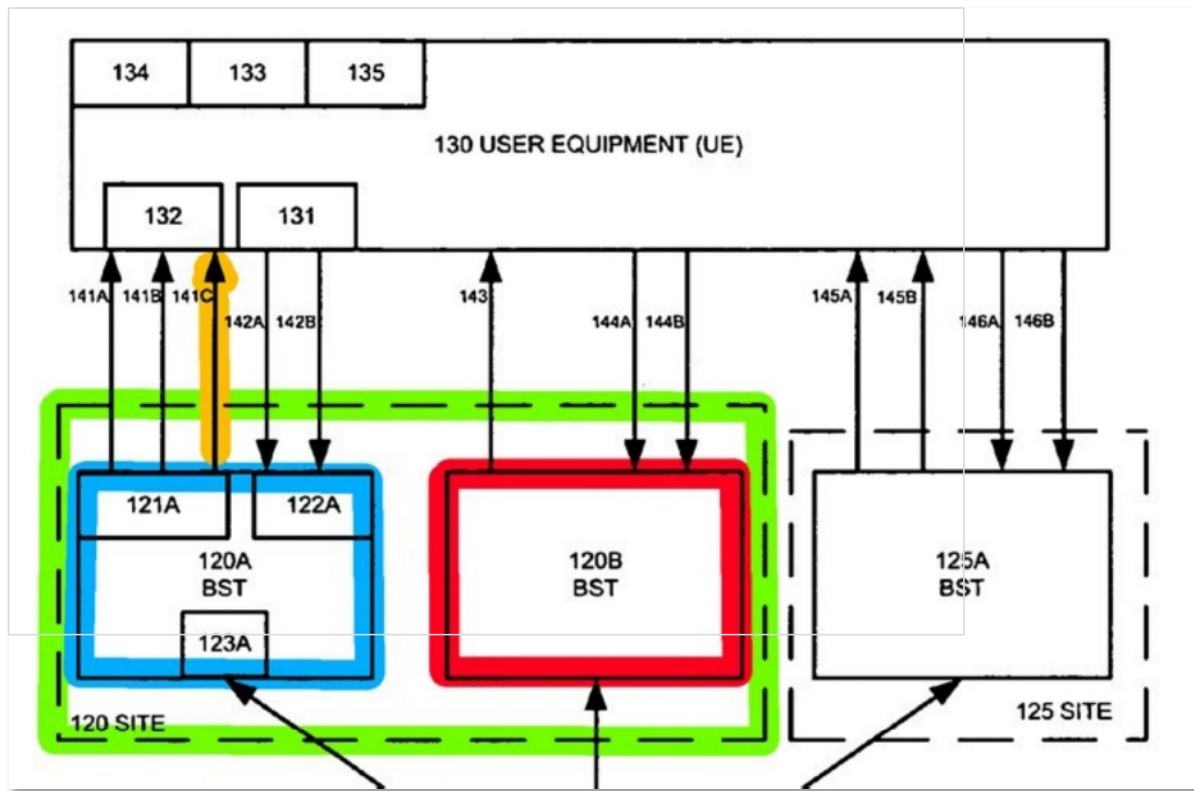
Response, 43.

I disagree for the reasons stated in my initial declaration and below.

A. Malladi Discloses Claim Limitation 2[3]

64. Limitation 2[3] states “*to include only another resource for downlink, the other resource for downlink being allocated to the downlink communication from the base station device.*” In other words, the base station does not configure an uplink resource on the non-associated cell.

65. I have annotated the different elements of claim 2 as disclosed by Malladi Fig. 1 and its descriptive text.



Ex. 1023 Top Part of Fig. 1 only (highlighting added).

66. Description of colored boxes. Cites for the following descriptions are in my initial declaration at paragraphs 159 – 160. The Orange highlighting for the 141C downlink carrier that does not have an uplink allocated for the pair is described in more detail below.

- Green (120 SITE) is for the base station;
- Blue (120A) is for a first cell of the base station;
- Red (120B) is for the second cell of the base station;
- Orange (141C) is for the downlink carrier frequency that does not have an uplink of the frequency pair allocated.

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- a. Malladi Provides Ranges for the Possible Number of Downlink and Uplink Carriers and Their Configuration Rules for a Cell and not a base station.

67. I understand that there is a dispute regarding the entity Malladi is referring to for the N and M values; is it at the base station level (120 Site or 125 Site) or is it the cell level (120A, 120B and 125A). As described below, Malladi is clearly referring to the number of the N and M carriers on the cell level i.e., the blocks labelled 120A, 120B and 125A and NOT a base station (120 Site or 125 Site) level. In all of the passages included below, Malladi is referring to one of the cells when describing the number of M and N carriers.

68. Additionally, Malladi teaches that the number of uplink carriers (M) and the number of downlink carriers (N) can vary on a cell-by-cell basis; they can be the same number ($N=M$), more downlink carriers than uplink carriers ($N>M$) or more uplink carriers than downlink carriers ($N<M$) with the following.

[0090]

When the ***number of uplink carriers equals the number of downlink carriers ($N=M$)***, each of the downlink carriers has an associated (paired) uplink carrier, and vice-versa. PHY procedures for this case (e.g., power control, synchronization, HS-DSCH, E-DCH, and related procedures) need not differ from the corresponding procedures in the single carrier case. ***In the cell 125A of FIG. 1***, for example, each downlink channel that supports an uplink carrier can be transmitted on the downlink carrier paired with the particular uplink carrier. Thus, the

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downlink carrier 145A can support the uplink carrier 146A, while the downlink carrier 145B can support the uplink carrier 146B. Therefore, in this case there may be no need to allocate on the downlink carrier support channels in addition to those already defined for the single-carrier case.

[0091]

Similarly, ***when the number of downlink carriers exceeds the number of uplink carriers ($N > M$)***, each of the uplink carriers has an associated (paired) downlink carrier. The paired downlink carriers will serve as conduits for the supporting (F-)DPCH, E-HICH/E-RGCH and E-AGCH (in case of M AGCH channels being used), with (N-M) downlink unpaired carriers carrying HS-PDSCHs and associated HS-SCCHs. ***In the cell 120A of FIG. 1***, for example, downlink support channels for a particular uplink channel can be present on the downlink carrier paired with the particular uplink channel. Thus, the downlink carrier 141A can support the uplink carrier 142A, while the downlink carrier 141B can support the uplink carrier 142B. ***In this asymmetric case*** there also may be no need to allocate on the downlink carrier support channels in addition to those already defined for the single-carrier case.

[0092]

Note that in the $N > M$ case, the timing of the downlink channels HS-PDSCH and HS-SCCH in the (N-M) unpaired downlink carriers is well defined, because, for the downlink, the timing of all the PHY changes is referenced to the nominal timing of the P-CCPCH or SCH of the anchor carrier. Thus, the timing of the channels in the (N-M) case is

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defined when the imposed timing constraint discussed above (common timing for the downlink carriers) is observed.

[0093]

When the number of downlink carriers is smaller than the number of uplink carriers ($N < M$), there are $(M - N)$ unpaired uplink carriers. Therefore, $(M - N)$ additional (F-)DPCHs may need to be allocated within the N downlink carriers; if absolute grants are transmitted on a per-carrier basis, then $(M - N)$ additional E-AGCHs may also need to be allocated in the N downlink carriers. Moreover, $(N < M) \times 2$ additional signatures may be needed for E-HICHs and E-RGCHs on the unpaired uplink carriers. ***In the cell 120B of FIG. 1,*** for example, one of the uplink carriers, e.g., 144B, is unpaired. It follows ***that in this asymmetric case*** the support channels for the uplink carrier 144B cannot be allocated on the corresponding paired downlink carrier in the usual manner, and need be allocated on one or more of the existing downlink carriers. For example, the support channels for the uplink carrier 144B may be allocated on the downlink carrier 143 (which is paired with the uplink carrier 144A).

Malladi [0090 – 0093] (emphasis added).

69. One embodiment of the many possible embodiments for Malladi's Asymmetric Multi-Carrier System is depicted in Fig. 1 above. Malladi also teaches that this configuration can be changed using a different number of downlink and/or uplink carriers for each cell.

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70. Specifically, Malladi Fig. 1 above is showing three down link carriers (141A-141C) and two uplink carriers (142A-142B) are configured by the base station labelled “120 Site” for cell 120A and the base station “120 Site” configured one downlink carrier (143) and two uplink carriers (144A-144B) for cell 120B. Thus, cell 120A has an asymmetric configuration of 3 downlink and 2 uplink carriers. Cell 120B has an asymmetric configuration of 1 downlink and 2 uplink carriers. However, the configuration for the whole base station, 120 Site, is not asymmetric because the total number of downlink carriers is the same as the total number of uplink carriers, which is four.

71. Therefore, a POSITA would understand, that for the configuration rules stated below, Malladi is referring to the number of uplink and downlink carriers the base station configures for each cell.

72. As I state in my initial declaration, the last sentence in the paragraph below is also key for the Challenged Claim 3 because it is stating that the number of uplink carriers defined as “M” can be equal to one. Thus, for an asymmetric multi-carrier system, as required by the Challenged Claim 2, the number of downlink carriers for a cell defined as “N” is greater than the number of uplink carriers defined as “M,” which is the condition of “ $N > M$ ” described below. Using basic mathematics and following the rules listed below, if N (DL carriers) is a value of 2, then M (uplink carriers) can be a value of 1.

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Importantly, **the number of forward link carriers may differ from the number of reverse link carriers in a multi-carrier system. For example, the number of downlink carriers (N) may exceed the number of uplink carriers (M), i.e., $N > M$. The opposite relationship is also possible, albeit less likely, with the number of uplink carriers exceeding the number of downlink carriers, i.e., $M > N$. Of course, the numbers of the uplink and downlink carriers may be the same in a multi-carrier system, i.e., $N = M$. As noted in the immediately preceding paragraph, either N or M may equal 1 in a multi-carrier system.**

Id. at [0008] (emphasis added).

73. Referring to Fig. 1 above, Malladi teaches the base station “120 SITE” could configure the cell 120A with one downlink carrier, say 141A and one uplink carrier that is a paired frequency with 141A, which is 142A. *Id.* [0091] (“Thus, the downlink carrier 141A can support the uplink carrier 142A.”). Additionally, Malladi teaches that cell 120B can be configured with only one downlink carrier ($N=1$) and no uplink carriers ($M=0$). Malladi teaches for this configuration; an uplink carrier frequency would not be assigned so no frequency pair is supported. *Id.* [0092] (“Note that in the $N > M$ case, the timing of the downlink channels HS-PDSCH and HS-SCCH in the $(N-M)$ unpaired downlink carriers is well defined”).

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74. I also note that the role of cells 120A and 120B in this example could be switched by the base station so that 120B is the *associated cell* and 120A in the *non-associated cell*.

75. Thus, a POSITA would have understood that Malladi provides a range of values for the number of downlink carrier resources (N) and the number of uplink carrier resources (M) in addition to the defining the different relationships that can occur between M and N and how the base station accommodates a cell configuration that does not have an uplink carrier paired to a downlink carrier. Thus, a cell can be configured by the base station to have N=1 downlink carriers and M=0 uplink carriers. For limitation 2[3], this cell would be the *non-associated cell*.

b. Malladi Discloses Using Paired Frequencies When the Number of Uplink Carriers is Equal to the Number of Downlink Carriers and Non-Paired Frequency When the Number of Uplink Carriers is Less Than the Number of Downlink Carriers

76. Malladi describes “multi-carrier communication systems” are based on two or more carrier frequencies with at least the following passage:

Multi-carrier communication systems are being developed to satisfy the constantly increasing demand for wireless services, and in particular for data services. **A multi-carrier communication system is a system with the capability to transmit information on two or more carrier frequencies.** It should be noted that multi-carrier system capability **may exist in both downlink and uplink connections; alternatively,**

**a multi-carrier system may have multi-carrier capability only on
uplink or only on downlink.**

Id. at [0007] (emphasis added).

77. Malladi also discloses using paired frequency bands when the number of downlink carriers and uplink carriers configured for a cell are equal. Malladi also discloses allocating a downlink carrier frequency that is not paired with an uplink carrier frequency when the number of downlinks is greater than the number of uplinks with at least the following passages.

[0090]

When the number of uplink carriers equals the number of downlink carriers ($N=M$), each of the downlink carriers has an associated (paired) uplink carrier, and vice-versa. PHY procedures for this case (e.g., power control, synchronization, HS-DSCH, E-DCH, and related procedures) need not differ from the corresponding procedures in the single carrier case. In the cell 125A of FIG. 1, for example, ***each downlink channel that supports an uplink carrier can be transmitted on the downlink carrier paired with the particular uplink carrier. Thus, the downlink carrier 145A can support the uplink carrier 146A, while the downlink carrier 145B can support the uplink carrier 146B.*** Therefore, in this case there may be no need to allocate on the downlink carrier support channels in addition to those already defined for the single-carrier case.

[0091]

Similarly, *when the number of downlink carriers exceeds the number of uplink carriers ($N > M$), each of the uplink carriers has an associated (paired) downlink carrier.* The paired downlink carriers will serve as conduits for the supporting (F-)DPCH, E-HICH/E-RGCH and E-AGCH (in case of M AGCH channels being used), with (N-M) downlink unpaired carriers carrying HS-PDSCHs and associated HS-SCCHs. *In the cell 120A of FIG. 1*, for example, downlink support channels for a particular uplink channel can be present on the downlink carrier paired with the particular uplink channel. Thus, the downlink carrier 141A can support the uplink carrier 142A, while the downlink carrier 141B can support the uplink carrier 142B. *In this asymmetric case there also may be no need to allocate on the downlinks carrier support channels in addition to those already defined for the single-carrier case.*

[0092]

Note that in the $N > M$ case, the timing of the downlink channels HS-PDSCH and HS-SCCH in the (N-M) *unpaired downlink carriers is well defined*, because, for the downlink, the timing of all the PHY changes is referenced to the nominal timing of the P-CCPCH or SCH of the anchor carrier. Thus, the timing of the channels in the (N-M) case is defined when the imposed timing constraint discussed above (common timing for the downlink carriers) is observed.

Malladi [0090 – 0092] (emphasis added).

78. Therefore, Malladi also discloses the additional limitations of the Amended Claim.

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B. Motivation to Combine Malladi with TS 25.319

79. I understand that the Board accepted the stated motivation to combine Malladi with TS 25.319 by Petitioner, but the PO has further challenged the stated motivation to combine these two references. *See* POR at pp. 47-50 (“Petitioner does not explain why TS 25.319’s alleged teaching of a cell with only downlink resources is a requirement of the 3G UMTS network.”) I disagree. The following paragraphs are in reply to these statements by the PO.

80. First, as I explain in my initial declaration, the 3GPP TS 25.319 V9.1.0 Specification was published for Release 9 of the 3G UMTS network. Specifically, TS 25.319 defines the requirements for the “Enhanced Uplink” functionality. The “Enhanced Uplink” is also referred to as the High Speed Uplink Packet Access (HSUPA). The initial HSUPA functionality was defined in 3GPP Release 6 for the UMTS network so Release 9 was released to address the new network functionality introduced in Release 9 that the HSUPA needed to support. As I also describe in my initial declaration, one of these new functions was the functionality for “Dual Cell” operation to support Carrier Aggregation (CA) on the HSUPA (uplink) channels.

81. As I also describe in my initial declaration, one of the configurations that the HSUPA functionality needed to support was having either one or zero secondary uplink carriers. *See* Initial declaration at pp. 49-51. In other words, TS 25.319 was to inform suppliers of base stations and UEs that, if the Carrier

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Aggregation functionality is supported, they needed to support either one or zero HSUPA data channels on the secondary cell (SCell) referred to as a E-DCH (Enhanced-Data CHannel) on a secondary uplink carrier.

82. Malladi, like TS 25.319 states that one of the systems its invention supports is the “W-CDMA standard.” As I explain in my initial declaration, the W-CDMA standard is also known as the 3G UMTS standard. Malladi also lists multiple 3GPP Specification numbers that are specifically for UMTS. Also, like part of TS 25.319, Malladi’s invention is for “adding multi-carrier capability to single-carrier communication systems.” I as describe in my initial declaration; this is also referred to as carrier aggregation. As discussed in the section above, Malladi discloses a base station configuring a cell with no uplink carriers. Malladi, like TS 25.319 also describes using the HSUPA (E-DCH) for carrying uplink data in its invention. *See e.g.*, [0079] (“multi-carrier transmissions may be limited to the Enhanced Dedicated Channel or "E-DCH"), and [0094] (“are related to E-DCH transmissions on the uplink.”).

83. Therefore, a POSITA would have looked to Malladi for UE implementation details when implementing the new Carrier Aggregation functionality required in TS 25.319 for Release 9 of the UMTS network. In addition to defining possible configurations for the uplink and downlink carriers, Malladi also provides valuable information regarding the timing signals and secondary channels

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and methods that can be when the number of uplink carriers and downlink carriers is asymmetric (different), which is a significant departure from the UMTS Release 8 functionality. For example, in paragraphs [0072 – 0107] Malladi provides useful tables and different combinations of timing and secondary signals for each M and N configuration.

C. TS 25.319 Discloses Limitation 2[3]

84. I understand the Patent Owner (PO) has only contested limitation 2[3] for TS 25.319. POR, 44-47.

85. Regarding the disclosure of limitation 2[3] by TS 25.319, the PO has stated:

Not only does TS 25.319 have no teachings of a cell having downlink resources only or that a base station configures a cell with downlink resources only, but Petitioner's evidence to support that TS 25.319 allegedly teaches such a cell relies on a clear misinterpretation of that evidence. A proper evaluation of the evidence fails to support Petitioner's contention and in fact comes to the opposite conclusion, i.e., TS 25.319 has no disclosure or suggestion of a base station configuring a cell to have downlink resources only. EX2005, ¶77.

POR at 44.

86. Additionally, the PO argues that: "the "zero or one" refers to the number of Serving cells on the secondary uplink carrier, not, as Petitioner argues, the number

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of secondary uplink carriers on the secondary cell. *Id.* (citing Ex. 2001 59). PTAB ID at pp. 23-24.

87. I disagree for the reasons stated in my initial declaration and below.

88. I believe there is confusion over the terminology being used by the TS 25.319 Specification and how it applies to limitation 2[3] so the passages at issue are shown below, and after it, I have provided definitions and descriptions for the terms it uses.

Serving E-DCH cell: Cell from which the UE receives Absolute Grants from the Node-B scheduler. A UE has one Serving E-DCH cell.

[**Secondary E-DCH Active Set:** In Dual Cell E-DCH operation, the set of cells on the secondary downlink carrier where E-DCH is carried for one UE.

Secondary Serving E-DCH cell: In Dual Cell E-DCH operation, cell from which the UE receives Absolute Grants from the Node-B scheduler on the secondary downlink. A UE can have zero or one Serving E-DCH cell on the secondary uplink carrier.]

Ex. 1015 (TS 25.319) at p. 7, Section 3.1.1 (highlighting added)

a. An E-DCH

89. The E-DCH acronym is defined as “Enhanced DCH, a new dedicated and common (FDD and 1.28Mcps TDD only) transport channel type or enhancements to an existing dedicated and common (FDD and 1.28Mcps TDD only) transport channel type.” *Id.* p. 7. The DCH part of E-DCH stands for “Dedicated CHannel.” In other words, an E-DCH is an HSUPA channel that carries uplink user data.

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b. Node-B (base station) and Cells

90. For Carrier Aggregation, a base station (Node-B) has a cell that is used to support each Component Carrier (CC). A CC can consist of a downlink frequency and/or an uplink frequency, so each CC is described as either a downlink CC or an uplink CC. Thus, if there are two downlink and uplink CCs (or just carriers) configured by a base station, there would be two different cells (transceivers) supporting these. One cell would be configured to support the frequencies for the first downlink and uplink CC and a second cell would be configured. T

91. Only one of the cells in a CC group can be designated as the Primary Cell (PCell), which performs additional functionality. The other cells in each CC group are referred to as Secondary Cells (SCells). Initial Declaration at pp. 23-26.

c. Serving E-DCH Cell

92. The Serving E-DCH cell is defined as the “Cell from which the UE receives Absolute Grants from the Node-B scheduler. A UE has one Serving E-DCH cell.” *Id.* A POSITA would have understood, that for normal, non-carrier-aggregation operation, a base station (Node-B) would have only one cell and this cell provides the UE with “Absolute Grants” on a downlink control channel that it uses to send user data over the uplink E-DCH. These “Absolute Grants” are typically a response to a resource request made by the UE.

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d. Dual Cell E-DCH Operation

93. TS 25.308 uses “Dual Cell” operation and “Carrier Aggregation” terminology interchangeably. *See e.g.*, Initial Declaration at pp. 46-47 and Ex. 2021 at p. 99. Therefore, “Dual Cell E-DCH Operation” in this document (TS 25.319) that is for the HSUPA (high speed uplink) means Carrier Aggregation using the Enhanced Data CHannel for uplink.

e. Secondary Serving E-DCH Cell

94. Secondary Serving E-DCH Cell is defined as: “In Dual Cell E-DCH operation, cell from which the UE receives Absolute Grants from the Node-B scheduler on the secondary downlink. A UE can have zero or one Serving E-DCH cell on the secondary uplink carrier.]” Ex. 1015 (TS 25.319) at p. 7.

95. Taking this definition in parts, the phrase “cell from which the UE receives Absolute Grants from the Node-B scheduler on the secondary downlink” means, similar to the primary serving cell, this secondary cell provides the UE with “Absolute Grants” on the secondary downlink CC so the UE can send user data on the secondary E-DCH uplink, if it is configured. These “Absolute Grants” would be in response to a resource request made by the UE on the secondary uplink CC.

96. The phrase “A UE can have zero or one Serving E-DCH cell on the secondary uplink carrier.]” means that, for the “secondary uplink carrier,” a UE can

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have zero or one Serving E-DCH cell. In other words, for the secondary uplink carrier, a UE can have either one or none HSUPA uplinks.

97. Based on the above definitions, there is a one-to-one relationship between a Serving Cell and a Carrier (aka Component Carrier). Therefore, the Secondary Serving Cell can have a maximum of one downlink carrier and a maximum of 1 uplink carrier. For FDD operation, when both the downlink and uplink carriers are configured by the Secondary Serving Cell (one HSDPA downlink and one HSUPA uplink), they would be on a pair of frequencies for an operating band chosen by the base station. However, if the base station configures the Secondary Serving Cell with one downlink carrier and “zero” uplink carriers (one HSDPA downlink and no HSUPA uplinks), a pair of frequencies would not be configured because no frequency assignment would be required for the non-configured secondary HSUPA uplink.

98. This interpretation is consistent with the Carrier Aggregation functionality defined by the 3GPP Standards group for Release 9. Specifically, the ’976 patent supports this interpretation, that the “carrier” in the above cited passage means “component carrier” and the possible

Each CC employs the configuration of Release 8 or 9, and the CA supports contiguous CCs, non-contiguous CCs, and CCs in different frequency bandwidths. The UE cannot configure the

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number of uplink CCs (UL CCs) equal to or more than the number of downlink CCs (DL CCs). The CCs configured by the same eNBs do not need to provide the same [geographic] coverage. The CC is compatible with Release 8 or 9.

Ex. 1001 at 9:17-23 (emphasis added) and Initial Declaration pp. 28-29.

99. Therefore, contrary to the Patent Owner’s latest interpretation of this passage (included above), the ’976 patent specification clearly states, that for “the CCs [Component Carriers] configured by the same eNB [eNodeB or base station]” for 3GPP Release 9, which is the same release of TS 25.319 Specification being used, the base station **cannot configure** the UE with “a number uplink CCs (UL CCs) **equal to or more than the number of downlink CCs (DL CCs).**” Therefore, if the *base station* configures an *associated cell* with a DL CC and the *non-associated cell* with a DL CC, this would be a total of two DL CCs configured by the base station. Therefore, the total number of UL CCs for the base station must be only one because it **cannot be equal or more than the total number of downlink CCs.**

100. Therefore, TS 25.319 does disclose that the *non-associated cell* (Secondary Serving E-DCH cell) can be configured with only a *downlink resource*.

X. THE PATENT OWNER HAS NOT SHOWN THE ’976 PATENT SUPPORTS THE AMENDED CLAIM’S AMENDMENTS

101. I understand that the Petitioners are now challenging the amended claim 2 (the “Amended Claim” or “substitute claim 3” or “substitute for claim 2”) proposed

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by the Patent Owner. I have reviewed the MTA and disagree that the Amended Claim is valid for at least the following reasons.

102. The Amended Claim states:

3. (Contingent substitute for claim 2) A communication terminal device performing radio communication with a base station device, wherein

the communication terminal device performs uplink communication using an associated cell configured by the base station to include a resource for uplink and a resource for downlink, the resource for uplink being included in an uplink frequency band that is paired with a first downlink frequency band and being allocated to the uplink communication to the base station device, the resource for downlink being included in the first downlink frequency band and being allocated to the downlink communication from the base station device, and

the communication terminal device performs downlink communication using the associated cell and a non-associated cell configured by the base station to include only another resource for downlink, the other resource for downlink being included in a second downlink frequency band that is not paired with any uplink frequency band and being allocated to the downlink communication from the base station device.

MTA Appendix A p. 1.

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103. As described below, the Amended Claim is invalid because the PO has not shown that the '976 patent supports its amendments.

104. I understand from counsel that, for an amended claim, the '976 patent must disclose the proposed amendments in the same way must support the unamended claim. I understand it is improper to add new matter to a claim under 37 CFR § 42.121. However, the PO has made misleading erroneous statements and provided irrelevant information in its attempt to provide support for its amendments as described below.

A. The Third Embodiment in the '976 Patent Does Not Support The Amended Claim

105. The PO has used passages and figures for the “Third Embodiment” of the '976 Patent to support its opinions that the '976 Patent discloses using only downlink resources for the non-associated cell. *See* MTA pp. 5 and 7-8. Citing to the Third Embodiment is wrong and misleading as described below.

a. The Third Embodiment Does Not Include Any Uplink Resources

106. As described in Section VIII.F above, the Third Embodiment is for a configuration where no uplink resources are configured for the associated cell or the non-associated cell, which is a significantly different configuration than what is required for Claim 2 or the Amended Claim. Therefore, any citations to the text or figures of the Third Embodiment are not relevant and are misleading.

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107. Below are some passages which show the third embodiment does not support the new claim amendments. With respect to 48:58-67, this passage relates to the Third Embodiment related to a CC1/PCell and CC2/SCell, both of which have downlink resources, but no uplink resources allocated to them. Ex. 1001, 49:9-19, Fig. 40. With regard to 32:40-50, this passage states that not allocating a UL resource to the SCell/CC2, “eliminates the need to always reserve a resource for UL in the same frequency band as that of a resource for DL in a communication system. This enables to allocate a resource for UL that becomes unnecessary to another cell, another operator, another system, or the like. Therefore, it is possible to improve the use efficiency of frequency resources.” Ex. 1001, 32:44-50. As such, this passage does not disclose an embodiment where there is an unpaired UL resource; rather, it discusses not allocating the paired UL resource to the UE such that it can be used by a different UE or cell. Patent Owner also cites 50:1-5, 50:6-10, 50:11-17, and 50:17-19 of the '976 patent as alleged support for its proposed amendment. However, those passages relate to the Third Embodiment and Figures 40 and 41, and as shown below, relate to an embodiment where the PCell/CC1 and SCell/CC2 each have a resource allocated to them for DL but neither have a UL resource allocated.

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- b. The Statement of “Innovation of the ’976 Patent to Enable Base Station to Configure Cell with DL Resources Only” is Irrelevant and Misleading

108. As described in the section directly above, the PO’s use of the Third Embodiment of the ’976 Patent is irrelevant and misleading because the Third Embodiment is not for the configuration required by Claim 2 or the Amended Claim.

B. The ’976 Patent Does Not Support Using Paired or Unpaired Frequency Bands As Required by the Amended Claim

109. As an initial matter, any citations to the Third Embodiment by the PO in support of the Amended Claim are wrong and misleading because it does not support the uplink resource requirement of Claim 2 or the Amended Claim as described in Section VIII.F above. In other words, any description regarding a selection of a frequency band with only a downlink resource for this embodiment is not relevant because no uplink resources are being configured for the associated cell or the non-associated cell.

110. Patent Owner’s position is that the predetermined operating frequency bands shown in Table 5.5-1 of TS 36.101 are the downlink and uplink “resource” allocated by the base station. Motion at 7. That is incorrect. Table 5.5-1 is used only to inform the UE of the *possible* operating frequency bands that are supported by a specific cell; it is broadcast to every UE in the base station’s serving area. A frequency in the table is not allocated to a UE until the base station sends an RRC

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signaling message that specifies the frequency the UE should use for downlink and uplink. This is the only type of pairing supported by the '976 Patent, and the prior art applied in Ground 1 of the Petition also shows exactly this.

111. The PO has not provided any support outside of the irrelevant third embodiment for the '976 patent specifically disclosing the base station configuring a paired uplink and downlink frequency band for an associated cell or configuring a non-paired downlink frequency band for a non-associated cell. In the following paragraphs, I show how each of the frequency band disclosures by the ' 976 patent are not relevant for the Amended Claim.

112. The '976 patent describes separate downlink and uplink frequency bands as operating bands that are required to support for FDD voice communication as shown below. However, this passage is not in regard to the additional claim limitations of the Amended Claim.

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The frequency bands (hereinafter, referred to as “operating bands” in some cases) usable for communication have
35 been predetermined in the LTE. Non-Patent Document 8 describes the frequency bands. In the frequency division duplex (FDD) communication, a frequency band for downlink (hereinafter, referred to as “downlink frequency band” in some cases) and a frequency band for uplink (hereinafter,
40 referred to as “uplink frequency band” in some cases) that is paired with the downlink frequency band have been predetermined, where the uplink frequency band differs from the downlink frequency band. This is because the downlink and uplink are necessarily required for conventional communi-
45 cation such as voice communication so that transmission and reception are enabled at the same time by splitting the frequencies between downlink and uplink in the FDD.

Ex. 1001 8:33-47.

113. The '976 Patent clearly teaches that in FDD, pairing of uplink and downlink frequencies are mandatory. Ex. 1001, 8:36-47, 10:37-44, 22:39-54, 23:41-49, 24:9-12, 35:63-36:12. The '976 patent's discussion of a base station configuring a downlink frequency band where no paired uplink frequency band has been configured (Third Embodiment where there are two downlink frequency bands configured and no uplink frequency bands) does not teach otherwise. See Ex. 1001, 49:40-45 (“There is no resource for UL, which means that a frequency band for uplink corresponding to a frequency band for downlink is not required. This enables to configure a frequency band for downlink in which a frequency band for uplink to be paired therewith is not configured.”). That describes a situation in which the downlink frequency bands have been configured for the UE, but not the uplink

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frequency bands to the UE. It does not indicate that the base station does not have paired UL and DL frequency bands. In fact, this embodiment cannot reasonably be interpreted as Patent Owner suggests because Patent Owner, even with the citations to the later references, have not shown frequency bands with a DL not paired with an UL, even as PO reads the table 5.5-1. Ex. 2005, p. 33; Ex. 2009, 21-23.

114. The figures that Patent Owner cites as alleged support for channels in which the UL and the DL are not paired do not support Patent Owner. The '976 patent discusses frequency division duplex (FDD) and how in FDD there is always a frequency band for UL and a frequency band for DL that are paired, as set up by the base station. Ex. 1001, 8:18-26. This is shown in the exhibit that Dr. Cooklev (Patent Owner's expert) has cited to show that there allegedly is no pairing. *See* Ex. 2005, p. 33; Ex. 2009, 21-23. That exhibits includes the following table:

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Table 5.5-1 E-UTRA operating bands

E-UTRA Operating Band	Uplink (UL) operating band BS receive UE transmit	Downlink (DL) operating band BS transmit UE receive	Duplex Mode
	$F_{UL,low} - F_{UL,high}$	$F_{DL,low} - F_{DL,high}$	
1	1920 MHz – 1980 MHz	2110 MHz – 2170 MHz	FDD
2	1850 MHz – 1910 MHz	1930 MHz – 1990 MHz	FDD
3	1710 MHz – 1785 MHz	1805 MHz – 1880 MHz	FDD
4	1710 MHz – 1755 MHz	2110 MHz – 2155 MHz	FDD
5	824 MHz – 849 MHz	869 MHz – 894 MHz	FDD
6 ¹	830 MHz – 840 MHz	875 MHz – 885 MHz	FDD
7	2500 MHz – 2570 MHz	2620 MHz – 2690 MHz	FDD
8	880 MHz – 915 MHz	925 MHz – 960 MHz	FDD
9	1749.9 MHz – 1784.9 MHz	1844.9 MHz – 1879.9 MHz	FDD
10	1710 MHz – 1770 MHz	2110 MHz – 2170 MHz	FDD
11	1427.9 MHz – 1447.9 MHz	1475.9 MHz – 1495.9 MHz	FDD
12	699 MHz – 716 MHz	729 MHz – 746 MHz	FDD
13	777 MHz – 787 MHz	746 MHz – 756 MHz	FDD
14	788 MHz – 798 MHz	758 MHz – 768 MHz	FDD
15	Reserved	Reserved	FDD
16	Reserved	Reserved	FDD
17	704 MHz – 716 MHz	734 MHz – 746 MHz	FDD
18	815 MHz – 830 MHz	860 MHz – 875 MHz	FDD
19	830 MHz – 845 MHz	875 MHz – 890 MHz	FDD
20	832 MHz – 862 MHz	791 MHz – 821 MHz	FDD
21	1447.9 MHz – 1462.9 MHz	1495.9 MHz – 1510.9 MHz	FDD
22	3410 MHz – 3490 MHz	3510 MHz – 3590 MHz	FDD
23	2000 MHz – 2020 MHz	2180 MHz – 2200 MHz	FDD
24	1626.5 MHz – 1660.5 MHz	1525 MHz – 1559 MHz	FDD
25	1850 MHz – 1915 MHz	1930 MHz – 1995 MHz	FDD
26	814 MHz – 849 MHz	859 MHz – 894 MHz	FDD
27	807 MHz – 824 MHz	852 MHz – 869 MHz	FDD
28	703 MHz – 748 MHz	758 MHz – 803 MHz	FDD
29	N/A	717 MHz – 728 MHz	FDD ²
...			
33	1900 MHz – 1920 MHz	1900 MHz – 1920 MHz	TDD
34	2010 MHz – 2025 MHz	2010 MHz – 2025 MHz	TDD
35	1850 MHz – 1910 MHz	1850 MHz – 1910 MHz	TDD
36	1930 MHz – 1990 MHz	1930 MHz – 1990 MHz	TDD
37	1910 MHz – 1930 MHz	1910 MHz – 1930 MHz	TDD
38	2570 MHz – 2620 MHz	2570 MHz – 2620 MHz	TDD
39	1880 MHz – 1920 MHz	1880 MHz – 1920 MHz	TDD
40	2300 MHz – 2400 MHz	2300 MHz – 2400 MHz	TDD
41	2496 MHz – 2690 MHz	2496 MHz – 2690 MHz	TDD
42	3400 MHz – 3600 MHz	3400 MHz – 3600 MHz	TDD
43	3600 MHz – 3800 MHz	3600 MHz – 3800 MHz	TDD
44	703 MHz – 803 MHz	703 MHz – 803 MHz	TDD

NOTE 1: Band 6 is not applicable
NOTE 2: Restricted to E-UTRA operation when carrier aggregation is configured. The downlink operating band is paired with the uplink operating band (external) of the carrier aggregation configuration that is supporting the configured Pcell.

Ex. 2009, 21-23 (highlighting added).

115. Patent Owner and its expert fail to address Note 2, which states that operating band 29 is related to carrier aggregation and the downlink band is “paired with” the operating band (external) of the carrier aggregation configuration that is

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supporting the configured PCell. Ex. 2009, 21-23. Thus, the DL is paired with a UL in a different operating band, as set up by the base station. This pairing is required by FDD as discussed above. Therefore, this downlink channel is in fact paired contrary to Patent Owner's argument. As such, the sole evidence that Patent Owner relies on to allegedly show that a lack of pairing did not exist until after the filing date of the '976 patent instead shows that the downlink is indeed paired.

116. The '976 patent does not describe, as Patent Owner suggests, that a lack of "pairing" means that there is no UL frequency "paired" with the DL frequency by the base station. In fact, the opposite is true. The '976 patent describes the frequency bands in the charts as "associated with each other." Ex. 1001, 35:53-57. The '976 patent also describes using the parameter of "ul-CarrierFreq" of the SIB2 where the UL CC is located in a frequency band different from that of the DL CC. Ex. 1001, 35:58-62. The '976 patent also describes that in FDD, a frequency band of uplink that is paired with the frequency band of downlink is predetermined in FDD. Ex. 1001, 35:63-65. The patent then goes on to describe that the "ul-CarrierFreq" of the SIB2 discloses these predetermined pairings to the UE. Ex. 1001, 35:66-36:9.

117. In fact, the Second Embodiment describes a method of associating a DL CC with a UL CC in different frequency bands with each other and broadcasting that information to the UE. Ex. 1001, 36:14-20. Therefore, the Second Embodiment of the '976 patent does not have a DL frequency band that is not associated with an UL

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frequency band; rather, the Second Embodiment pairs a DL CC with an UL CC from different frequency bands. Ex. 1001, 26: 14-20.

118. The third embodiment, and figures 40 and 41 of the '976 patent do not show that there are unpaired downlink frequencies set up by the base station on a cell with no paired uplink frequencies configured by the base station as patent owner suggests. Although the UL resources are not allocated to the UE, that does not mean that they are not present in the base station. Ex. 1001, 49:55-57 ("This is effective in a case where the configuration of a frequency band is predetermined."). Thus, the '976 patent describes a predetermined UL and DL frequency band; however, the UL bands are not sent to the UE. Ex. 1001, 50:1-7 ("In a case of the frequency band for downlink disclosed in the present embodiment, the DL/UL link information of a cell may be reduced in a DL CC configured in that band. In addition, the DL/UL link information of the cell is not required to be broadcasted UEs being served by the cell. The frequency band for downlink is shown in the DL CC configured in the band, specifically, is included in the SIB1.")

119. A person of ordinary skill in the art would understand that the '976 patent describes a scenario where the base station has a DL CC and UL CC configured and paired, however, the UE receives only the DL information, thus reserving the UL resources for other UEs. Ex. 1001, 50:11-15 ("Therefore, even if not having received the DL/UL link information of a cell from that cell, a UE can

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recognize the configuration of a frequency band in which that cell is configured, and can recognize that a frequency band for uplink is not configured in that frequency band.”).

120. In sum, the ’976 patent describes a scenario where there are paired DL/UL frequency bands associated with a base station, and the base station is telling the UE that only DL is configured for the UE. Otherwise, there would not be DL/UL link information to send.

121. Accordingly, the ’976 patent does not provide sufficient support for the limitation “being included in a second downlink frequency band that is not paired with any uplink frequency band,” in proposed claim 3.

122. Patent Owner’s arguments regarding substitute claim 3 are unsound because Patent Owner’s contention that the prior art shows only “predetermined pairings of UL and DL frequency bands as of the priority date of the ’976 Patent” is incorrect.

123. The “pairings” disclosed in the 3GPP LTE specification are predetermined frequencies available for use by all UEs. This is confirmed by the ’976 patent which states that these “paired” frequencies are broadcast to all UEs through the SIB1. Ex. 1001, 8:57-65. They are not necessarily configured by the base station as resources for UL and DL for the communication terminal as required by claim 2 or substitute claim 3. These so-called “pairings” are merely available to

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all UE's, not what is necessarily allocated to a specific UE. Thus, the bands in the various tables cited by Patent Owner are only possible bands; however, not all base stations support all of the bands in the tables. These bands are not an allocation by the base station to the UE of UL and DL frequencies. The base station configures the UL and DL resources to the UE through the use of RRC signaling.

124. The '976 patent also describes the LTE standard defined process of a base station (cell or eNodeB) broadcasting frequency band information to the UEs in its cell regarding the downlink and uplink frequencies that it can support. This passage shown below is only describing what has been defined by the 3GPP and would have been known by a POSITA and is not in regard to the additional claim limitations of the Amended Claim.

In the LTE, a cell broadcasts, to UEs being served thereby, the frequency band information and uplink carrier frequency deployed by the own cell as broadcast information. Specifically, the frequency band information is included in the SIB1. The uplink carrier frequency is included in the SIB2. In a case where the uplink carrier frequency is not included in the SIB2, the uplink carrier frequency is derived from the downlink carrier frequency using the default value at the TX-RX frequency separation. The UE is capable of recognizing the downlink carrier frequency through cell selection or reselection and is capable of obtaining the frequency band

and uplink carrier frequency deployed by the cell the through reception of the broadcast information from the cell.

As disclosed in Non-Patent Document 1, the development of "long term evolution advanced (LTE-A)" specifications as Release 10 is pursued in 3GPP.

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Id. 8:57 – 9:5.

125. Similarly, the base station can allocate only a DL resource to the UE without necessarily allocating a UL resource regardless of whether they appear in the same row in the frequency tables cited by Patent Owner. When the base station allocates only a DL resource to the UE without allocating the UL, this results in an “unpaired” DL frequency allocated to the UE.

126. Finally, the addition of band 29 to the 3GPP specification was not for the purposes of Carrier Aggregation as implied by Patent Owner. Motion at 14-15 (citing Ex. 2009, 21-23). Nor does band 29 show for the first time in December 2012 an “unpaired” frequency band. This band 29 is a band owned by AT&T and was not allocated a UL frequency due to an overlapping frequency conflict and not, as Patent Owner alleges, to support carrier aggregation. Moreover, only AT&T can use this band, so in essence, according to Patent Owner’s argument, only AT&T would be able to support carrier aggregation. That is plainly incorrect true.

127. Therefore, the only pairing that the ’976 patent supports is a pairing from the frequency band tables that are configured for a certain UE for DL and UL. Any DL set for carrier aggregation from a secondary cell where no UL resources are configured for the UE on that secondary cell is an unpaired DL frequency as taught by the ’976 patent.

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128. Therefore, the '976 Patent does not support the additional limitations in the Amended Claim.

XI. EVEN IF IT IS DETERMINED THAT THE '976 PATENT SUPPORTS THE PROPOSED AMENDMENTS, THE AMENDED CLAIM IS NOT NOVEL OR NONOBVIOUS.

129. Even if it is determined that the '976 patent supports the proposed amendments, the Amended Claim is not novel or nonobvious for at least the following reasons.

130. The added limitations of the Amended Claim are “being included in an uplink frequency band that is paired with a first downlink frequency band,” “being included in the first downlink frequency band and” and “being included in a second downlink frequency band that is not paired with any uplink frequency band.” MTA p. 10.

XII. LIKE CLAIM 2, THE AMENDED CLAIM IS OBVIOUS OVER THE COMBINATION OF TS 36.300 V10.0.0 IN VIEW OF R2-104515

131. For the same reasons I describe in my initial declaration regarding Ground 1, Section VIII above, and the paragraphs below, I believe that the Amended Claim is obvious over the combination of TS 36.300 in view of R2-104515.

132. The Patent Owner has stated, *inter alia*, that the Amended Claim (PO also refers to this as the “substitute claim 3”) is not obvious over the combination of TS 36.000 V10.0.0 in view of R2-104515 only show “predetermined pairings of UL

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and DL frequency bands as of the priority date of the '976 Patent.” MTA p. 11, section B.1. I disagree because the Patent Owner uses flawed logic and misleading citations to support this argument as I describe in Section VIII above.

133. TS 36.300 teaches that the UE is configured by the eNB to work with the different CCs (component carriers). Ex. 2003 at 43-44 (“It is possible to configure a UE to aggregate a different number of CCs originating from the same eNB and of possibly different bandwidths in the UL and DL It is not possible to configure a UE with more UL CCs than DL CCs.”). Therefore, TS 36.300 teaches that the eNB can configure a UE with DL and UL with the same bandwidths (paired) or different bandwidths (unpaired).

134. TS 36.300 teaches an F1 (Frequency 1) component carrier representing the associated cell and the F2 (Frequency 2) representing the non-associated cell, both of which are controlled by the same base station (eNB). TS 36.300 also teaches that an uplink is not required on the non-associated cell (F2).

135. TS 36.300 teaches that Medium Access Control (“MAC”) in eNB allocates the physical layer resources for the DL-SCH and UL-SCH transport channels. Ex. 1012 at § 11.1 TS 36.300 teaches the eNB tells the Pcell (associated cell) of the DL, the Pcell of the UL, the Scell (non-associated cell) of the DL and the Scell *can* be given a grant, but if the UE is not configured for uplink, then the UE ignores it. Ex. 1012 at 81-82. Therefore, TS 36.300 teaches that the SCell may or

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may not give a grant of UL to the UE. As such, TS 36.300 teaches a PCell which allocates paired UL and DL grants to the UE and an SCell with an unpaired downlink grant.

136. R2-104515 teaches that “it is permitted that only DL resources are configured to secondary cells.” Ex. 1013, pg 1. R2-104515 also teaches how to indicate to the UE “the detailed schemes of UL absence indication for secondary cells.” Ex. 1013, pg 1.

137. R2-104515 teaches three options, the first option is to indicate a “ul-CarrierFreq” and “ul-Bandwidth” variables, which are optional. Ex. 1013, pg 1. Therefore, the eNodeB can tell the UE that there are no UL resources allocated to the UL from the secondary cell.

138. R2-104515 also teaches that the SCell itself cannot be allocated UL resources by the eNodeB, or the UL resources could be deleted from the SCell from the eNodeB. Ex. 1013, pg 2 (“UL absence: the UL resource configurations are all absent when initially configuring a secondary cell”); (“UL deletion: the UL resource configurations are all absent when re-configuring a secondary cell. Actually, UL absence and UL deletion are indicated the same way.”) Therefore, even under Patent Owner’s understanding of “paired,” R2-104515 teaches an SCell with no UL resources and therefore there are no “paired” UL and DL resources for the SCell.

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139. R2-104515 also teaches a second option which reuses the primary cell's *freqBandIndicator* for the secondary cell. Ex. 1013, pg 2. This *freqBandIndicator* is optional. Ex. 1013, pg 3. "When there is no *freqBandIndicator* in a secondary cell's configuration, UL resources will not be configured by the UE Note that when there is no *freqBandIndicator* in a secondary cell's configuration, eNB can choose to transmit or not to transmit this secondary cell's UL resources configurations to the UE.") Ex. 1013, pg 3. As such, in this case the eNB is telling the UE that it has no UL resource paired to a DL available to it. As described above, this is consistent with how the '976 patent teaches an unpaired DL resource.

140. R2-104515 also teaches a third option which uses a "ul-Presence-Indicator," which is a Boolean value. Ex. 1013, p. 3. In describing "ul-PresenceIndicator," R2-104515 provides: "Indicates whether or not the UL resources are configured. When this parameter is set to 'false', the UE ignores any UL resource configurations of the secondary cell." Ex. 1013, p. 4 Similarly, R2-104515 provides that "[w]hen *ul-PresenceIndicator* is set to 'false', UL resources will not be configured by the UE, or the UE deletes any existing UL resource configurations of this cell." Ex. 1013, pg 4. Therefore, option 3 teaches that the enodeB is telling the UE that there are no UL resources configured in the SCell, *i.e.*, there is no paired UL associated with the DL resources.

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141. Therefore, R2-104515 teaches an eNodeB that indicates to the UE that there are no UL resources to pair with the DL resources. Accordingly, the combination of TS 36.300 and R2-104515 teaches every new limitation added to the proposed new claim 3. The remaining limitations of claim 3 are likewise satisfied by the combination of TS 36.300 and R2-104515. *See* Petition at 45-62; *see also* Institution Decision at 16.

142. Regarding the new limitations added to the Amended Claim, I provide detailed support in Section VIII above regarding the Carrier Aggregation (CA) sections in TS 36.300 that disclose the LTE base station (eNodeB or eNB) allocating a downlink and uplink resource in the same paired frequency band (*the first downlink frequency band*) for the associated cell and only allocating a downlink resource for the non-associated cell in a *second downlink frequency band that is not paired with any uplink frequency band*.

143. Therefore, for the same reasons included for Ground 1 in my initial declaration and in at least Section VIII above, the Amended Claim is also invalid.

XIII. ADDITIONAL TECHNICAL SUPPORT.

- A. There is a significant difference between a 3GPP LTE Specification assigning pairs of predetermined frequencies that may be used by a base station and a UE and the base station actually allocating (using) the uplink and/or the downlink of an operating band for communication with a UE.**

144. The multiple versions of Table 5.5-1 from different versions of the TS 36.101 Specification cited by the Patent Owner are the total number of operating bands possible in an LTE network. However, not all of these bands are supported by each cellular network operator because each operator has specific licensed frequencies that are a subset of this table. Not all the base stations in a carrier's network support all the operating bands in this subset because the operator does not have licenses for all its licensed frequency bands in every geographic area. For this reason, each base station transmits the operating bands that it is able to support for its geographic area as described in the passages below from an industry publication.

Understanding Cellular Frequency Bands

Cellular frequency bands are specific ranges of radio frequencies that carriers use to provide wireless communication services. These bands are allocated by the Federal Communications Commission (FCC) and each carrier has its own set of frequency bands that they utilize for their network.

Understanding cellular frequency bands is important as it helps you understand how your mobile device connects to the carrier's network. Different frequency bands have different characteristics and can affect the coverage, capacity, and speed of your mobile connection.

The two main types of cellular frequency bands used by carriers in the United States are the low-frequency bands and the high-frequency bands. Low-frequency bands, such as 700 MHz, provide better coverage and can penetrate buildings and obstacles more effectively. High-frequency bands, such as 2.5 GHz, offer higher capacity and faster data speeds but have shorter range and are easily blocked by obstacles.

Verizon's Frequency Bands

Verizon, one of the major cellular carriers in the United States, utilizes several frequency bands for its network. The primary low-frequency band used by Verizon is 700 MHz, which provides broad coverage and better indoor penetration.

In addition to the low-frequency band, Verizon also utilizes high-frequency bands such as 1900 MHz, 1700/2100 MHz, and 2500 MHz to enhance capacity and data speeds in specific areas. These high-frequency bands are typically used in densely populated areas and urban environments.

By utilizing a combination of low and high-frequency bands, Verizon aims to provide a balance between coverage and capacity, ensuring a reliable and fast mobile experience for its customers.

AT&T's Frequency Bands

AT&T, another major cellular carrier in the United States, also utilizes a variety of frequency bands for its network. AT&T's low-frequency band is 700 MHz, which provides wide coverage and better building penetration similar to Verizon.

In addition to the low-frequency band, AT&T uses high-frequency bands such as 850 MHz, 1900 MHz, and 1700/2100 MHz to provide enhanced capacity and faster data speeds in specific areas.

Low-Frequency Bands:

- **700 MHz (Bands 12/17/29):** This is AT&T's primary low-frequency band, offering broad nationwide coverage and good building penetration. It's particularly beneficial for rural areas and ensures reliable service even in remote locations.
- AT&T also utilizes Band 14, acquired from FirstNet, which provides additional 4G capacity in specific areas.
- The availability of specific frequency bands may vary depending on location.

T-Mobile's Frequency Bands

T-Mobile, one of the major cellular carriers in the United States, utilizes a range of frequency bands to provide its network coverage. T-Mobile's low-frequency band is 600 MHz, which offers broad coverage and better signal penetration, especially in rural areas.

- **600 MHz (Band 71):** This is T-Mobile's primary low-frequency band, offering exceptional coverage across the country, particularly in rural areas and deep inside buildings. It's ideal for providing a reliable connection even in remote locations.
- T-Mobile also utilizes Band 25 (1900 MHz) for 2G and 4G services in certain areas.
- The availability of specific frequency bands may vary depending on location.

Ex. 1035 at pp. 2-7 (highlighting added).

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145. This information is broadcast to all the UEs in a cell so they will know the possible operating bands they may be assigned when they are needed. This broadcasted information is in the form of System Information Blocks (SIBs).

146. The fact that the distribution of the possible frequencies available to use for a specific base station is communicated to all the UEs listening to the base station via System Information Block (SIB) messages is confirmed by the '976 Patent with the following passages:

In the LTE, **a cell broadcasts**, to UEs being served thereby, **the frequency band information and uplink carrier frequency deployed by the own cell** as broadcast information. Specifically, the frequency band information is included in the **SIB1**. The uplink carrier frequency is included in the **SIB2**. In a case where the uplink carrier frequency is not included in the SIB2, the uplink carrier frequency is derived from the downlink carrier frequency using the default value at the TX-RX frequency separation.

Ex. 1001 8:57-65 (emphasis added).

147. The '976 Patent also lists Non-Patent Document 2 that states the following for the UE receiving the SIBs.

5.2.2.3 System information required by the UE

The UE shall:

1> ensure having a valid version, as defined below, of (at least) the following system information, also referred to as the 'required' system information:

2> if in RRC_IDLE:

3> the *MasterInformationBlock* and *SystemInformationBlockType1* as well as *SystemInformationBlockType2* through *SystemInformationBlockType8*, depending on support of the concerned RATs;

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Ex. 1036 (TS 36.331 V9.4.0—Non-Patent Document 2) p. 25 (highlighting added).

148. Thus, this broadcasting of the operating bands actually available for each base station simplifies the signaling and operation requirements. Therefore, this is not an allocation by the base station for at least the reason that all UEs in a cell are receiving the same information. The base station has an additional function of assigning specific downlink and/or uplink resources to a UE from those available in the relevant cell. This function is known as Radio Resource Control (RRC) signaling.

149. The LTE base station initially communicates its allocation for the uplink and downlink for the associated cell via Radio Resource Control (RRC) signaling protocol messages. Once the *associated cell* is connected, the base station communicates its allocation for the uplink and/or downlink for the *non-associated cell*. Basically, the RRC is a level 3 signaling protocol layer that is established between the base station and a UE when the UE initially connects to a base station.

150. The base station specifies the frequencies to be used by the associated and non-associated cells during these RRC procedures and not before as described below in Non-Patent Document 2.

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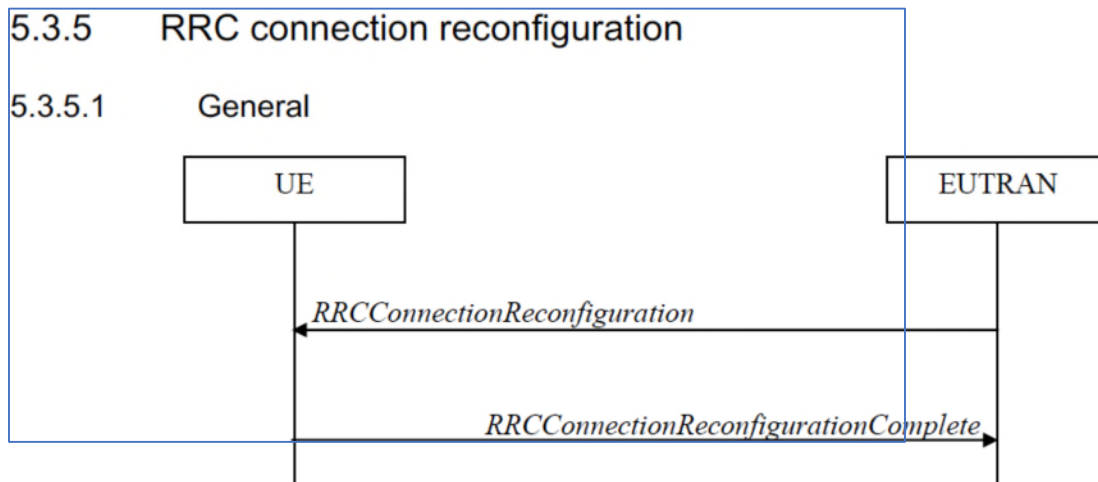


Figure 5.3.5.1-1: RRC connection reconfiguration, successful

The purpose of this procedure is to modify an RRC connection, e.g. to establish/ modify/ release RBs, to perform handover, to setup/ modify/ release measurements. As part of the procedure, NAS dedicated information may be transferred from E-UTRAN to the UE.

Ex. 1036 p. 42 (highlighting added)

151. The '976 Patent also describes what a POSITA would have known regarding the RRC configuration messages with:

In a case where CA is configured, a UE has single RRC connection with a NW. In RRC connection, one serving cell provides NAS mobility information and security input. This cell is referred to as primary cell (PCell).

Ex. 1001 9:29-32.

The SCells are reconfigured, added, or removed through RRC.

Id. 9:59-60.

152. Thus, these RRC procedures perform the is the claimed *uplink and downlink resources are configured by the base station* and not the distribution of the possible operating bands table as stated by the Patent Owner.

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XIV. CONCLUSION

153. For at least the reasons addressed above, it is my opinion that every claim of the '976 patent is invalid as obvious.

154. Additionally, for at least the reasons addressed above, it is my opinion that the Amended Claim (Substitute Claim 3) of the '976 patent is invalid as obvious.

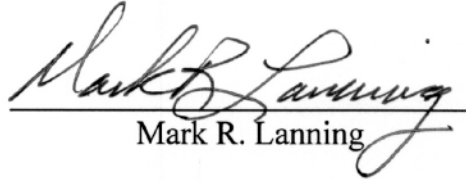
155. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

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156. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

157. I declare under penalty of perjury that the foregoing is true and correct.

Executed on: May 30, 2024


Mark R. Lanning