

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 Electric Corporation

Patent Owner

Case No. IPR2023-00997
U.S. Patent No. 10,200,976

**PETITIONERS' OPPOSITION TO
PATENT OWNER'S MOTION TO AMEND**

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PETITIONERS’ EXHIBIT LIST

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	Declaration of Mark R. Lanning
1004	C.V. of Mark R. Lanning
1005	MELCO Complaint for Case No.: 8:22-cv-1073-CJC-DFM.
1006	Exhibit D of Plaintiffs’ Preliminary Infringement Contentions.
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).

Exhibit No.	Description
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.
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	Declaration of Mark R. Lanning in Support of Opposition to Motion to Amend and Petitioner’s Reply
1029	Patent Owner’s Response
1030	3GPP TSG-RAN WG4 Meeting #65 CR R4-126923

Exhibit No.	Description
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
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)

I. INTRODUCTION

Petitioners oppose the Motion to Amend submitted by Patent Owner. Patent Owner has not shown appropriate support in U.S. Patent No. 10,200,976 (“the ’976 patent”) for the substitute claim. Further, the substitute claim is unpatentable as anticipated and obvious under 35 U.S.C. §§ 102 and 103 in view of the prior art of record.

The prior art applied in Grounds 1-3 of the Petition anticipates or render obvious the proposed substitute claim because the prior art meets all aspects of the proposed substitute claim.

II. THE PROPOSED CLAIM INTRODUCES NEW MATTER

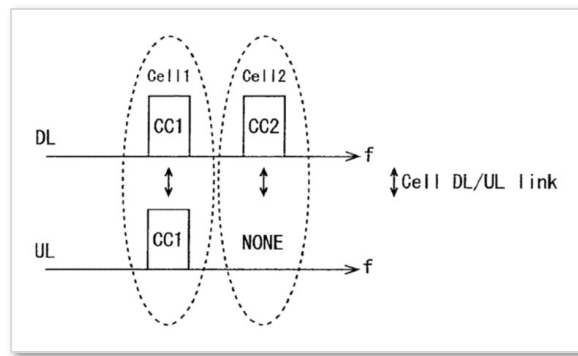
The proposed substitute claim should be denied under 37 C.F.R. § 42.121(a)(2)(ii) because it introduces new matter.

A. The ’976 Patent Does Not Provide Support for a UE Allocated with an associated cell with Paired Uplink and Downlink Resources and a non-associated cell with Only a Downlink Resource and the Downlink Resource is Not Paired to an Uplink Resource

Original claim 2 is directed to, *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). Ex. 1001, 54:35-48; Ex. 1028, ¶44. In other words, the associated cell has a downlink

and an uplink, and the non-associated cell has just a downlink for communicating with the base station. Ex. 1028, ¶44.

The requirements for original claim 2 are shown in Fig. 28 of the '976 Patent and the accompanying written description. Cell1 in the figure is also referred to in the written description as the “PCell” or the associated cell. Cell 2 is also referred to as the “SCell” or the non-associated cell. Ex. 1028, ¶45. Thus, Cell1/associated cell has downlink (DL) and uplink (UL) resources. Ex. 1028, ¶45. The Cell2/non-associated cell only has a “DL.” Ex. 1028, ¶45.



Ex. 1001, Fig. 28. Relatedly, the '976 patent provides as follows:

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.

...

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 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,

where 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.

Ex. 1001, 33:1-25 (emphasis added).

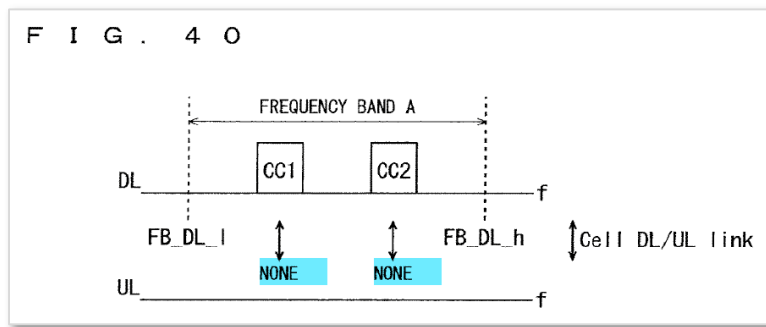
This description clearly relates to the “First Embodiment” of the ’976 Patent. See Ex. 1001, 14:15. However, instead of citing to the First Embodiment/Fig. 28 (or a similar figure) to support its Motion to Amend, Patent Owner cited a “Third Embodiment.” Ex. 1028, ¶47; see also Ex. 1001, 49:10. The Third Embodiment is not relevant to Claim 2 (or substitute claim 3) because the Third Embodiment does not have any uplinks; rather, it discloses only two downlinks (one in the PCell/associated cell and one in the SCell/non-associated cell). Such an arrangement does not meet the limitation of the associated cell having a downlink and an uplink. Ex. 1028, ¶47. Further, the Second Embodiment (described at 35:46-49:7) deals with UL and DL CC in different frequency bands, not paired DL and UL frequency bands, and is therefore similarly inapplicable to proposed claim 3. Ex. 1001, 35:49-52.

Patent Owner’s citations do not provide support for the new limitations of proposed claim 3. Patent Owner cites 49:46-57 (description of the Third

Embodiment), Fig. 41 (depiction of the Third Embodiment), as well as 48:58-67 and 32:40-50, as alleged support for the claim amendment “the other resource for downlink being included in a second downlink frequency band that is not paired with any uplink frequency band.” Motion at 7. With respect to 48:58-67, this passage relates to the Third Embodiment with 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; Ex. 1028, ¶107. 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; Ex. 1028, ¶107. 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. Ex. 1028, ¶107. 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. Ex. 1028, ¶107.

Figure 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).

Figure 40 is described by the '976 patent as follows:

Third Embodiment

...

There is no configuration of a UL CC being a resource for the 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 the UL to be 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.

Ex. 1001, 49:9-30. Therefore, the portions of the '976 patent cited by Patent Owner do not support the claim amendments because the embodiments disclosed at those portions do not have any uplinks in the PCell/CC1.

Patent Owner also erroneously cites Fig. 41 and its accompanying written description as alleged support for substitute claim 3 under the heading "Innovation of the '976 Patent to Enable Base Station to Configure Cell with DL Resources Only." Motion at 7-9. As with Fig. 40 above, Fig. 41 and the cited portions (from the Third Embodiment) are also irrelevant because Fig. 41 shows a configuration with **no uplinks**. Ex. 1028, ¶51. Fig. 41 and its description text are as follows.

F I G . 4 1

Band	Uplink (UL) operating Band	Downlink (DL) operating Band	Duplex Mode
	F _{UL_low} — F _{UL_high}	F _{DL_low} — F _{DL_high}	
A	—	FB_DL_l — FB_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 (emphasis added).

As with Fig. 40, Fig. 41 also relates to the Third Embodiment and the accompanying written description clearly states that no uplinks are allocated. Ex.

1028, ¶52. Accordingly, Fig. 41 and the accompanying written description do not support the amendments for substitute claim 3. Ex. 1028, ¶52.

The long list of passages cited in Patent Owner's chart on page 4 of its Motion is similarly unresponsive. *See* Motion at 4.

The '976 patent describes a "First Embodiment" at paragraphs [0091]-[0251] of Ex. 2012. Figures 1-29 correspond to the First Embodiment.

Claim 1 of Ex. 2012 does not support a limitation that the DL resource for the non-associated cell is not paired with a UL resource. Figures 1-28 similarly do not support a limitation that the DL resource for the non-associated cell is not paired with an uplink resource, unless Patent Owner is taking the position that this limitation means only that no UL resource has been allocated to the non-associated cell. If so, the new limitations of proposed claim 3 do not further limit existing claim 2. Paragraphs [0081], [0083], [0129], [0141]-[0143], [0157] likewise do not support the new limitations of proposed claim 3. Indeed, these paragraphs teach nothing more than the material recited in original claim 2.

Accordingly, Patent Owner's Motion to Amend should be denied for adding new material under 37 C.F.R. § 42.121(a)(2)(ii).

B. The '976 Patent Does Not Provide Support for Unpaired Downlink Resources

The '976 patent does not disclose a base station that has only unpaired downlink resources. 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's supplier of the *possible* operating frequency bands that *may be* supported by a specific cell; a subset of this table that includes only the licensed operating bands for a cellular network operator in a specific geographic area is broadcast to every UE in the base station's serving area. Ex. 1028, ¶110. A frequency in the table is not allocated to a UE until the base station sends an RRC signaling message specifying the frequencies the UE should use for downlink and uplink. Ex. 1028, ¶110. 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. Ex. 1028, ¶110.

In fact, 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; *see also* Ex. 1028, ¶113. 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... 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 frequency bands. It does not indicate that the base station does not have paired UL and DL frequency bands. Ex. 1028, ¶113. 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.

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. Ex. 1028, ¶114. 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; Ex. 1028, ¶114. 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:

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
30					
31					
32					
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).

Patent Owner fails 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 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. Ex. 1028, ¶115. This pairing is required by FDD as discussed above. Therefore, this downlink channel is in fact paired contrary to Patent Owner’s argument. Ex. 1028, ¶115. Further evidence

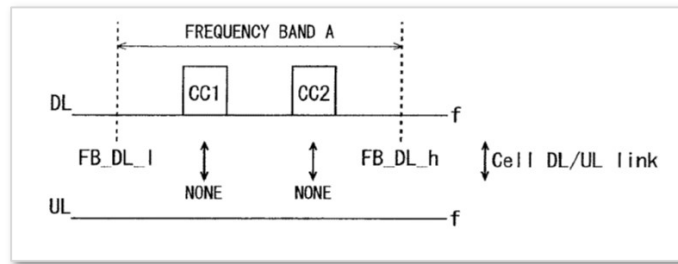
supports that band 29 is a paired DL and UL band. Ex. 1028, ¶¶ 35-41. As such, the sole evidence that Patent Owner relies on to allegedly show that a lack of pairing did not exist until after the filing date of the '976 patent instead shows that the downlink is indeed paired. Patent Owner's argument is refuted by the evidence.

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. Ex. 1028, ¶116. The '976 patent describes the frequency bands in the charts as "associated with each other." Ex. 1001, 35:53-57; Ex. 1028, ¶116. 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; Ex. 1028, ¶116. 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 also states that the "ul-CarrierFreq" of the SIB2 discloses these predetermined pairings to the UE. Ex. 1001, 35:66-36:9; Ex. 1028, ¶116.

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; Ex. 1028, ¶117. Therefore, the Second Embodiment does not teach a DL frequency band that is not associated with an UL

frequency band; rather, the Second Embodiment pairs a DL CC with an UL CC from different frequency bands. Ex. 1001, 26: 14-20; Ex. 1028, ¶117.

The Third Embodiment of the '976 Patent, shown in Fig. 40, includes one or more resources for DL configured without a single resource for UL to be associated therewith. Ex. 1001, 49:17-21.



Ex. 1001, Fig. 40.

This is shown in Figure 41 of the '976 patent, which shows “an example of a frequency band configured by one or more resources for DL without a resource for UL to be associated therewith.” Ex. 1001, 49: 46-48.

Band	Uplink (UL) operating Band	Downlink (DL) operating Band	Duplex Mode
	F _{UL_low} — F _{UL_high}	F _{DL_low} — F _{DL_high}	
A	—	FB_DL_l — FB_DL_h	FDD

Ex. 1001, Fig. 41.

However, in this case, 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; Ex. 1028, ¶118. 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; Ex. 1028, ¶118.

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. 1028, ¶¶119-120; *see also* Ex. 1001, 50:11-15.

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. Ex. 1028, ¶121.

III. THE PROPOSED CLAIM IS UNPATENTABLE

The Board should also deny the motion because proposed claim 3 is unpatentable as anticipated and obvious in view of the prior art already of record.

A. Patent Owner Misunderstands the Prior Art's Implementation of “paired” Frequency Bands

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 an DL frequency bands as of the priority date of the '976 Patent” is incorrect. *See* Motion at 11, § B.1. Ex. 1028, ¶122.

The “pairings” disclosed in the 3GPP LTE specification are predetermined frequencies available for possible use by all UEs. Ex. 1028, ¶123. This is confirmed by the '976 patent which states that the supported “paired” frequencies

by a base station are broadcast to all UE's through the SIB1. Ex. 1028, ¶123. (citing Ex. 1001, 8:57-65). These paired frequencies 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. Ex. 1028, ¶123. These so-called predetermined "pairings" are merely potentially available to all UE's, not what is necessarily allocated to a specific UE by a specific base station. Ex. 1028, ¶123. Thus, the operating bands in the various tables cited by Patent Owner are only possible bands; however, not all base stations are able to support all of the bands in these tables. Ex. 1028, ¶123. Again, these predetermined operating bands are not an allocation by the base station to the UE of UL and DL frequencies (resources). Ex. 1028, ¶123. The base station configures the UL and DL resources for a UE through the use of RRC signaling. Ex. 1028, ¶123.

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. Ex. 1028, ¶125. When the base station allocates only a DL resource to the UE without allocating the UL resource, this results in an "unpaired" DL frequency being allocated to the UE. Ex. 1028, ¶125.

Finally, the addition of band 29 to a later version of a 3GPP specification was not for the purposes of Carrier Aggregation as implied by Patent Owner.

Motion at 14-15 (citing Ex. 2009, 21-23); Ex. 1028, ¶126. 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. Ex. 1028, ¶126. 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. Ex. 1028, ¶126.

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. Ex. 1028, ¶127. In a carrier aggregation operation, a DL resource 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. Ex. 1028, ¶127.

Patent Owner’s erroneous application of the concept of “pairing” is fatal to its motion, as discussed in further detail below.

**B. TS 36.300 V10.0.0 (Ex. 1012) in View of R2-104515 (Ex. 1013)
Renders Claims 2 and Proposed 3 Invalid**

Patent Owner only argues that TS 36.300 V10.0.0 and R2-104515 do not teach the base station configuring the “non-associated cell” of claim 2 and make no comments regarding whether these references teach the new claim elements of claim 3. Motion at 15.

1. TS 36.300 V10.0.0 (Ex. 1012) in View of R2-104515 (Ex. 1013) Renders Claim 2 Invalid

a. TS 36.300 V10.0.0 (Ex. 1012) Renders Proposed Claim 2 Invalid

Patent Owner's argument is based on a "red herring" argument regarding predetermined operating bands. Ex. 1028, ¶15. However, these predetermined operating bands are not the resources for an uplink or downlink configured by the base station for the non-associated cell. Ex. 1028, ¶¶15-18. This list of operating bands is not performing the required configurations of claim 2, instead the required configuration occurs when the base station sends configuration commands to the UE. Ex. 1028, ¶19. Nor are the predetermined operating bands always assigned for both the downlink and the uplink. Ex. 1028, ¶¶21-22. In fact, TS-36.300 clearly teaches that the non-associated cell can have one downlink and zero uplinks assigned to a UE. Ex. 1028, ¶¶22-25 (citing Ex. 1012 at p. 49); Petition at 60-61. TS-36.300 also clearly teaches that it is the base station that is configuring the secondary cell with UL and DL resources through the use of the Radio Access Bearer channel assignments made by the eNodeB. Ex. 1003, ¶¶132-133. This is consistent with the teachings of the '976 patent which concedes that the LTE standards defined CA configuration with fewer total uplinks than downlinks. Ex. 1028, ¶26. Further, Patent Owner's infringement contentions read TS-36.300, and

related versions, as teaching this claim limitation. Ex. 1028, ¶¶28-32. Patent Owner ignores that fact.

b. R2-104515 (Ex. 1013) Renders Proposed Claim 2 Invalid

R2-104515 also teaches a base station that configures a non-associated cell to have only downlink resources. Petition at 61 (citing Ex. 1013 at 1 (“Meanwhile, it is permitted that only DL resources can be configured to secondary cells.”)) Therefore, Patent Owner’s suggestion 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 is just not true. Motion at 30.

R2-104515 teaches that “it is permitted that only DL resources are configured to secondary cells.” Ex. 1013, pg 1; Ex. 1028, ¶136. R2-104515 also teaches how to indicate to the UE “the detailed schemes of UL absence indication for secondary cells.” Ex. 1013, pg 1; Ex. 1028, ¶136.

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 for the UL to the secondary cell. Ex. 1028, ¶137.

R2-104515 also teaches that the SCell itself may not be allocated just UL resources by the eNodeB, or that 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.”); Ex. 1028, ¶138. Therefore, even under Patent Owner’s understanding of “paired,” R2-104515 teaches a base station configuring an SCell with no UL resources and therefore there are no “paired” UL and DL resources for the SCell. Ex. 1028, ¶138.

R2-104515 also teaches a second option which reuses the primary cell’s *freqBandIndicator* for the secondary cell. Ex. 1013, pg 2; Ex. 1028, ¶139. 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 to not 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. Ex. 1028, ¶139. As described above, this is consistent with how the ’976 patent teaches an unpaired DL resource. Ex. 1028, ¶139.

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 tells the UE that there are no UL resources configured in the SCell, *i.e.*, there is no paired UL associated with the allocated DL resource. Ex. 1028, ¶140.

2. TS 36.300 V10.0.0 (Ex. 1012) in View of R2-104515 (Ex. 1013) Renders Proposed Claim 3 Invalid

a. TS 36.300 V10.0.0 (Ex. 1012) Renders Proposed Claim 3 Invalid

In fact, TS 36.300 discusses 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."); Ex. 1028, ¶133. 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). Ex. 1028, ¶133.

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). Ex. 1028, ¶134. TS 36.300

also teaches that an uplink is not required on the non-associated cell (F2). Ex. 1028, ¶134.

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; Ex. 1028, ¶135. 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; Ex. 1028, ¶135. Therefore, TS 36.300 teaches that the SCell may or 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. Ex. 1028, ¶135.

b. R2-104515 (Ex. 1013) in Combination with TS 36.300
Renders Proposed Claim 3 Invalid

R2-104515 teaches the claim elements related only to secondary cells. Therefore, the only new claim 3 element related to R2-104515 is “the other resource for downlink being included in a secondary downlink frequency band that is not paired with any uplink frequency band.” R2-104515 teaches that “it is permitted that only DL resources are configured to secondary cells. Ex. 1013 at 1. Therefore, because the non-associated cell taught by R2-104515 only has downlink resources, there is no paired uplink resources for that cell configured by the base

station. As described above, TS 36.300 also teaches every new element of proposed claim 3.

Therefore, R2-104515 teaches an eNodeB that indicates to the UE that there are no UL resources to pair with the DL resources. Ex. 1028, ¶141. 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. Ex. 1028, ¶141.

C. TS 36.300 and R2-104515 Each Teach Claim Element 2[3]

Petitioner's have only alleged that Malladi does not teach the last claim element of claim 2 and the new element of an unpaired downlink resource in the non-associated cell added to claim 3.

1. Malladi Teaches Original Claim 2

Malladi teaches the original claim limitation 2[3], "to include only another resource for downlink, the other resource for downlink being allocated to the downlink communication from the base station device." Petition at 70-72; Ex. 1028, ¶¶64-75. At the institution stage, the Board indicated that the Petition did not make a sufficient showing in this regard.

However, Malladi teaches that at the cell level there can be more downlink carriers than uplink carriers ($N > M$). Ex. 1028, ¶¶67-69 (citing Ex. 1023 ¶¶ [0090 –

0093]). While Figure 1 of Malladi shows cell 120B having two uplink carriers, this is for a symmetric system. However, Malladi teaches for an asymmetric system, the number of downlink carriers (N) can be one and the number of uplink carriers (M) can be 0. Ex. 1028, ¶¶70-72. Therefore, for non-associated cell 120B, Malladi teaches the claim element “to include only another resource for downlink, the other resource for downlink being allocated to the downlink communication from the base station device.” Ex. 1028, ¶75.

2. *Malladi Teaches the New Limitations of Proposed Claim 3*

Patent Owner does not allege that Malladi does not teach the new claim limitations of claim 3; rather, Patent Owner only challenges that Malladi does not teach or suggest a cell with downlink resources only. Motion at 43.

Malladi teaches paired carriers with both uplink and downlink resources. Specifically, Malladi describes multi-carrier communication systems are based on two or more carrier frequencies with multi-carrier capability in both the uplink and downlink or only on the downlink. Ex. 1028, ¶¶76-77 (citing Ex. 1023, ¶ [0007]).

Malladi discloses using paired frequency bands when the number of downlink carriers and uplink carriers configured for a cell are equal. Ex. 1028, ¶77 (citing Ex. 1023, ¶ [90-92]). 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 (i.e. 0 uplink carriers are allocated

for the non-associated cell as discussed above). Ex. 1028, ¶77 (citing Ex. 1023, ¶[0090-0092]). Malladi discloses the new claim 3 limitations. Ex. 1028, ¶78.

D. Ground 3 - Malladi (Ex. 1023) in Combination with TS 25.319 (Ex. 1015) teaches the “Non-Associated Cell” of Claim 2.

Even if the Board determines that Malladi does not teach this limitation, TS 25.319 does. Specifically, Patent Owner alleges that TS 25.319 does not teach a base station configuring a cell to have downlink resources only. Motion at 44. The Board seemed to have questions regarding the differences between Serving E-DCH cells and Secondary Serving E-DCH cells. ID at 24. Mr. Lanning has addressed those questions. Ex. 1028, ¶¶88-99. TS- 25.319 teaches that the secondary serving E-DCH Cell is a dual cell from which the UE receives absolute grants from the Node-B on the secondary downlink. *Id.* at ¶94. The UE can have zero or one serving E-DCH cell on the secondary uplink carrier, meaning a UE can have zero or one Serving E-DCH cell. *Id.* at ¶¶94-96. (citing Ex. 1015 (TS 25.319) at p. 7). 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. *Id.* at ¶97. A POSITA would understand from 3GPP Release 9 that 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 one because it **cannot be equal or more than the total number of downlink CCs.** *Id.* at ¶99.

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

E. Ground 3 - Malladi (Ex. 1023) in Combination with TS 25.319 (Ex. 1015) teaches the new limitations of Claim 3.

Patent Owner does not challenge that TS 25.319 teaches the new claim limitations of claim 3, Patent Owner suggests that TS 25.319 does not teach the “Non-Associated Cell” of claim 2. Motion at 43.

As discussed above, TS 25.319 teaches a non-associated cell with downlink resources only. Therefore, TS 25.319 teaches the “other resource for downlink being included in a second downlink frequency band that is not paired with any uplink frequency band” claim limitation of claim 3. Since there is no uplink

frequency configured for this cell, there is no uplink frequency that is paired with the downlink frequency.

Therefore, Malladi alone (Ground 2) or Malladi in combination with TS 25.319 (Ground 3) teach the new claim 3 limitation “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.”

IV. CONCLUSION

Patent Owner's Motion to Amend should be denied.

Dated: May 30, 2024

Respectfully submitted,

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PROPOSED CLAIM LISTING APPENDIX

Claim Element	Claim Language
Claim 3 (Contingent substitute for claim 2)	A communication terminal device performing radio communication with a base station device, wherein
3[A]	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,
3[B]	the resource for uplink <u>being included in an uplink frequency band that is paired with a first downlink frequency band and</u> being allocated to the uplink communication to the base station device,
3[C]	the resource for downlink <u>being included in the first downlink frequency band and</u> being allocated to the downlink communication from the base station device, and
3[D]	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,
3[E]	the other resource for downlink <u>being included in a second downlink frequency band that is not paired with any uplink frequency band and</u> being allocated to

	the downlink communication from the base station device.
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CERTIFICATE OF SERVICE

I certify that the foregoing Petitioners' Opposition to Patent Owner's Motion to Amend and Exhibits 1028-1036 were served on Patent Owner's counsel of record by electronic notification through P-TACTS and email to:

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Date: May 30, 2024

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