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Paper No. 11
Filed: June 4, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE, INC., LG ELECTRONICS INC.,
SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.
Petitioner,

v.

UNILOC 2017 LLC
Patent Owner.

Case IPR2019-00252
Patent 7,167,487 B2

Before ROBERT J. WEINSCHENK, JOHN F. HORVATH, and
SEAN P. O'HANLON, *Administrative Patent Judges.*

HORVATH, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
35 U.S.C. § 314(a)

I. INTRODUCTION

A. Background

Apple Inc., LG Electronics Inc., Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. ("Petitioner")[1] filed a Petition requesting *inter partes* review of claims 11–13 ("the challenged claims") of U.S. Patent No. 7,167,487 B2 (Ex. 1001, "the '487 patent"). Paper 5 ("Pet."), 4. Uniloc 2017 LLC ("Patent Owner"), filed a Preliminary Response. Paper 9 ("Prelim. Resp."). We have authority under 35 U.S.C. § 314. Upon consideration of the Petition and Preliminary Response we are persuaded that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of at least one challenged claim of the '487 patent. Accordingly, we institute *inter partes* review of all challenged claims on all grounds raised.

B. Related Matters

Petitioner and Patent Owner identify various matters between Uniloc USA, Inc. or Uniloc 2017 LLC, and Apple, Inc., Blackberry Corp., HTC America, Inc., Huawei Device USA, Inc., LG Electronics USA, Inc., Microsoft Corp., Motorola Mobility, LLC, Samsung Electronics America, Inc., or ZTE (USA), in various Federal District Courts, including District Courts for the Eastern, Western, and Northern Districts of Texas, the Central and Northern Districts of California, the District of Delaware, and the Western District of Washington, as matters that can affect or be affected by this proceeding. See Pet. 76; Paper 7, 2.

[1] Petitioner identifies LG Electronics U.S.A., Inc. and LG Electronics Mobilecomm U.S.A. Inc. as real parties-in-interest. Pet. 72.

C. Evidence Relied Upon[2]

References		Effective Date[3]	Exhibit
MAC protocol specification (Release 1999), 3rd Generation Partnership Project, 3GPP TS 25.321 V3.6.0 (2000–12) ("TS 25.321").		Dec. 10, 2000	1007
Corrections to logical channel priorities in MAC protocol, 3rd Generation Partnership Project, 3GPP TSG-RAN WG2 Meeting #18 ("R2-010182").		Jan. 23, 2001	1008
Services provided by the physical layer (Release 1999), 3rd Generation Partnership Project, 3GPP TS 25.302 V3.6.0 (2000–09) ("TS 25.302").		Oct. 16, 2000	1009
Peisa	US 6,850,540 B1	Feb. 25, 2000[4]	1013

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

References	Basis	Claim(s) Challenged
TS 25.321, TS 25.302, and R2-010182	§ 103(a)	11–13
Peisa	§ 103(a)	11–13

[2] Petitioner also relies upon the Declarations of R. Michael Buehrer, Ph.D., FIEEE (Ex. 1002) and Craig Bishop (Ex. 1006).

[3] Petitioner relies upon the Bishop Declaration to establish the public availability of TS25.302, TS25.321, and R2-010182, and their respective publication dates. *See* Pet. 9, 12, 16.

[4] Petitioner relies on the U.S. filing date of Peisa to establish its availability as prior art under 35 U.S.C. § 102(e). *See* Pet. 19.

II. ANALYSIS

A. The '487 Patent

The '487 patent "relates to a network with a first plurality of logic channels with which is associated a second plurality of transport channels . . . for the transmission of transport blocks formed from packet units of the logic channels." Ex. 1001, 1:4–8. According to the '487 patent, "[s]uch a network is known from the 3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN; Working Group 2 (WG2); Radio Interface Protocol Architecture; TS 25.302 V3.6.0." *Id.* at 1:9–12.

The '487 patent describes the 3GPP network architecture disclosed in TS 25.302 V3.6.0 as follows:

> A physical layer offers transport channels or transport links to the MAC [Media Access Control] layer. The MAC layer makes logic channels or logic links available to an RLC layer (RLC=Radio Link Control). The packet units formed in the RLC layer are packed in transport blocks in the MAC layer, which blocks are transmitted from the physical layer through physical channels to a terminal, or the other way about, by the radio network control. Apart from such a multiplex or demultiplex function, the MAC layer also has the function of selecting suitable transport format combinations (TFC). A transport format combination represents a combination of transport formats for each transport channel. The transport format combination describes inter alia how the transport channels are multiplexed into a physical channel in the physical layer.

Id. at 1:14–28. This architecture is illustrated in in Figure 2 of the '487 patent, which is reproduced below.

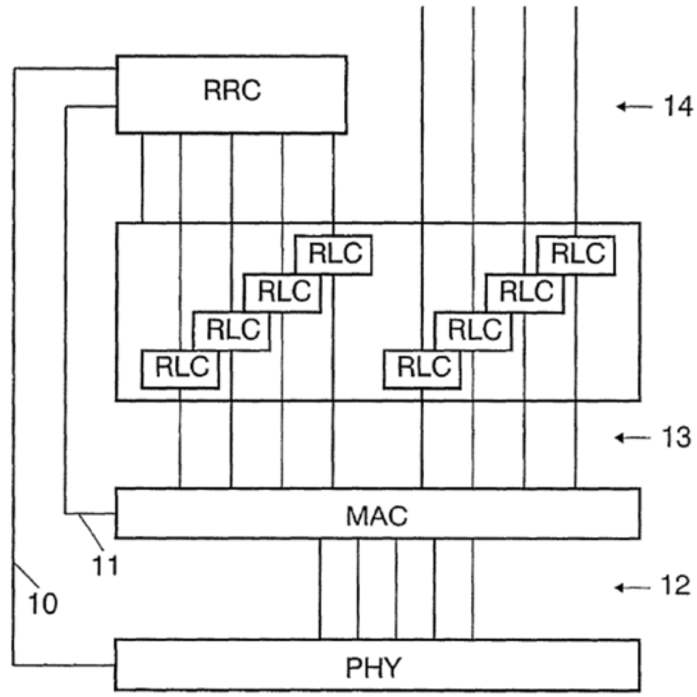


FIG. 2

Figure 2 is a "layer model" illustrating the various functions of a terminal or radio network control in a 3GPP wireless network. *Id.* at 4:63–64, 6:9–16. The "layer model" includes a physical layer (PHY), a data connection layer (MAC and RLC), and a radio resource control layer (RRC). *Id.* at 6:16–19. The RRC layer is responsible for signaling between a wireless terminal and a base station's radio network controller (RNC), and "controls the layers MAC and PHY via control lines 10 and 11." *Id.* at 6:22–27. The RLC layer receives data in the form of packet units from application channels 14. *Id.* at 6:32–35. The MAC layer makes logic channels 13 available to the RLC layer. *Id.* at 6:30–32. The PHY layer makes transport channels 12 available to the MAC layer. *Id.* at 6:29–30.

The MAC layer packs RLC layer packet units into transport blocks that are transmitted from a base station's radio network controller to a mobile terminal, or vice versa, through a radio channel. *Id.* at 6:34–37. It does so by selecting a suitable transport format combination from a set of transport format combinations. *Id.* at 6:37–40. Each transport format combination describes "how the transport channels are multiplexed into a physical channel in the physical layer (time multiplex)." *Id.* at 6:42–45. The MAC layer selection is performed by a selection algorithm that can be implemented in hardware or software, and in a mobile station or radio network controller. *Id.* at 7:43–47. The selection algorithm selects a transport format combination based on MAC logic channel priorities (MLPs), RLC layer data buffer occupancies (BOs), and transport channel transmission time intervals (TTIs). *Id.* at 7:15–22.

The '487 patent is directed toward "an optimized selection process for selecting a suitable transport format combination." *Id.* at 1:29–31. The optimized selection process integrates into the MAC selection algorithm "the condition that a minimum bit rate can be guaranteed suitable for the respective logic channels." *Id.* at 1:61–65.

B. Illustrative Claims

Although not challenged, claim 1 of the '487 patent is an independent and representative claim, and is reproduced below.

> 1. A network with a first plurality of logic channels with which is associated a second plurality of transport channels, which transport channels are provided for transmitting transport blocks formed from packet units of the logic channels, wherein a plurality of valid transport format combinations is allocated to the transport channels, which combinations indicate the transport blocks provided for transmission on each transport channel, wherein a selection algorithm is provided for selecting the

> transport format combinations, and wherein the selection algorithm uses a minimum bit rate criteria applicable to the respective logic channel.

Ex. 1001, 14:40–50.

Claim 11 is an independent claim that recites a radio network controller for a network having the properties of the network recited in claim 1. *Compare id.* at 16:26–40, *with id*. at 14:40–50. Claim 12 is an independent claim that recites a terminal for a network having the properties of the network recited in claim 1. *Compare id.* at 16:41–53, *with id*. at 14:40–50. Lastly, claim 13 is an independent claim that recites a method of controlling a network having the properties of the network recited in claim 1. *Compare id.* at 16:54–65, *with id*. at 14:40–50.

C. Claim Construction

In an *inter partes* review filed before November 13, 2018, claim terms of an unexpired patent are given their broadest reasonable interpretation in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340. Under the broadest reasonable interpretation standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only claim terms which are in controversy need to be construed and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Neither Petitioner nor Patent Owner propose any construction for any claim term. *See* Pet. 21–22; Prelim. Resp. 20–21. Rather, both parties agree that no claim term requires express construction, and that all terms should be understood to have their broadest reasonable interpretation in light of the specification. Pet. 21–22; Prelim. Resp. 20–21. We agree. Accordingly, for purposes of this Decision, we decline to expressly construe any claim term.

D. Overview of the Prior Art

1. TS 25.321

TS 25.321 is a specification of the UMTS (Universal Mobile Telephone System) MAC layer protocol. Ex. 1007, 6. The specification describes, *inter alia*, the architecture, channel structure, functions, protocol data units (PDUs), formats, and parameters of the MAC layer. *Id.* The channel structure includes transport channels between the MAC layer and Layer 1 (e.g., Forward Access Channel or FACH), and logical channels between the MAC and RLC layers (e.g., Broadcast Control Channel or BCCH). *Id.* at 15–16. The MAC layer functions include mapping logical channels to transport channels, selecting transport formats for each transport channel, handling data flow priorities, and multiplexing (demultiplexing) PDUs from higher protocol layers into (from) transport blocks delivered to (received from) physical layer transport channels. *Id.* at 17–18.

The MAC architecture for a mobile terminal or user equipment (UE) is illustrated in Figure 4.2.3.1.1 of TS 25.321, which is reproduced below.

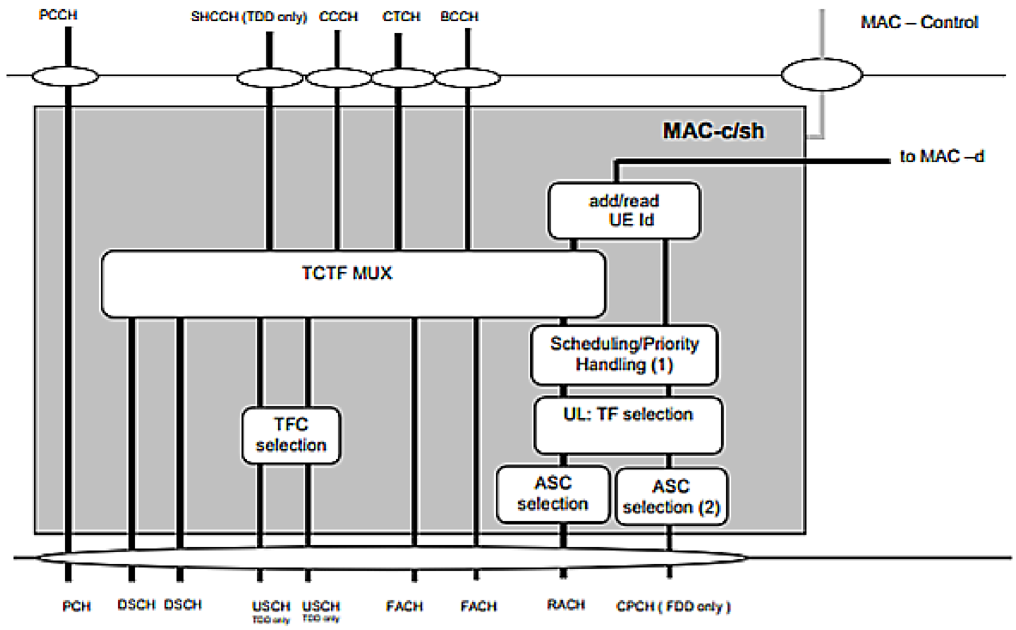


Figure 4.2.3.1.1 of TS 25.321 is a schematic illustration of the MAC layer on the UE side of the network. *Id.* at 11. The figure illustrates the mapping of logical channels (e.g., BCCH) to transport channels (e.g., FACH), which "depends on the multiplexing that is configured by RRC." *Id.* at 9. In particular, RRC maps logical channels to transport channels by generating a set of transport format combinations (TFCs), and the MAC layer selects one of these TFCs to fit PDUs from the RLC layer into available transport blocks on the transport channels. *Id.* at 9–10.

TS 25.321 discloses another function of the MAC layer—handling different priorities for different UE data flows. *Id.* at 17. In particular, the RRC assigns a priority value—MLP or MAC Logical channel Priority—between 1 and 8 for each logical channel, and the MAC layer selects a TFC "according to the priorities between logical channels indicated by RRC." *Id.* at 30, 38. The logical channel priorities are absolute, allowing the MAC to "maximize the transmission of high priority data." *Id.*

In addition to disclosing the UE MAC layer architecture and functionality, TS 25.321 discloses the RNC (Radio Network Controller) MAC layer architecture and functionality, which exists on the UTRAN (UMTS Terrestrial Radio Access Network) side of the network. *See id*. at 12–15. The RNC MAC layer architecture and functionality is "similar to the UE case with the exception that there will be one MAC-d for each UE and each UE (MAC-d) that is associated with a particular cell may be associated with that cell's MAC-c/sh." *Id.* at 12. Moreover, the "MAC-c/sh is located in the controlling RNC while MAC-d is located in the serving RNC." *Id.*

2. R2-010182

R2-010182 is a proposal for "[c]orrections to logical channel priorities in MAC protocol." Ex. 1008, 1. Specifically, R2-010182 is a change request that proposes a modification to TS 25.321 affecting both the UE and RAN. *Id.* at 4. R2-010182 introduces "new parameters to characterise [sic] MAC logical channels for TFC selection," and modifies the TFC selection algorithm "to take into account these new parameters." *Id.* Newly introduced parameters, MinGBr, MaxBr, and TW "complete the current MLP for representing logical channel priorities." *Id.* at 1.

R2-010182 identifies a number of problems with "the current algorithm proposed for TFC selection in MAC . . . because of its absolute priority scheme." *Id.* One identified problem was the absolute priority algorithm's inability to accurately characterize the quality of service needed by "all the applications foreseen in UMTS" because "[t]here is only one way to represent the quality of service at logical channel level (MLP)." *Id.* Another problem was the systematic way the algorithm prevented low priority logical channels from transmitting data on transport channels because "[l]ogical channels of higher MLP [lower priority] can never preempt lower MLP [higher priority] logical channels." *Id.* at 2.

R2-010182 proposed introducing three "new parameters completing MLP to express accurately the needs of different applications in term[s] of bit rate." *Id.* The new parameters are "TW" representing "the time period on which the allocated bit rate for the logical channel is estimated" based on a number of previous TTI (transmission time intervals); "MinGBr" representing the minimum guaranteed bit rate or "basic needs of the logical channel," and "MaxBr" representing "the nominal needs of the logical channel." *Id.*

R2-010182 assigns separate values for the parameters MLP, TW, MinGBr, and MaxBr characterizing logical channels in the proposed TFC selection algorithm. This is shown in the table provided on page 2 of R2-010182, which is reproduced below.

	LC1	LC2
MLP	**1**	**2**
TW(TTI)	**3**	**4**
MinGBr	**100**	**100**
MaxBr	**200**	**200**

The Table shows how separate values of MLP, TW, MinGBr, and MaxBr are assigned to logical channels LC1 and LC2. In particular, logical channel LC1 is assigned a priority (MLP) of 1, a minimum guaranteed bit rate (MinGBr) of 100 bits/TW measured over a time window (TW) of 3 TTI, and a maximum bit rate (MaxBr) of 200 bits/TW measured over the 3 TTI time window. *Id.* It also shows that logical channel LC2 is assigned a priority

(MLP) of 2, a minimum guaranteed bit rate (MinGBr) of 100 bits/TW measured over a time window (TW) of 4 TTI, and a maximum bit rate (MaxBr) of 200 bits/TW measured over the 4 TTI time window. *Id.*

The proposed algorithm tries "to reach the MinGBr for each logical channel in . . . descending order of priority," and upon achieving that goal tries "to reach the MaxBr for each logical channel in . . . descending order of priority," and upon achieving that goal tries "to serve the logical channels which still have remaining data (best effort), still in . . . descending order of priority." *Id.*

3. TS 25.302

TS 25.302 is "a technical specification of the services provided by the physical layer of UTRA [UMTS Terrestrial Radio Access] to upper layers." Ex. 1009, 7. TS 25.302 discloses that "[t]he physical layer offers data transport services to higher layers . . . . through the use of transport channels via the MAC sub-layer." *Id.* at 10. The physical layer operates "according to the L1 radio frame timing," and the timing of transport blocks or "the data accepted by the physical layer to be jointly encoded . . . . is then tied exactly to this L1 frame timing." *Id.*

TS 25.302 discloses that transport blocks are transmitted as transport block sets "exchanged between L1 and MAC at the same time instance using the same transport channel." *Id.* at 17. Transport block sets are "transferred by the physical layer on the radio interface" over a transmission time interval (TTI). *Id.* The TTI is "defined as the inter-arrival time of Transport Block Sets," and is "always a multiple of the minimum interleaving period (e.g., 10ms, the length of one Radio Frame)." *Id.* This is illustrated in Figure 6 of TS 25.302, which is reproduced below.

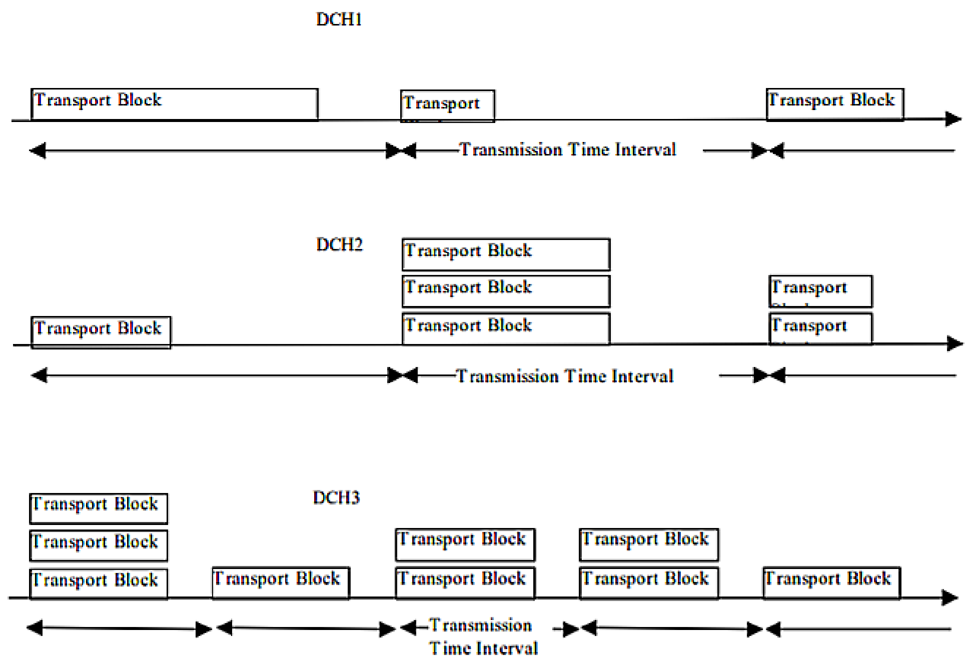


Figure 6: Exchange of data between MAC and L1

Figure 6 of TS 25.302 is a schematic illustration of "an example where Transport Block Sets, at certain time instances, are exchanged between MAC and L1 via three parallel transport channels [DCH1–DCH3]." *Id.* "Each Transport Block Set consists of a number of Transport Blocks," over a transmission time interval or "the time between consecutive deliveries of data between MAC and L1." *Id.*

TS 25.302 defines a transport format as "a format offered by L1 to MAC (and vice versa) for the delivery of a Transport Block Set during a Transmission Time Interval on a Transport Channel." *Id.* at 18. TS 25.302 also defines a number of terms that explain how the MAC layer selects a transport format to deliver a transport block set on a transport channel. First, a transport format set "is defined as the set of Transport Formats associated to a Transport Channel." *Id.* Next, a transport format combination "is defined as an authori[z]ed combination of the combination of currently valid

Transport Formats that can be submitted simultaneously to the layer 1 for transmission on a Coded Composite Transport Channel." *Id.* at 19. Lastly, a transport format combination set "is defined as a set of Transport Format Combinations on a Coded Composite Transport Channel." *Id.* TS 25.302 discloses:

> The Transport Format Combination Set is what is given to MAC for control. However, the assignment of the Transport Format Combination Set is done by L3. When mapping data onto L1, MAC chooses between the different Transport Format Combinations given in the Transport Format Combination Set.

Id.

4. Peisa

Peisa discloses a UMTS network that includes a number of RNCs and a number of UEs, such as mobile terminals. Ex. 1013, 1:66–2:16. "User and signaling data may be carried between an RNC 140 and a UE 110 using Radio Access Bearers (RABs)." *Id.* at 4:28–30. UEs may be "allocated one or more RABs, each of which is capable of carrying a flow of user or signaling data," and is "mapped onto respective logical channels." *Id.* at 4:31–34. A MAC layer includes "a set of logical channels [that are] mapped in turn onto a transport channel." *Id.* at 4:34–36. The transport channels are in turn "mapped at the physical layer onto a [physical channel] for transmission over the air interface." *Id.* at 4:43–47.

Peisa discloses its UMTS layer 2 or MAC protocol layer in Figure 3, which is reproduced below.

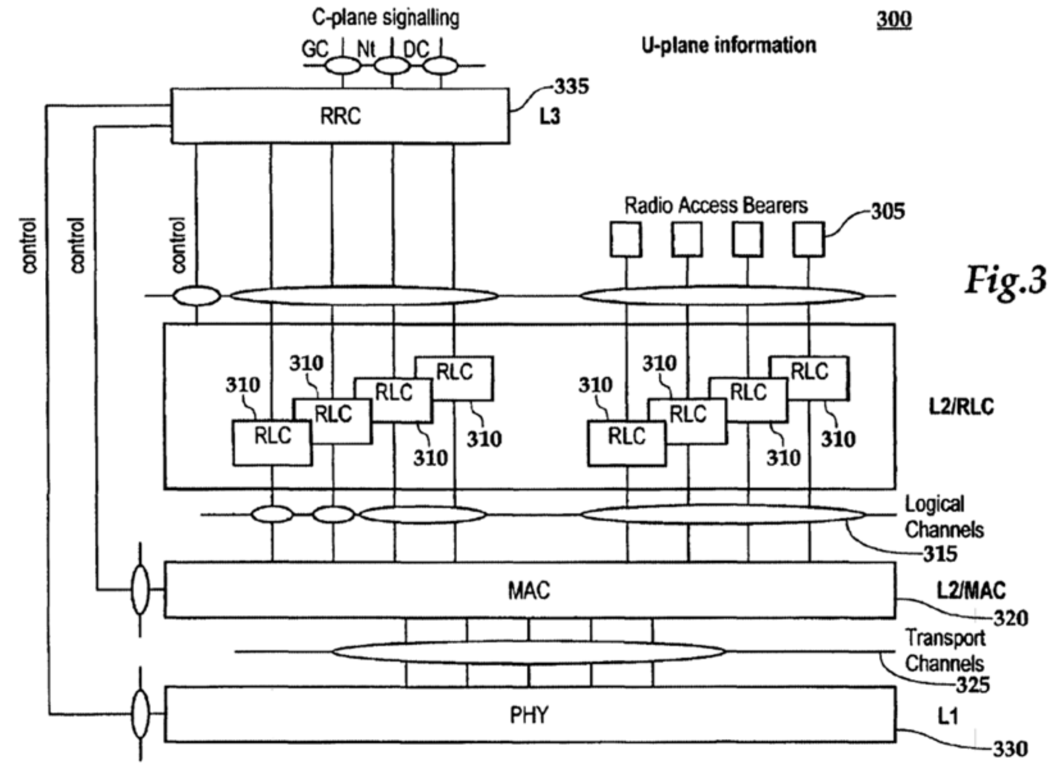


Figure 3 of Peisa "illustrates a simplified UMTS layer 2 protocol structure which is involved in the communication between mobile stations . . . or more broadly UEs 110, and Radio Network Controllers (RNCs) 140." *Id.* at 6:31–37. The protocol structure "includes a set of Radio Access Bearers (RABs) 305 that make available radio resources (and services) to user applications." *Id.* at 6:41–44. Data flowing from RABs 305 "are passed to respective Radio Link Control (RLC) entities 310 . . . [that] buffer the received data," and map RABs 305 "onto respective logical channels 315." *Id.* at 6:45–50. MAC 320 "receives data transmitted in the logical channels 315 and further maps the data from the logical channels 315 onto a set of transport channels 325." *Id.* at 6:50–54. "The transport channels 325 are finally mapped to a single physical transport channel 330, which has a total bandwidth . . . allocated to it by the network." *Id.* at 6:54–57.

Although MAC 320 "performs scheduling of outgoing data packets" buffered by RLC 310, a Radio Resource Controller (RRC) "sets a limit on the maximum amount of data that can be transmitted from each flow by assigning a set of allowed Transport Format Combinations" to MAC 320. *Id.* at 10:19–25. A Transport Format Combination is a set of "all possible TFs [transport formats] for a given transport channel." *Id.* at 7:17–20. RRC 335 defines the set of all possible TFs for a transport channel in terms of TB (Transport Block) sizes and TBS (Transport Block Set) sizes. *Id.* at 7:2–13. The TB size "tells the MAC entity what packet sizes it can use to transport data to the physical layer," and the TBS size tells the MAC entity "the total number of bits [it] can transmit to the physical layer in a single transmission time interval (TTI)." *Id.* at 7:4–11. MAC 320 "independently decide[s] how much data is transmitted from each flow by choosing the best available Transport Format Combination (TFC) from the TFCS." *Id.* at 10:25–28.

Peisa discloses a number of algorithms by which MAC 320 selects the best available TFC from a set of TFCs to schedule data transmissions. For example, Figure 4 is a "method in flowchart form for allocating bandwidth resources to data flow streams between entities in the exemplary second layer architecture of FIG. 3." *Id.* at 3:51–54. Figures 6 and 8 are similarly "method[s] in flowchart form for scheduling data flows." *Id.* at 3:55–57, 3:61–63. Figure 8 of Peisa is reproduced below.

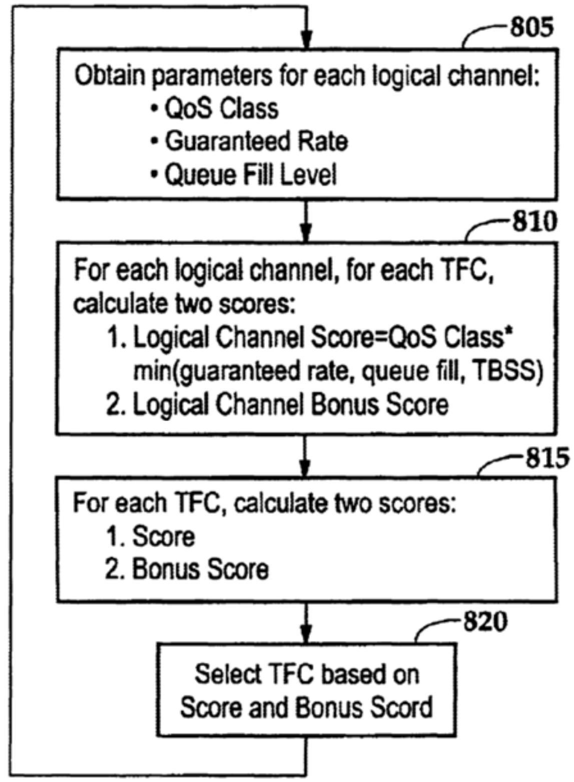


Fig.8

Figure 8 is an illustration of "the scheduling process in the MAC layer [that] includes the selection of a TFC from a TFCS using a two-step scoring process." *Id.* at 18:29–34. At step 805, "several parameters are obtained for each logical channel." *Id.* at 18:35–36, Fig. 8. For example, "[t]he QoS Class for each logical channel may be obtained from the corresponding RAB parameter," and "[t]he Guaranteed Rate for each logical channel may also be obtained from the corresponding RAB parameter." *Id.* at 18:36–43. At step 810, a logical channel score and a logical channel bonus score are calculated for each logical channel. *Id.* at 18:60–67, Fig. 8. At step 815, a score is calculated by summing all of the logical channel scores, and a bonus score is calculated by summing all of the logical channel bonus scores for each TFC in the TFCS. *Id.* at 19:1–6, Fig. 8. At step 820, the MAC selects the TFC with the largest score, or the TFC with the largest bonus score if two or more TFCs have the same score. *Id.* at 19:7–10, Fig. 8. This algorithm "ensures that if there is a TFC that transmits at least the guaranteed rate for each flow, then that TFC is chosen." *Id.* at 19:10–13.

E. Level of Ordinary Skill in the Art

Petitioner does not expressly define the qualifications of a person of ordinary skill in the art in the Petition itself. Rather, Petitioner cites to paragraphs 24 through 26 of the Buehrer Declaration for such a definition. Pet. 15 n.3 (citing Ex. 1002 ¶¶ 24–26). According to Dr. Buehrer, a POSITA would have had "a Bachelor's Degree (or higher degree) in an academic area emphasizing telecommunications systems with two or more years of work experience in telecommunications systems" or would have had "at least a Master of Science Degree in an academic area emphasizing telecommunications systems, or an equivalent field (or a similar technical Master's Degree, or higher degree) with a concentration in telecommunications systems." Ex. 1003 ¶ 25.

Patent Owner does not dispute Dr. Buehrer's definition of the level of ordinary skill in the art, and does not offer an alternative definition. Prelim. Resp. 16. However, Patent Owner argues the Petition should be denied because Petitioner has failed to expressly define the level of skill in the art in the Petition itself or to adopt Dr. Buehrer's definition of such a person. *Id.*

We are not persuaded by Patent Owner's argument. "[T]he level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention." *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Although the Petition does not expressly set forth the level of skill in the art, Petitioner cites to Dr. Buehrer's declaration when first referring to a person of ordinary skill in the art, and Dr. Buehrer sets forth the qualifications of such a person. *See* Pet. 15 (citing Ex. 1002 ¶ 25). Although it is preferable to specify the level of skill in the art in the Petition itself, failure to do so is not necessarily fatal, especially where "the prior art itself reflects an appropriate level and a need for testimony is not shown." *Okajima* 261 F.3d at 1355. As noted above, Patent Owner does not dispute Dr. Buehrer's opinion regarding the level of skill in the art, and does not offer a competing definition.

Accordingly, at this stage of the proceeding, we adopt the definition of a person of ordinary skill in the art set forth in paragraph 25 of the Buehrer declaration, and decline to deny the Petition because Petitioner did not expressly set forth that definition in the Petition itself.

F. Preliminary Challenges to Institution

1. Constitutionality of Inter Partes Review

Patent Owner challenges the Board's jurisdiction to conduct *inter partes* review of the '487 patent because "the Board's appointments of administrative patent judges violate the Appointments Clause of Article II" of the U.S. Constitution. Prelim. Resp. 36. We decline to address the merits of this constitutional challenge because "administrative agencies do not have jurisdiction to decide the constitutionality of congressional enactments." *Riggin v. Office of Senate Fair Employment Practices*, 61 F.3d 1563, 1569 (Fed. Cir. 1995). This is especially true when, as here, "the constitutional claim asks the agency to act contrary to its statutory charter." *Id.*

2. Multiplicity of Challenges

Patent Owner argues we should deny institution because Petitioner "redundantly challenges Claims 11–13 of the '487 Patent without providing any alleged justification for such inefficient redundancies." Prelim. Resp. 17. Patent Owner argues that by presenting redundant grounds, Petitioner is obligated to provide "a bi-directional explanation of the relative strengths and weaknesses of each redundantly offered ground." *Id.* at 19. Because Petitioner did not do so, Patent Owner argues, "the Board need not and should not consider the merits of the redundant challenges" because they "place a significant burden on both the Board and the patent owner, causing unnecessary delay, compounding costs to all parties involved, and compromising the ability to complete review within the statutory deadline." *Id.* at 17, 19.

Although the Board has discretion to deny institution of *inter partes*, we decline to do so based on the facts presented here. The Petition challenges each of claims 11–13 on two separate grounds that rely on Peisa or TS 25.321 as the principal reference. Pet. 4. Under these facts, we disagree that the Petition places undue burden on the Patent Owner or Board, or obligates Petitioner to explain why alternative grounds of obviousness are presented.

Accordingly, on this record we decline to exercise our discretion to deny institution of *inter partes* review.

3. Reliance on Previously Considered Prior Art

The Director has discretion to institute *inter partes* review, and has delegated that discretion to the Board. *See* 35 U.S.C. § 314(a); *see also* 37 C.F.R. §42.4(a). The Board may consider and weigh several factors when considering whether to institute *inter partes* review, including those set forth in 35 U.S.C. § 325(d). *See Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, *slip op.* at 18–19 (PTAB Sept. 6, 2017) (Paper 19) (precedential). Under 35 U.S.C. § 325(d), the Director may "reject [a] petition . . . because [] the same or substantially the same prior art or arguments previously were presented to the Office."

Petitioner challenges claims 11–13 as obvious over Peisa. Pet. 4. During prosecution of the application that issued as the '487 patent the Examiner rejected pending claims 11–13 as anticipated by Peisa. Ex. 1004, 33, 35–36. Pending claims 11–13 recited a selection algorithm for selecting a transport format combination, and required the selection to be "carried out while maintaining a minimum bit rate obtaining for [a] respective logic channel." *Id.* at 79–80. The Examiner cited Peisa at column 9, lines 15–19 and column 10, lines 1–12 for disclosing this limitation, finding "the claimed minimum bit rate is inherent in the transport format combination." *Id.* at 35–36.

In response, the applicant disagreed that "the claimed minimum bit rate is inherent in the transport format combinations," and argued that the cited portions of Peisa instead teach "how the Peisa system accounts for a backlog situation." *Id.* at 29. The applicant also amended claim 13 to require "the selection algorithm uses a minimum bit rate criteria applicable to the respective logic channel," and argued that "Peisa *does not teach* to use a minimum bit rate criteria as a factor in the selection of the TFC as recited in the amended claims." *Id.* at 26–27, 29 (emphasis added). The Examiner accepted these arguments, and allowed amended claim 13 to issue, finding "the prior art of record does not teach wherein the selection algorithm uses a minimum bit rate criteria applicable to the respective logic channel." *Id.* at 10–12.

Petitioner acknowledges this prosecution history, but argues "different portions of Peisa are considered in this Petition, which, in combination with other references, clearly render the '487 Patent claims obvious." Pet. 19. Petitioner further argues that the prosecution history "does not indicate that the Examiner considered the portions of Peisa cited in this Petition, which are more relevant to the purportedly novel features of the '487 patent than that cited and considered during original prosecution." *Id.*

Patent Owner argues we should deny the Petition because "Petitioner provides no reasonable justification to second-guess the Examiner," and has cited no evidence "that the Examiner didn't consider other portions of Peisa that [Petitioner] now cites." Prelim. Resp. 29–30. Patent Owner further argues that the prosecution history "indicates that the Examiner affirmatively did consider Peisa <u>in its entirety</u>" because the Examiner's rejection of pending claims 11–13 cited "six of the seventeen columns of Peisa's detailed description." *Id.* at 30–31. Patent Owner, therefore, argues the first three *Becton Dickinson*[5] factors weigh against granting the Petition. *Id.* at 32.

In *Becton Dickinson*, the Board identified six *non-exclusive* factors that are considered when deciding whether to exercise discretion to deny review under 35 U.S.C. § 325(d). These are: (a) the similarities and material differences between the currently and previously asserted prior art; (b) the cumulative nature of the currently asserted prior art; (c) the extent to which

[5] *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, Case IPR2017-01586, slip op. at 17–18 (PTAB Dec. 15, 2017) (Paper 8) (informative). We note that the Becton Dickinson factors were adopted and applied in *NHK Spring Co. v. Intri-Plex Techs., Inc.*, Case IPR2018-00752, slip op. at 11–12 (PTAB Sept. 12, 2018) (Paper 8) (precedential).

the currently asserted prior art was previously considered, and whether it was the basis for a previous challenge to the same or similar claim; (d) the extent to which arguments, currently and previously made to challenge or defend the claims, overlap; (e) the extent to which Petitioner has shown error in the previous consideration of the prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments previously made. *Becton Dickinson*, slip op. at 17–18.

Under the facts presented here, we are not persuaded that we should deny review under 35 U.S.C. § 325(d). Although we agree with Patent Owner that the first three *Becton Dickinson* factors weigh in favor of denying review, the last three factors weigh in favor of considering Petitioner's challenge based on portions of Peisa that were not previously considered.

During prosecution, the Examiner cited Peisa at column 9, lines 15–19, and column 10, lines 1–12, for teaching selecting a TFC while maintaining a minimum bit rate applicable to a respective logic channel. Ex. 1004, 35–36. These portions of Peisa disclose selecting a TFC based on a bandwidth share computed for the input flows, adding any differences between the computed bandwidth share and the transmission rates allocated by the selected TFC to backlog counters, and "tak[ing] into account the value of the backlog counters when selecting a TFC for the subsequent frame of the output data flow." Ex. 1013, 9: 13–24, 9:66–10:12. The portions of Peisa cited by the Examiner do not disclose how bandwidth share is computed, and do not disclose that the bandwidth share computation provides a guaranteed minimum bit rate for each input flow. *Id.* The applicant correctly identified this defect in the Examiner's rejection of pending claims 11–13 over Peisa, and on this basis argued that "Peisa does not teach to use a minimum bit rate criteria as a factor in the selection of the TFC." Ex. 1004, 29. The Examiner accepted this argument and allowed pending claims 11 and 12, and amended claim 13 to issue. *Id.* at 11–12.

Notably, Petitioner does not rely on any of the disclosures in Peisa cited by the Examiner for teaching selecting a TFC using a minimum bit rate criteria applicable to a respective logical channel. *See* Pet. 59–61, 69. Rather, Petitioner cites to numerous other portions of Peisa for teaching this limitation. *Id.* (citing, Ex. 1013, 2:43–3:36, 11:43–49, 18:3–18, 18:29–57, 18:60–19:13, Fig. 8). The portions of Peisa cited by Petitioner were not cited by the Examiner, and are germane to the claimed TFC selection algorithm that uses a minimum bit rate criteria. *See* Ex. 1004, 35–36; *see also* Ex. 1013, 2:44–46 (disclosing "a two-level scheduling mechanism . . . to maintain guaranteed bit rates to the extent practicable"), 2:57–58 (disclosing "the TFC is selected based on guaranteed rate transmission rates"), 2:64–65 (disclosing "selecting a TFC based on guaranteed rate transmission rates"), 3:3–11 (disclosing "calculating a first transfer rate for multiple flows . . . [and] assigning bandwidth to each flow of the multiple flows responsive to the first transfer rate . . . . [where] the first transfer rate may correspond to a guaranteed rate transfer rate"), 11:47–49 (disclosing scheduling packets "by optimizing the throughput while still keeping the fairness (i.e., guaranteed rates)"), 18:3–4 (disclosing "guaranteeing (e.g., different) guaranteed bit rates to services having different, QoS classes"), 18:13–15 (disclosing a "two-level scheduling process [that] guarantees that . . . all flows receive their guaranteed bit rates"), 18:41–43 (disclosing obtaining a "Guaranteed Rate for each logical channel"), 19:10–13, Fig.8 (disclosing the selection algorithm of Figure 8 "ensures that if there is a TFC that transmits at least the guaranteed rate for each flow, then that TFC is chosen").

The prosecution history does not indicate that the Examiner considered these disclosures in Peisa, or that the applicant argued that these disclosures do not teach selecting a TFC using a minimum bit rate criteria. *See* Ex. 1004, 28–30, 33–36. These factors, together with the relevance the disclosures in Peisa cited by Petitioner have to the claimed TFC selection algorithm, warrant reconsideration of Peisa and the arguments previously made both for and against the patentability of claims 11–13 over Peisa.

4. Public Availability of 3GPP references

Petitioner challenges claims 11–13 as obvious over TS 25.321, TS 25.302, and R2-010182, all of which are 3GPP references. Pet. 4, 9, 12, 16. Petitioner argues R2-010182 is a printed publication because it was "discussed during meeting #18 of the working group (WG2) of 3GPP TSG RAN, held on January 15–19, 2001, and was publically available on the 3GPP file server no later than January 23, 2001." *Id.* at 12 (citing Ex. 1006 §§ IV, VII; *Nokia Sols. v. Huawei Techs. Co.*, IPR2017-00660, slip op. at 11–14 (PTAB July 28, 2017) (Paper 8).

According to Mr. Bishop, R2-010182 (Ex. 1008) is a true and correct copy of a Microsoft Word document uploaded to the 3GPP FTP (File Transfer Protocol) server on January 23, 2001, in the compressed file R2-010182.zip. Ex. 1006 ¶ 35. Moreover, it was the customary practice of 3GPP to make any document uploaded to its FTP server available to any member of the public without restriction. *Id.* ¶¶ 22–26, 35. Mr. Bishop further testifies that a version of R2-010182, differing in editorial but not technical content, was emailed to participants of 3GPP RAN WG2 on January 11, 2001, prior to meeting #18. *Id.* ¶¶ 27–30, 36–40. This meeting was attended by 95 individuals, and R2-010182 was discussed at the meeting. *Id.* ¶ 41 (citing App. H, 94–95). Moreover, it was the customary practice of 3GPP that no restrictions were placed on how "meeting participants dispose of the documents" distributed by email prior to a working group meeting. *Id.* ¶ 40 (citing App. B, 56, 60).

Patent Owner does not argue that Mr. Bishop's testimonial evidence is insufficient to support a finding of public accessibility of R2-010182. Rather, Patent Owner argues that "the Petition has failed to meet its burden of explaining why R2-010182 qualifies as prior art" because the "Petition does not recite any applicable standard that R2-010182 must meet to qualify as some type of prior art . . . or explain how the supporting evidence allegedly demonstrates that the document qualifies as prior art." Prelim. Resp. 22. Patent Owner, therefore, argues that the Petition "fails the minimum standards required to explain the significance of evidence, both under 37 C.F.R. § 42.22(a)" and previous Board decisions. *Id.*

Rule 42.22(a) requires a petition to set forth "[a] full statement of the relief requested, including a detailed explanation of the significance of the evidence . . . and the governing law, rules, and precedent." 37 C.F.R. § 42.22(a). Patent Owner argues a "blanket citation to a portion of a declaration, with no explanation as to how the facts set forth in the . . . declaration" meet the standard set forth in Rule 42.22(a) means that Petitioner has failed to show "that it is more likely than not that R2-010182 qualifies as prior art." Prelim. Resp. 24 (citing *DynaEnergetics US, Inc. v.*

GEODynamics, Inc., PGR2018-00065, slip op. at 14–19 (PTAB Nov. 15, 2018) (Paper 8)[6]). Patent Owner similarly argues that a failure "to provide an analysis of the evidence contained in the Bishop Declaration in the first instance" means that Petitioner "has failed to meets its burden to show that the proffered [R2-010182] document constitutes prior art." *Id.* at 25 (citing *Spalding v. Hartsell*, Patent Interference No.104,699, slip op. at 5, 9 (BPAI 2002) (Paper 92) (informative)).

The question of whether a reference "qualifies as a 'printed publication' under § 102 is a legal conclusion based on underlying factual determinations." *Kyocera Wireless Corp. v. Int'l Trade Comm'n,* 545 F.3d 1340, 1350 (Fed. Cir. 2008). Public accessibility is "the touchstone in determining whether a reference constitutes a 'printed publication.'" *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986). It "is determined on a case-by-case basis, and based on the 'facts and circumstances surrounding the reference's disclosure to members of the public.'" *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009) (quoting *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)). "[A] variety of factors may be useful in determining whether a reference was publicly accessible." *Id.* at 1312. One such factor is whether a party intended to make the reference public. *See In re Wyer*, 655 F.2d 221, 227 (CCPA 1981). Other factors include the length of time the reference was displayed, the expertise of the audience to which it was displayed, whether the displaying party had a reasonable expectation that the reference would not be copied, efforts made to prevent copying, and the ease

[6] Patent Owner mistakenly cites to the Decision at pages 25–28. The discussion of the public accessibility of the reference in question, however, occurs at pages 14–19.

or simplicity with which the reference could have been copied. *Klopfenstein*, 380 F.3d at 1350–51. “Evidence of routine business practice can be sufficient to prove that a reference was made [publicly] accessible.” *Constant v. Advanced Micro-Devices, Inc*., 848 F.2d 1560, 1568–69 (Fed. Cir. 1988).

As noted above, Petitioner contends that R2-010182 is a printed publication because it was discussed during the January, 2001, 3GPP TSG RAN WG2 meeting, and was made publically available on the 3GPP file server by January 23, 2001, and cites the Bishop Declaration as evidence supporting these contentions. Pet. 12 (citing Ex. 1006 §§ IV, VII). Mr. Bishop testifies that R2-010182 was uploaded to the 3GPP FTP server without restriction on January 23, 2001, and was available for downloading (copying) from that server by interested parties after that date. Ex. 1006 ¶ 35; *see also id.* ¶¶ 22–26. Moreover, Mr. Bishop testifies the document was emailed without restriction on January 11, 2001, to participants of 3GPP RAN WG2 meeting #18, and that the document was discussed at that meeting, which was attended by 95 individuals. *Id.* ¶¶ 36–41 (citing App. H, 94–95); *see also id*. ¶¶ 27–30. Patent Owner does not dispute the veracity of Mr. Bishop’s testimony. *See* Prelim. Resp. 21–25. Therefore, at this stage of the proceeding and accepting Mr. Bishop’s testimony as true, we determine Petitioner has demonstrated a reasonable likelihood of showing R2-010182 is a printed publication.

The Board’s decisions in *DynaEnergetics* and *Spalding*, relied on by Patent Owner, do not compel reaching a different conclusion. First, neither case is precedential, although *Spalding* is informative. Second, in several important aspects, the facts presented in *DynaEnergetics and Spalding* are distinguishable from the facts presented here. The *DynaEnergetics* petition sought to establish the public accessibility of lecture notes distributed at a workshop held at the Fraunhofer Institute in Germany. PGR2018-00065, Paper 8, slip op. at 14. The lecture notes and declaration of the distributing author were written in German, and although translations were provided, no affidavit attested to the accuracy of the translations. *Id.* at 15. The *DynaEnergetics* petition cited only two paragraphs of the distributing author's declaration to support public accessibility of the lecture notes, and those paragraphs simply identified the author and stated his conclusion that the lecture notes were publically available. *Id.* at 17& n.8. Moreover, the patent owner contested whether the attendees of the workshop—members of the military industry—were persons interested and ordinarily skilled in the relevant oil and gas industry. *Id.* at 16. By contrast, in the instant case, Petitioner makes factual allegations, supported by Mr. Bishop's testimony, that R2-010182 was made publically available by uploading it to a 3GPP server from which it could be downloaded without restriction by interested members of the wireless telecommunications industry.

In *Spalding*, the motion seeking to establish the public availability of a paper simply stated that the author "distributed his paper 'widely and publicly' to individuals, organizations, and companies interested in [its subject matter]," without explaining how the paper was widely and publicly distributed. Patent Interference No.104,699, Paper 92, slip op. at 4. Although the movant in *Spalding* cited four declarations in support of its assertion that the paper was widely and publicly distributed, the citations were "to entire exhibits as a whole, and not to any particular section or paragraph," and were used "to support the ultimate conclusion rather any particular underlying fact." *Id.* at 4–5. By contrast, in the instant case, Petitioner cites to specific sections of Mr. Bishop's declaration to support Petitioner's factual contention that R2-010182 was made publically accessible by uploading the document to a 3GPP server from which it could be downloaded without restriction by interested members of the wireless telecommunications industry.

Accordingly, for the reasons discussed above, unlike the petitioner in *DynaEnergetics* or the junior party in *Spalding*, Petitioner has demonstrated a reasonable likelihood of showing R2-010182 is a printed publication.

G. Patentability of claims 11–13 over TS25.321, R2-010182, and TS25.302

Petitioner argues claims 11–13 are unpatentable as obvious over the combination of TS 25.321, R2-010182, and TS 25.302. Pet. 22–45. As discussed in § II.C, *supra*, claims 11–13 are independent claims, and respectively recite a radio network controller, a terminal, and a method of controlling a network having the properties and functionality of the network recited in claim 1. *Compare id.* at 16:26–65, *with id*. at 14:40–50. Petitioner's analysis largely focuses on demonstrating how the combination of TS 25.321, R2-010182, and TS 25.302 teaches or suggests the limitations of claim 13, a method of controlling a network having the functionality of the network of claim 1, but provides additional disclosure indicating how the network of claim 1 includes a radio network controller and a terminal having similar network functionality as required by independent claims 11 and 12. We largely follow Petitioner's analysis below.

Petitioner argues a person of ordinary skill in the art would have combined the teachings of TS 25.302 and TS 25.321 because they "describe features and functions of adjacent layers of the UMTS network architecture—TS25.321 describes the MAC protocol specification while TS25.302 describes the services provided by the physical layer, which is below the MAC layer and provides services to the MAC layer." *Id.* at 17 (citing Ex. 1002 ¶ 92). Petitioner further argues that "TS25.321 relies on several features corresponding to the physical layer, such as transport channels, transport format, and TFCs, which are defined in TS25.302," and cites to TS25.302 for "contain[ing] provisions which, through reference in . . . text, constitute provisions of the present [TS25.321]" document. *Id.* at 17–19 (quoting Ex. 1007 § 2). Relying on the testimony of Dr. Buehrer, Petitioner argues that a person of ordinary skill in the art looking "to fully understand the specification of the MAC layer protocol in TS25.321, or to obtain a comprehensive view of the UMTS network, or both" would have "look[ed] at the two references together, combining their teachings." *Id.* at 18 (citing Ex. 1002 ¶¶ 101, 103).

Petitioner further argues that a person of ordinary skill in the art would have combined TS 25.321 and R2-010183 because the latter "explicitly notes that it is a change request (CR) for TS25.321," and marks proposed changes to the TFC selection algorithm in § 11.4 of TS 25.321. *Id.* at 15 (citing Ex. 1008, 4–5). Relying on the testimony of Dr. Buehrer, Petitioner argues that a person of ordinary skill in the art "with knowledge of TS25.321 and considering possible limitations to its contents, such as the TFC selection algorithm, would have looked to routine 3GPP contributions (and change requests) like R2-010182," and would have considered the teachings of R2-010182 "in the context of TS25.321." *Id.* at 15–16 (citing Ex. 1002 ¶¶ 86–87).

At this stage of the proceeding, we find Petitioner has sufficiently demonstrated a reason to combine the teachings of TS 25.321, TS 25.302, and R2-010182. We note that Patent Owner does not contest Petitioner's reasoning to combine the teachings of these references. Prelim. Resp. 18–33.

1. Claim 13

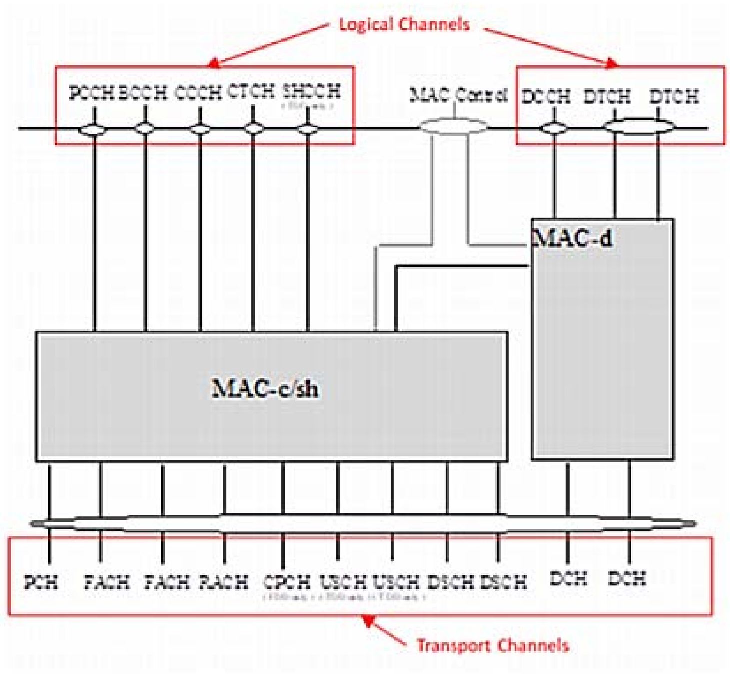
Claim 13 recites a method of controlling a network with a first plurality of logic channels associated with a second plurality of transport channels. Ex. 1001, 16:54–56.

Petitioner identifies the title of TS 25.321 as a technical specification for the MAC protocol for "radio access networks." Pet. 23. Petitioner demonstrates where TS 35.321 discloses "the 'traffic related architecture' of the MAC entities (e.g., MAC-c/sh and MAC-d) of the 'UE,'" and also "the 'traffic related architecture' of the MAC entities for the UTRAN side of the network, which are 'located in the controlling RNC' and 'in the serving RNC.'" *Id.* (quoting Ex. 1007 §§ 3.2, 4.1, 4.2.3, 4.2.4).

Petitioner further demonstrates where TS 25.321 discloses how the UE MAC entities control various network functions, such as "access to common transport channels," "access to dedicated transport channels," "mapping between logical and transport channels," "scheduling / priority handling . . . to transmit the information received from MAC-d on RACH and CPCH based on logical channel priorities," and "transport format and transport format combination selection according to the transport format combination set . . . configured by RRC." *Id.* at 24 (quoting Ex. 1007 §§ 4.2.3, 4.2.3.1, 4.2.3.2; citing *id.* Figs. 4.2.3.1.1, 4.2.3.2.1) (emphasis omitted). Relying on the testimony of Dr. Buehrer, Petitioner argues a person skilled in the art would have found it obvious in view of these disclosures that "the MAC[s] of the UEs in the UMTS network perform functions directed towards controlling various aspects of the MAC layer of the UMTS network." *Id.* at 25 (citing Ex. 1002 ¶ 182).

Petitioner also demonstrates where TS 25.321 discloses how the RNC MAC entities on the UTRAN side of the network control various network functions, such as "Scheduling – Priority handling . . . [to] manage[] FACH and DSCH resources between the UEs and between data flows according to their priority," "mapping between logical and transport channels," and "TFC selection [] in the downlink." *Id.* at 25–26 (quoting Ex. 1007 §§ 4.2.4.1; citing *id*. at § 4.2.4.2, Figs. 4.2.4.1.1, 4.2.4.2.1) (emphasis omitted). Relying on the testimony of Dr. Buehrer, Petitioner argues a person skilled in the art would have found it obvious in view of these disclosures that "the MAC of the RNCs in the UMTS network performs functions directed towards controlling various aspects of the MAC layer of the UMTS network." *Id.* at 26–27 (citing Ex. 1002 ¶¶ 183–184).

Petitioner further demonstrates where TS 25.321 discloses the MAC layer functionality includes "mapping between logical channels and transport channel." *Id.* at 27 (citing Ex. 1007 § 6.1). Petitioner identifies Figure 4.2.3.1 of TS 25.321 as showing how a plurality of logic channels are mapped to a plurality of transport channels. Pet. 27–28. Petitioner argues the figure shows "specific connections between particular logic channels (e.g., PCCH, CCCH, DCCH) and particular transport channels (e.g., FACH, PCH, RACH)." *Id.* at 28 (citing Ex. 1007 §§ 4.3–4.3.3). Petitioner's annotated version of Figure 4.2.3.1 is reproduced below.



TS25.321 FIG. 4.2.3.1 (annotated)

Figure 4.2.3.1 is a Petitioner-annotated version of the same figure shown in section 4.2.3 of TS 25.321. Pet. 28. TS 25.321 discloses that RACH (random access channel), FACH (forward access channel), and PCH (paging channel) are transport channels, and that PCCH (paging control channel), CCCH (common control channel), and DCCH (dedicated control channel) are logical channels. Ex. 1007 §§ 4.3.1, 4.3.2.1. It further discloses the following logical/transport channel mappings: PCCH is mapped to PCH, CCCH is mapped to RACH and FACH, and DCCH is mapped to RACH and FACH. *Id.* at § 4.3.3. Although the Figure demonstrates the mapping of logical channels to transport channels on the UE side of the network, Petitioner also demonstrates how TS 25.321 shows the same MAC layer mappings on the RNC side of the network. Pet. 28 (quoting Ex. 1007 § 4.2.4.1; citing Ex. 1002 ¶ 187).

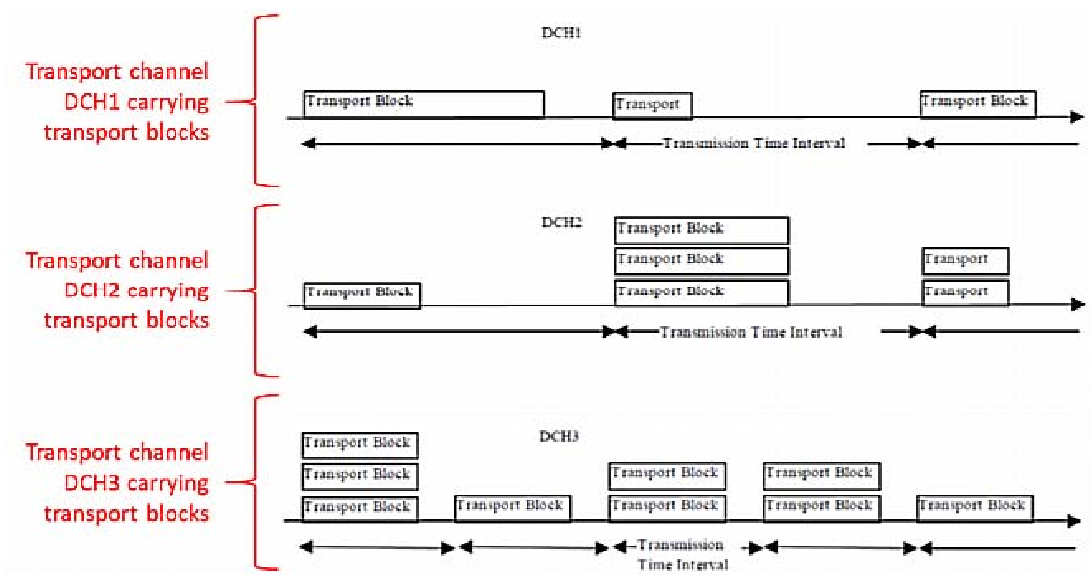
Patent Owner does not challenge these contentions. *See* Prelim. Resp. 19–33.

Claim 13 further recites the transport channels are provided for transmitting blocks formed from packet units of the logic channels. Ex. 1001, 16:56–58. Petitioner identifies where TS 25.321 teaches MAC functions include "multiplexing/demultiplexing of higher layer PDUs into/from transport blocks delivered to/from the physical layer" on both common and dedicated transport channels. Pet. 29 (citing Ex. 1007 § 6.1) (emphasis omitted). Relying on the testimony of Dr. Buehrer, Petitioner argues that PDUs are Protocol Data Units, and a person skilled in the art would have understand PDUs to be "packet units of higher layers." *Id.* (citing Ex. 1007 § 3.2; Ex. 1002 ¶ 189) (emphasis omitted). Petitioner further identifies where TS 25.321 teaches that "logical channels are[] between MAC and RLC," and the RLC layer "provides RLC-PDUs to the MAC, which fit into the available transport blocks on the transport channels." *Id.* at 29–30 (citing Ex. 1007 §§ 4.2.3.1, 4.3). Patent Owner does not challenge these contentions. *See* Prelim. Resp. 19–33.

Claim 13 further recites a plurality of valid transport format combinations allocated to the transport channels that indicate the transport blocks provided for transmission on each transport channel. Ex. 1001, 16:58–61. Petitioner identifies where TS 25.302 teaches a Transport Format Combination Set that "need not contain all possible Transport Format Combinations that can be formed by Transport Format Sets of the corresponding Transport Channels." Pet. 31 (quoting Ex. 1009 § 7.1.9). Rather, "[i]t is only the allowed combinations that are included." *Id.* (emphasis omitted). Petitioner further identifies where TS 25.302 defines a

Transport Format in a Transport Format Set as "a format offered by L1 (i.e., the physical layer) to MAC (and vice versa) 'for the delivery of a Transport Block Set [] on a Transport Channel'" whose attributes include Transport Block Size and Transport Block Set Size. *Id.* at 32 (quoting Ex. 1009 § 7.1.6) (emphasis omitted). The Transport Block Set is "a set of Transport Blocks, which are exchanged between L1 and MAC . . . using the same transport channel." *Id.* at 33 (quoting Ex. 1009 § 7.1.2) (emphasis omitted). The Transport Block Size is "the number of bits in a Transport Block," and the Transport Block Set Size is "the number of bits in a Transport Block Set." *Id.* (quoting Ex. 1009 §§ 7.1.3, 7.1.4) (emphasis omitted).

Petitioner further demonstrates where TS 25.302 illustrates the meaning of these terms in an annotated version of Figure 6, which is reproduced below.



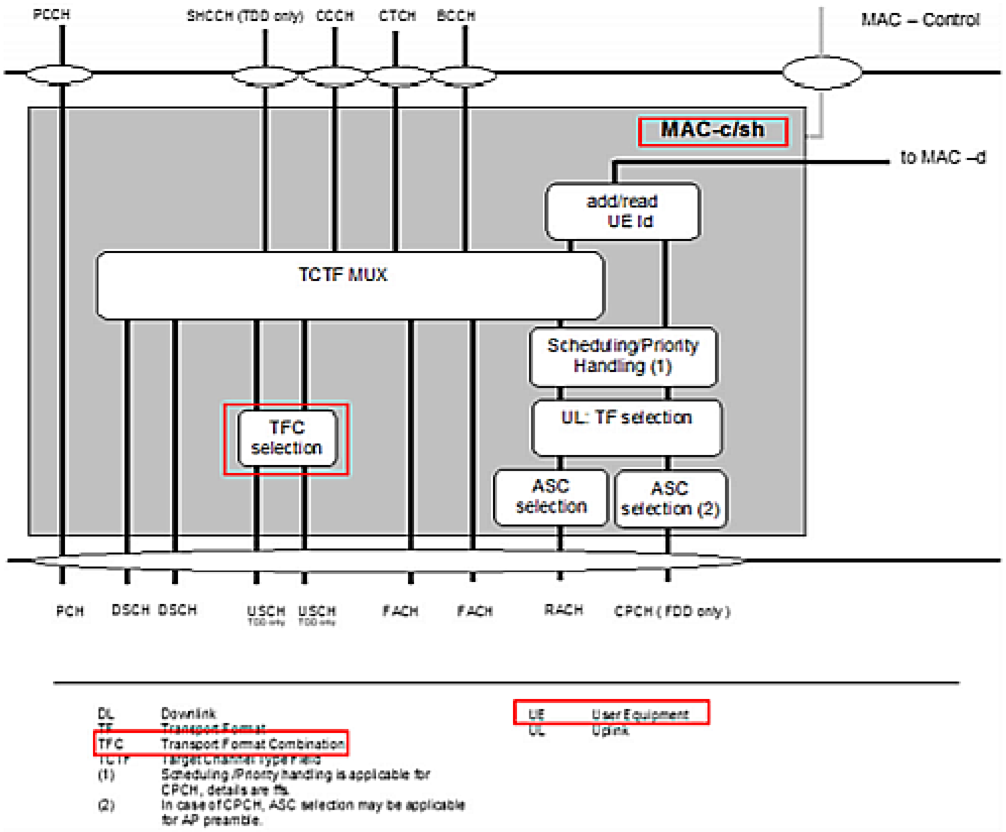
TS25.302, FIG. 6 (annotated)

Figure 6 is a Petitioner-annotated version of Figure 6 of TS 25.302. *Id.* Annotated Figure 6 is an example showing how different Transport Block

Sets are exchanged on different Transport Channels (DCH1–DCH3) at different times, where each Transport Block Set contains one or more Transport Blocks. Ex. 1009 § 7.1.5. Petitioner argues annotated Figure 6 shows how "Transport Block Sets . . . are exchanged between MAC and L1 via three parallel transport channels," where "[e]ach Transport Block Set consists of a number of Transport Blocks." Pet. 33 (quoting Ex. 1009 § 7.1.5) (emphasis omitted). Relying on the testimony of Dr. Buehrer, Petitioner argues a person skilled in the art would have understood that a "transport format for a transport channel provides information on the transport blocks for that channel," and that "transport format combination[s], by including transport formats for transport channels, indicate the transport blocks provided for transmission on the corresponding transport channels." *Id.* at 34 (citing Ex. 1002 ¶¶ 199–201).

Claim 13 further recites a selection algorithm for selecting the transport format combinations, wherein the selection algorithm uses a minimum bit rate criteria applicable to the respective logic channel. Ex. 1001, 16:61–65. Petitioner demonstrates where TS 25.321 teaches the MAC layer performs TFC selection or "transport format and transport format combination selection according to the transport format combination set . . . configured by the RRC." *Id.* at 34 (quoting Ex. 1007 § 4.2.3.1) (emphasis omitted). This is shown, for example, in Petitioner's annotation of Figure

4.2.3.1.1 of TS 25.321, which is reproduced below.



TS25.321, FIG. 4.2.3.1.1 (annotated)

Annotated Figure 4.2.3.1.1 is Petitioner's annotation of Figure 4.2.3.1.1 of TS 25.321 showing TFC selection by MAC-c/sh. *Id.* at 35. Petitioner further demonstrates where TS 25.321 teaches its TFC selection algorithm is based on the absolute priorities of logical channels, where each logical channel is assigned a priority value between 1 and 8. *Id.* at 35–36 (citing Ex. 1007 § 11.4; Ex. 1002 ¶ 204). Although the algorithm shown in Figure 4.2.3.1.1 is for TFC selection by the UE, Petitioner demonstrates where TS 25.321 also teaches the RNC MAC includes a TFC selection algorithm. *Id.* at 36 (quoting Ex. 1007 § 4.2.4.1; citing Ex. 1002 ¶¶ 183–184, 205–206).

Petitioner further demonstrates where R2-010182 proposes a modification to the TFC selection algorithm in TS 25.321 by adding "new parameters given by the network to UE for MAC TFC selection," including a minimum guaranteed bit rate (MinGBr) parameter. *Id.* at 37 (quoting Ex. 1008, 1) (emphasis omitted). The modified TFC selection algorithm tries "to reach the MinGBr for each logical channel in the descending order of priority." *Id.* (quoting Ex. 1008, 2) (emphasis omitted). In the proposed modified TFC selection algorithm, "[l]ogical channels have relative priorities i.e. the UE shall allocate the Minimum guaranteed bit rate to each logical channel." *Id.* at 37–38 (quoting Ex. 1008, 5). Petitioner equates the MinGBr parameter in the proposed modified TFC selection algorithm with the "minimum bit rate criteria" required by claim 1 because MinGBr represents "the basic [(e.g., minimum)] needs of the logical channel." *Id.* at 38 (quoting Ex. 1008, 2).

Relying on the testimony of Dr. Buehrer, Petitioner argues a person skilled in the art would have known that "the TFC selection algorithm of TS 25.321 could be modified to consider the minimum bit rate criteria (MinGBr) of the logical channels, e.g., to 'solve the problems encountered in the absolute priority scheme'" used in TS 25.321's TFC selection algorithm, including the problem involving "the starvation of logical channels of lower priority from transmitting due to TS 25.321's absolute priority scheme." *Id.* (citing Ex. 1002 ¶¶ 209–210).

Patent Owner argues that because claim 1[7] recites a minimum bit rate criteria applicable to respective logic channels, "the minimum bit rate

[7] Although Patent Owner's argument refers to claim 1, which is not

criteria is not uniform for all logic channels," and "different minimum bit rate criteria are applicable to the different logic channels." Prelim. Resp. 25–26. Patent Owner further argues that this interpretation is supported by the '487 patent, which explains that "the minimum bit rate is often defined by the relevant application," and that "different applications may require different minimum bit rate criteria." *Id.* at 26 (citing Ex. 1001, 1:65–2:1).

To the extent Patent Owner's interpretation of "a minimum bit rate criteria applicable to the respective logic channel" requires each logic channel to have a *different* minimum bit rate, we disagree with that interpretation. Although the '487 patent discloses that "different applications *may* require different minimum bit rates," it does not disclose that different applications *must* have different minimum bit rates. *See* Ex. 1001, 1:65–2:1. Thus, although claim 1 requires each logical channel to have its own *respective* minimum bit rate that does not imply or require that the minimum bit rate for every logical channel must be *different* from the minimum bit rate for every other logical channel. For example, logical channels *a*, *b*, and *c* can have *respective* minimum bit rates of (1) 100, 150, and 200, (2) 100, 100, and 200, or (3) 100, 100, and 100. In each case, logical channels *a*, *b*, and *c* have their own *respective* minimum bit rates, even though some or all of the logical channels *may* have the *same* minimum bit rate. In other words, claim 1 does not require the minimum bit rate for

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challenged in this Petition, we interpret the argument to refer to independent claims 11–13, which are challenged. Claims 11 and 12 recite "taking into account a minimum bit rate obtaining for [a] respective logic channel." Ex. 1001, 16:39–40, 16:52–53. Claim 13, like claim 1, recites using "a minimum bit rate criteria applicable to [a] respective logic channel." 16:64–65.

each logical channel to differ from the minimum bit rate for any or every other logical channel; it simply requires each logical channel to have its own or *respective* minimum bit rate that is independent of, though not necessary different from, the respective minimum bit rates for the other logical channels.

Patent Owner argues that Petitioner has failed to show the unpatentability of claim 1[8] because R2-010182 makes "clear that there is only a single Min guaranteed bit rate, and not separate minimum guaranteed bit rates depending on the logical channel." Prelim. Resp. 27. Patent Owner argues "[t]he value of MinGBr is nowhere identified as being dependent on a variable, such as the identification of a logical channel." *Id.* For example, Patent Owner points to a table in R2-010182 that shows the "properties of two logical channels, LC1 and LC2, including minimum bit rate," and argues that "[w]hile other properties of the respective logical channels differ, the minimum bit rate is given as identical for both, with a value of 100 bits/time window." *Id.* at 28 (citing Ex. 1008, 2).

At this stage of the proceedings, we are not persuaded by Patent Owner's arguments. TS 25.321 teaches assigning the parameter MLP on a logical channel basis to represent each logical channel's respective priority. *See* Ex. 1007 § 11.2.1 (disclosing "*each* involved logical channel is assigned a MAC Logical channel Priority (MLP) in the range 1……8.") (emphasis added). R2-010182 proposes modifying the MLP-based TFC selection algorithm disclosed in TS 25.321 by introducing minimum guaranteed bit rate (MinGBr), maximum guaranteed bit rate (MaxBr), and time window

[8] *See* n.7, *supra*.

(TW) parameters to "*complete the current MLP for representing Logical channel priorities*." Ex. 1008, 1 (emphasis added).

R2-010182 defines each of these new parameters, like the MLP parameter itself, in terms of logical channels: TW represents "the time period on which the allocated bit rate for *the logical channel* is estimated;" MinGBr represents "the basic needs of the *logical channel;*" and MaxBr represents "the nominal needs of the *logical channel*." *Id.* at 2 (emphasis added). R2-010182 further discloses the new parameters are needed because "MLP is not enough to implement a relative priority scheme," and the new parameters "complet[e] MLP to express accurately the *needs of different applications* in terms of bit rate." *Id.* (emphasis added). R2-010182 further indicates that the new parameters are introduced "to *characterise* [sic] *MAC logical channels* for TFC selection." *Id.* at 4 (emphasis added).

For the reasons discussed above, at this stage of the proceedings, we find R2-010182 teaches the MinGBr is independently assigned to respective logical channels. This is shown, for example, in the Table on page 2 of R2-010182, which is reproduced below.

	LC1	LC2
MLP	**1**	**2**
TW(TTI)	**3**	**4**
MinGBr	**100**	**100**
MaxBr	**200**	**200**

The Table shows example values assigned to the TFC selection algorithm parameters proposed in R2-010182 for two logical channels, LC1 and LC2. Ex. 1008, 2. Logical channel LC1 is assigned a priority (MLP) of 1, a minimum guaranteed bit rate (MinGBr) of 100 bits/TW measured over a time window (TW) of 3 TTI, and a maximum bit rate (MaxBr) of 200 bits/TW measured over the 3 TTI time window. *Id.* Logical channel LC2 is assigned an MLP of 2, a MinGBr of 100 bits/TW measured over a TW of 4 TTI, and a MaxBr of 200 bits/TW measured over the 4 TTI time window. *Id.*

Although logical channels LC1 and LC2 have the same minimum guaranteed bit rate of 100 bits/TW, each channel has its own *respective* minimum guaranteed bit rate. As discussed above, the *respective* minimum guaranteed bit rates for channels LC1 and LC2 need not be different; they need only be independent. From the table, the TFC selection parameters (MLP, TW, MinGBr, and MaxBr) are independently assigned to logical channels LC1 and LC2. Although some of the parameters (e.g., MinGBr) have the same values, others (e.g., TW) have different values. *Id.*

Accordingly, having considered all the evidence and arguments presented by Petitioner and Patent Owner, at this stage of the proceeding and for the reasons discussed above, Petitioner has demonstrated a reasonable likelihood of showing the combination of TS25.321, R2-010182, and TS25.302 teaches or suggests all the limitations of claim 13.

2. Claim 11

Claim 11 is an independent claim, and recites a radio network controller (RNC) for a network having the properties of the network controlled by the method recited in claim 13. *Compare* Ex. 1001, 16:26–40, *with id*. at 16:54–65. For example, where the method of claim 13 requires controlling a network provided with “transport channels . . . for transmitting transport blocks formed from packet units of the logic channels,” claim 11 requires an RNC "for forming transport bl[o]cks from packet units of the logic channels and for transmitting the transport blocks through the transport channels." *Compare id.* at 16:28–31, *with id*. at 16:56–58. Similarly, where the method of claim 13 requires controlling a network provided with "a selection algorithm . . . for selecting the transport format combinations . . . [that] uses a minimum bit rate criteria," claim 11 requires the "selection algorithm is provided in the radio network controller for selecting the transport format combinations . . . while taking into account a minimum bit rate." *Compare id.* at 16:35–40, *with id*. at 16:61–65.

Given the similarity between claims 11 and 13, Petitioner largely relies on its analysis of claim 13 to meet the limitations recited in claim 11. *See* Pet. 40–45; *see also id*. at 23–40. First, Petitioner relies on its analysis of claim 13 to demonstrate how TS 25.321 teaches a UMTS network having an RNC that includes a MAC entity that controls mapping between logical channels and transport channels. *Id*. at 40–41; *see also id*. at 25–29. Next, Petitioner demonstrates how TS 25.321 teaches "the MAC-c/sh entity in the controlling RNC receives RLC-PDUs from its RLC and 'fit[s] [these RCL-PDUs] into the available transport blocks on the transport channels." *See id*. at 42–43 (quoting Ex. 1008 §§ 4.2.4, 4.2.4.1; citing Ex. 1002 ¶¶ 227–228) (emphasis omitted). Next, Petitioner relies on its analysis of claim 13 to demonstrate how TS 25.302 teaches the RNC's MAC layer allocates a number of valid transport format combinations to the transport channels that indicate the transport blocks for transmission on each transport channel. *Id.* at 44; *see also id*. at 30–34. Finally, Petitioner relies on its analysis of claim 13 to demonstrate how TS 25.321 teaches the RNC MAC includes a TFC selection algorithm, and how R2-010182 proposes modifying that algorithm so that it "relies on the minimum guaranteed bit rate of the logical channels . . . to select the TFCs." *Id.* at 44–45 (emphasis omitted); *see also id*. at 34–40.

Patent Owner, relying on the arguments set forth and discussed in §§ II.F.4 and II.G.1, *supra*, argues Petitioner has failed to demonstrate that R2-010182 is prior art to the '487 patent by failing to demonstrate it is a printed publication, and further argues that Petitioner has failed to demonstrate that R2-010182 teaches a TFC selection algorithm that takes into account a minimum bit rate obtaining for respective logical channels by failing to demonstrate that each logical channel has a respective minimum guaranteed bit rate. Prelim. Resp. 34–35;[9] *see also id*. at 21–29. We do not find these arguments persuasive for the reasons set forth in §§ II.F.4 and II.G.1, *supra*.

Accordingly, having considered all the evidence and arguments presented by Petitioner and Patent Owner, at this stage of the proceeding and for the reasons discussed above, Petitioner has demonstrated a reasonable likelihood of showing the combination of TS 25.321, R2-010182, and TS 25.302 teaches or suggests all the limitations of claim 11.

3. Claim 12

Claim 12 is an independent claim, and recites a terminal for a network having the properties of the network controlled by the method recited in claim 13. *Compare* Ex. 1001, 16:41–43, *with id*. at 16:54–65. For example,

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[9] Patent Owner mistakenly cites to §§ IV.B.1 and IV.B.2 of its Preliminary Response as setting forth these arguments. *See* Prelim. Resp. 34. No such sections exist; therefore, we consider the arguments set forth in §§ VI.B.1 and VI.B.2 of the Preliminary Response.

where the method of claim 13 requires controlling a network provided with "transport channels . . . for transmitting transport blocks formed from packet units of the logic channels," claim 12 requires a terminal "for transmitting transport blocks formed from packet units of the logic channels." *Compare id.* at 16:43–45, *with id*. at 16:56–58. Similarly, where the method of claim 13 requires controlling a network provided with "a selection algorithm . . . [that] uses a minimum bit rate criteria," claim 12 requires a terminal provided with "a selection algorithm . . . [where selection] is carried out while taking into account a minimum bit rate." *Compare id.* at 16:48–53, *with id*. at 16:61–65.

Given the similarity between claims 12 and 13, Petitioner largely relies on its analysis of claim 13 to meet the limitations recited in claim 12. *See* Pet. 41–45; *see also id*. at 23–40. First, Petitioner relies on its analysis of claim 13 to demonstrate how TS 25.321 teaches a UMTS network having a UE (terminal) that includes a MAC layer that controls mapping between logical and transport channels. *Id*. at 41–42; *see also id*. at 24–25, 27–29. Next, Petitioner relies on its analysis of claim 13 to demonstrate how TS 25.321 teaches the UE's MAC layer transmits transport blocks formed from packet units of the logic channels. *Id.* at 43–44; *see also id*. at 29–30. In particular, Petitioner demonstrates where TS 25.321 teaches an RLC layer in the UE "provides RLC-PDUs to the MAC, which fit into the available transport blocks on the transport channels." *Id*. at 29–30 (quoting Ex. 1008 § 4.2.3.1) (emphasis omitted). Petitioner further relies on its analysis of claim 13 to demonstrate how TS 25.302 teaches the UE's MAC layer allocates a number of valid transport format combinations to the transport channels that indicate the transport blocks for transmission on each transport channel. *Id.* at 44; *see also id*. at 30–34. Finally, Petitioner relies on its analysis of claim 13 to demonstrate how TS 25.321 teaches the UE's MAC layer includes a TFC selection algorithm, and how R2-010182 proposes modifying that algorithm so that it "relies on the minimum guaranteed bit rate of the logical channels . . . to select the TFCs." *Id.* at 44–45 (emphasis omitted); *see also id*. at 34–40.

Patent Owner, relying on the arguments set forth and discussed in §§ II.F.4 and II.G.1, *supra*, argues Petitioner has failed to demonstrate that R2-010182 is prior art to the '487 patent by failing to demonstrate it is a printed publication, and further argues that Petitioner has failed to demonstrate that R2-010182 teaches a TFC selection algorithm that takes into account a minimum bit rate obtaining for respective logical channels by failing to demonstrate that each logical channel has a respective minimum guaranteed bit rate. Prelim. Resp. 34–35;[10] *see also id*. at 21–29. We do not find these arguments persuasive for the reasons set forth in §§ II.F.4 and II.G.1, *supra*.

Accordingly, having considered all the evidence and arguments presented by Petitioner and Patent Owner, at this stage of the proceeding and for the reasons discussed above, Petitioner has demonstrated a reasonable likelihood of showing the combination of TS 25.321, R2-010182, and TS 25.302 teaches or suggests all the limitations of claim 12.

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[10] Patent Owner mistakenly cites to §§ IV.B.1 and IV.B.2 of its Preliminary Response as setting forth these arguments. *See* Prelim. Resp. 34. No such sections exist; therefore, we consider the arguments set forth in §§ VI.B.1 and VI.B.2 of the Preliminary Response.

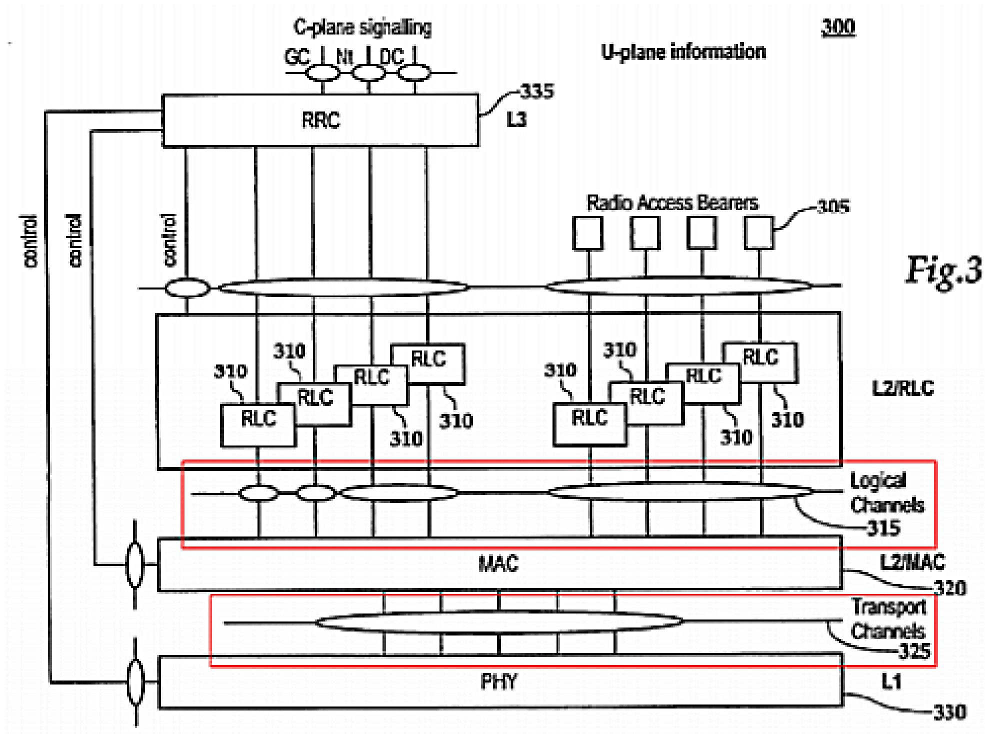
H. Patentability of Claims 11–13 over Peisa

Petitioner argues claims 11–13 are unpatentable over Peisa. *See* Pet. 46–69. As discussed in § II.C, *supra*, claims 11–13 are independent claims, and respectively recite a radio network controller, a terminal, and a method of controlling a network having the properties and functionality of the network recited in claim 1. *Compare id.* at 16:26–65, *with id*. at 14:40–50. Petitioner's analysis largely focuses on demonstrating how Peisa teaches or suggests the limitations of claim 13, a method of controlling a network having the functionality of the network of claim 1, but provides additional disclosure indicating how the network of claim 1 includes a radio network controller and a terminal have similar network functionality as required by independent claims 11 and 12. We largely follow Petitioner's analysis below.

1. Claim 13

Claim 13 recites a method of controlling a network with a first plurality of logic channels associated with a second plurality of transport channels. Ex. 1001, 16:54–56. Petitioner demonstrates how Peisa discloses a UMTS cellular network having a plurality of RNCs and UEs. Pet. 46–47 (citing Ex. 1013, 1:64–2:17, Fig. 1). Petitioner further demonstrates how Peisa discloses several processes performed by both UEs and RNCs to control the UMTS network, including "packet scheduling in accordance of quality of service (QoS) constraints for data flows." *Id.* at 47–48 (quoting Ex. 1013, 2:48–51; citing *id*. at 9:30–35).

Petitioner further demonstrates where Peisa teaches the UEs and RNCs include a MAC entity that "receives data transmitted in the logical channels 315 and further maps the data from the logical channels 315 onto a set of transport channels 325." *Id.* at 48–49 (quoting Ex. 1013, 6:41–65). This is shown, for example, in an annotated version of Figure 3 of Peisa, which is reproduced below.



Peisa, FIG. 3 (annotated)

Annotated Figure 3 is a Petitioner-annotated version of Figure 3 of Peisa. *Id.* at 49. It discloses a simplified, exemplary, layer 2 protocol structure that is involved in communications between UEs 110 and RNCs 140 in Peisa's UMTS network 100. Ex. 1013, 6:28–37. Patent Owner does not dispute these contentions. *See* Prelim. Resp. 19–33.

Claim 13 further recites the transport channels are provided for transmitting blocks formed from packet units of the logic channels. Ex. 1001, 16:56–58. Petitioner demonstrates how Peisa teaches UEs receive data flows via Radio Access Bearers (RABs) that are "mapped onto respective logical channels [315].” Pet. 51 (quoting Ex. 1013, 4:31–34, 6:41–55; citing *id*. Fig. 3) (emphasis omitted). In particular, Peisa teaches that data flows “from the RABs 305 are passed to respective Radio Link Control (RLC) entities 310,” which map the RABs “onto respective logical channels 315.” Ex. 1013, 6:45–50. Petitioner further demonstrates how the exemplary layer 2 architecture shown in Figure 3 “is applicable to both UEs and RNCs, being ‘involved in the communication between mobile stations . . . or more broadly UEs 110, and Radio Network Controllers (RNCs) of a UMTS network 100.’” Pet. 52 (quoting Ex. 1008, 6:28–37; citing Ex. 1002 ¶¶ 288–292).

Petitioner further demonstrates how Peisa teaches RLCs 310 buffer these data flows, and ultimately deliver them “as packets to the MAC entity [320] according to [a] selected TFC,” which schedules the “packets in accordance with the selected TFC.” *Id.* at 51 (quoting Ex. 1013, 10:29–56) (emphasis omitted). Petitioner further demonstrates how Peisa teaches MAC entity 320 “receives data transmitted in the logical channels 315 and further maps the data from the logical channels 315 onto a set of transport channels 325.” *Id.* at 49–50 (quoting Ex. 1013, 6:50–54) (emphasis omitted). Lastly, Petitioner demonstrates how Peisa teaches that “[f]or each transport channel 325, [an] RRC entity 335 defines one of several Transport Block (TB sizes) . . . . tells the MAC entity what packet sizes it can use to transmit data . . . . [and] informs the MAC entity 320 of a Transport Block Set (TBS) size, which is the total number of bits the MAC entity can transmit to the physical layer in a single transmission time interval (TTI).” *Id.* at 50 (quoting Ex. 1013, 7:2–11) (emphasis omitted). Patent Owner does not dispute these contentions. *See* Prelim. Resp. 19–33.

Claim 13 further recites a plurality of valid transport format combinations allocated to the transport channels that indicate the transport blocks provided for transmission on each transport channel. Ex. 1001, 16:58–61. Petitioner demonstrates how Peisa teaches the RRC-defined transport block parameters "TB size and TBS size, together with some additional information . . . form a TF [Transport Format]." Pet. 55 (quoting Ex. 1013, 7:11–13). Peisa further teaches that for a given transport channel, the "combination of [all possible] TFs is called a Transport Format Combination." Ex. 1013, 7:17–20. Petitioner further demonstrates how Peisa teaches RRC 335 ensures the total transmission capacity on all transport channels 325 does not exceed the transmission capacity of physical channel 330 by providing to "MAC entity 320 a Transport Format Combination Set (TFCS), which contains the *allowed* Transport Format Combinations [TFCs] for all transport channels." Pet. 53 (quoting Ex. 1013, 7:30–35) (partial emphases omitted). Petitioner further demonstrates how Peisa teaches MAC 320 decides how much data to transmit on each transport channel 325 by "choos[ing] one of these allowed transport format combinations from the transport format combination set." *Id.* at 53–54 (quoting Ex. 1013, 7:25–26, 7:57–59) (emphases omitted). Patent Owner does not dispute these contentions. *See* Prelim. Resp. 19–33.

Claim 13 further recites a selection algorithm for selecting the transport format combinations. Ex. 1001, 16:61–63. Petitioner demonstrates how "Peisa provides 'a method of allocating transmission resources' at a MAC entity of a node in a UMTS network'" that involves "selecting a Transport Format Combination (TFC) from a TFC Set." Pet. 56–57 (quoting Ex. 1013, 9:9–16) (emphasis omitted). Petitioner further demonstrates how Peisa discloses several algorithms for selecting a TFC from a TFCS, including a Figure 4 process described as an "exemplary algorithm for implementing . . . TFC selection," and a Figure 8 process described as a flow chart for "the selection of a TFC from a TFCS using a two-step scoring process." *Id.* at 57 (quoting Ex. 1013, 11:43–47, 18:29–34) (emphases omitted). Petitioner further demonstrates how these selection algorithms can be performed in UEs or RNCs of the UMTS network. *Id.* at 58 (quoting Ex. 1008, 9:30–35, 18:17–18). Patent Owner does not dispute these contentions. *See* Prelim. Resp. 19–33.

Lastly, claim 13 requires the selection algorithm to use a minimum bit rate criteria applicable to the respective logic channel. Ex. 1001, 16:61–65. Petitioner demonstrates how Peisa discloses the TFC selection algorithm of Figure 4 "[s]chedules packets by optimizing the throughput while still keeping the fairness (i.e., guaranteed rates)." Pet. 59 (quoting Ex. 1013, 11:43–49; citing *id*. Fig. 4) (emphasis omitted). Petitioner further demonstrates how the TFC selection algorithm of Figure 8 "uses a two-step scoring process, relying on logical channel parameters that include the 'Guaranteed Rate for each logical channel.'" *Id.* (quoting Ex. 1013, 18:29–57) (emphasis omitted). Using an annotated version of Figure 8, Petitioner demonstrates how Peisa teaches a TFC selection algorithm that "obtain[s] a guaranteed rate parameter for each logical channel (805); use[s] the guaranteed rate parameter to calculate [two scores] for each logical channel and for each TFC (810); and mak[es] a TFC selection based on the logical channel score (820)." *Id.* at 60 (citing Ex. 1008, Fig. 8). Petitioner's annotated version of Figure 8 of Peisa is reproduced below.

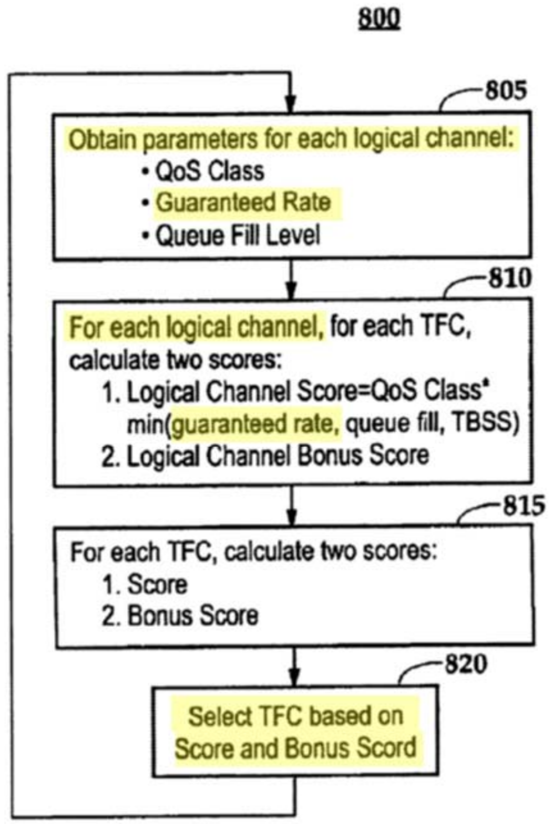


Fig.8

Annotated Figure 8 is a Petitioner-annotated version of Figure 8 of Peisa, highlighted to show a TFC selection algorithm that obtains a guaranteed rate for each logic channel (step 805), calculates two scores for each logical channel and each TFC in the set of TFCs (step 810) based in part on the guaranteed rate, and ultimately selects a TFC from the set of TFCs that is based on these two scores.[11] *See* Ex. 1013, 18:29–19:10.

[11] We note the TFC selection is based on two TFC-based scores: Score and Bonus_score. *See* Ex. 1013, 19:7–10. The TFC Score is the sum of scores, Score_lch, calculated for each logical channel in the TFC, and the TFC Bonus_score is the sum of scores, Bonus_score_lch, calculated for each logical channel in the TFC. *Id.* at 18:60–19:6.

Petitioner argues that Figure 8 of Peisa discloses a TFC selection algorithm "that satisfies 'at least the guaranteed rate for each flow,' where a flow corresponds to a logical channel." Pet. 61 (quoting Ex. 1013, 19:10–13) (emphasis omitted). Relying on the testimony of Dr. Buehrer, Petitioner argues that a person skilled in the art would have known that "Peisa's FIG. 8 flowchart corresponds to a selection algorithm that uses a minimum bit rate criteria applicable to the respective logic channel in performing TFC selection." *Id.* (citing Ex. 1002 ¶¶ 306–309).

Patent Owner argues that Petitioner has failed to establish that Peisa teaches a selection algorithm that "uses a minimum bit rate criteria applicable to [a] respective logic channel" as required by claim 13 because the Petition fails to "allege that the minimum bit rate criteria are different for different ones of the respective logical channels." Prelim. Resp. 33.

At this stage of the proceeding, we are not persuaded by Patent Owner's argument. As discussed in § II.G.1, *supra*, claim 13 does not require the minimum bit rate for each logical channel to be different from the minimum bit rate for any or every other logical channel; it simply requires each logical channel to have its own or *respective* minimum bit rate that is independent of, though not necessary different from, the respective minimum bit rates for the other logical channels. Peisa teaches that each logical channel is assigned its own or *respective* minimum bit rate. For example, in discussing the TFC selection algorithm shown in Figure 4, Peisa teaches using the array lch_guar_rate[lch], which is "[a]n array containing the guaranteed rate for each input flow ('logical channel')," indexed by logical channel parameter "lch." Ex. 1013, 14:41–42. Similarly, in discussing the TFC selection algorithm shown in Figure 8, Peisa teaches using the vector GuarRateVect[lch], which is a vector or array also indexed by logical channel parameter "lch." *See id*. at 19:18–20:8. This is shown, for example, in step 805 of Figure 8, where the Guaranteed Rate is a parameter that is obtained "for each logical channel." *Id.* Fig. 8; *see also id*. at 18:35–36, 18:41–43 (teaching "several parameters are obtained for each logical channel," and that "[t]he Guaranteed Rate for each logical channel may . . . be obtained from the corresponding RAB parameter").

Accordingly, having considered all the evidence and arguments presented by Petitioner and Patent Owner, at this stage of the proceeding and for the reasons discussed above, Petitioner has demonstrated a reasonable likelihood of showing Peisa teaches or suggests all the limitations of claim 13.

2. Claim 11

Claim 11 is an independent claim, and recites a radio network controller (RNC) for a network having the properties of the network controlled by the method recited in claim 13. *Compare* Ex. 1001, 16:26–40, *with id*. at 16:54–65. For example, where the method of claim 13 requires controlling a network provided with "transport channels . . . for transmitting transport blocks formed from packet units of the logic channels," claim 11 requires an RNC "for forming transport bl[o]cks from packet units of the logic channels and for transmitting the transport blocks through the transport channels." *Compare id.* at 16:28–31, *with id*. at 16:56–58. Similarly, where the method of claim 13 requires controlling a network provided with "a selection algorithm . . . for selecting the transport format combinations . . . [that] uses a minimum bit rate criteria," claim 11 requires the "selection algorithm is provided in the radio network controller for selecting the transport format combinations . . . while taking into account a minimum bit rate." *Compare id.* at 16:35–40, *with id*. at 16:61–65.

Given the similarity between claims 11 and 13, Petitioner largely relies on its analysis of claim 13 to meet the limitations recited in claim 11. *See* Pet. 62–64, 67–69; *see also id*. at 46–61. First, Petitioner demonstrates how Peisa teaches its UMTS network includes an RNC having a MAC layer that maps logical channels 315 onto transport channels 325. *Id.* at 62–64 (quoting Ex. 1013, 1:64–2:17, 6:24–65, 9:30–34, 18:17–18, Fig. 3). Next, Petitioner relies on its analysis of claim 13 to demonstrate how Peisa teaches the RNC's MAC layer schedules the transmission of data packets by mapping packets in logical channels to transport blocks transmitted through transport channels. *Id*. at 67; *see also id*. at 49–52. Next, Petitioner relies on its analysis of claim 13 to demonstrate how Peisa teaches the RNC's MAC layer allocates a number of valid transport format combinations to the transport channels that indicate the transport blocks for transmission on each transport channel. *Id.* at 68–69; *see also id*. at 52–56. Finally, Petitioner relies on its analysis of claim 13 to demonstrate how Peisa teaches the RNC's MAC layer includes a selection algorithm for selecting transport format combinations while taking into account a minimum bit rate. *Id.* at 69; *see also id*. at 56–61.

Patent Owner, relying on the arguments set forth and discussed in §§ II.F.3 and II.H.1, *supra*, argues Petitioner has failed to demonstrate that Peisa teaches a TFC selection algorithm that takes into account a minimum bit rate obtaining for respective logical channels because the Examiner considered Peisa and found it does not disclose this limitation, and because Petitioner has failed to allege that Peisa's guaranteed bit rate is different for different logical channels. Prelim. Resp. 35;[12] *see also id*. at 29, 33. We do not find these arguments persuasive for the reasons set forth in §§ II.F.3 and II.H.1, *supra*.

Accordingly, having considered all the evidence and arguments presented by Petitioner and Patent Owner, at this stage of the proceeding and for the reasons discussed above, Petitioner has demonstrated a reasonable likelihood of showing Peisa teaches or suggests all the limitations of claim 11.

3. Claim 12

Claim 12 is an independent claim, and recites a terminal for a network having the properties of the network controlled by the method recited in claim 13. *Compare* Ex. 1001, 16:41–43, *with id*. at 16:54–65. For example, where the method of claim 13 requires controlling a network provided with "transport channels . . . for transmitting transport blocks formed from packet units of the logic channels," claim 12 requires a terminal "for transmitting transport blocks formed from packet units of the logic channels." *Compare id.* at 16:43–45, *with id*. at 16:56–58. Similarly, where the method of claim 13 requires controlling a network provided with "a selection algorithm . . . [that] uses a minimum bit rate criteria," claim 12 requires a terminal provided with "a selection algorithm . . . [where selection] is carried out while taking into account a minimum bit rate." *Compare id.* at 16:48–53, *with id*. at 16:61–65.

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[12] Patent Owner mistakenly cites to §§ IV.B.3 and IV.B.4 of its Preliminary Response as setting forth these arguments. *See* Prelim. Resp. 35. No such sections exist; therefore, we consider the arguments set forth in §§ VI.B.3 and VI.B.4 of the Preliminary Response.

Given the similarity between claims 12 and 13, Petitioner largely relies on its analysis of claim 13 to meet the limitations recited in claim 12. *See* Pet. 64–66. 68–69; *see also id*. at 46–61. First, Petitioner demonstrates how Peisa teaches its UMTS network includes a UE (mobile terminal) having a MAC layer that maps logical channels 315 onto transport channels 325. *Id*. at 64–66 (quoting Ex. 1008, 1:64–2:17, 6:24–65, 9:30–34, 18:17–18, Fig. 3). Next, Petitioner relies on its analysis of claim 13 to demonstrate how Peisa teaches the UE's MAC layer transmits transport blocks formed from packets of logical channels. *Id*. at 68; *see also id*. at 49–52. Next, Petitioner relies on its analysis of claim 13 to demonstrate how Peisa teaches the UE's MAC layer allocates a number of valid transport format combinations to the transport channels that indicate the transport blocks for transmission on each transport channel. *Id.* at 68–69; *see also id*. at 52–56. Finally, Petitioner relies on its analysis of claim 13 to demonstrate how Peisa teaches the UE's MAC layer includes a selection algorithm for selecting transport format combinations while taking into account a minimum bit rate. *Id.* at 69; *see also id*. at 56–61.

Patent Owner, relying on the arguments set forth and discussed in §§ II.F.3 and II.H.1, *supra*, argues Petitioner has failed to demonstrate that Peisa teaches a TFC selection algorithm that takes into account a minimum bit rate obtaining for respective logical channels because the Examiner considered Peisa and found it does not disclose this limitation, and because Petitioner has failed to allege that Peisa's guaranteed bit rate is different for different logical channels. Prelim. Resp. 35;[13] *see also id*. at 29, 33. We do

[13] Patent Owner mistakenly cites to §§ IV.B.3 and IV.B.4 of its Preliminary

not find these arguments persuasive for the reasons set forth in §§ II.F.3 and II.H.1, *supra*.

Accordingly, having considered all the evidence and arguments presented by Petitioner and Patent Owner, at this stage of the proceeding and for the reasons discussed above, Petitioner has demonstrated a reasonable likelihood of showing Peisa teaches or suggests all the limitations of claim 12.

III. CONCLUSION

We have reviewed the Petition and Preliminary Response, and have considered all of the evidence and arguments presented by Petitioner and Patent Owner. We find, on this record, Petitioner has demonstrated a reasonable likelihood of showing claims 11–13 of the ’487 patent are unpatentable. Accordingly, we institute *inter partes* review of all claims on all grounds raised in the Petition.

The Board has not yet made a final determination with respect to any claim construction issue or the patentability of any challenged claim.

Response as setting forth these arguments. *See* Prelim. Resp. 35. No such sections exist; therefore, we consider the arguments forth in §§ VI.B.3 and VI.B.4 of the Preliminary Response.

IV. ORDER

It is ORDERED that, pursuant to 35 U.S.C. § 314, an *inter partes* review is hereby instituted on all challenged claims on all grounds.

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this Decision.

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