

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA**

CASE NO. 12-23568-CIV-ALTONAGA/Simonton

Wi-LAN USA, INC. and Wi-LAN, INC.,

Plaintiffs/Counterclaim Defendants,

vs.

ALCATEL-LUCENT USA, INC.,

Defendant/Counterclaim Plaintiff.

ORDER ON CLAIM CONSTRUCTION

THIS CAUSE came before the Court for claim construction. The Court has carefully considered the extensive briefing by the parties, pertinent portions of the record and authorities, and heard argument and received evidence at a *Markman*¹ hearing held on August 9, 2013.

I. BACKGROUND

A. Procedural Background

Plaintiff/Counterclaim Defendant, Wi-LAN, Inc., is the sole owner of United States Patent Numbers 8,027,298 (“the ’298 patent”), titled “Methods and Systems for Transmission of Multiple Modulated Signals over Wireless Networks;” 8,249,014 (“the ’014 patent”), titled “Methods and Systems for Transmission of Multiple Modulated Signals over Wireless Networks;” and 8,229,437 (“the ’437 patent”), titled “Pre-Allocated Random Access Identifiers” (collectively, the “Asserted Patents”). (See Am. Compl. ¶¶ 24, 35, 46 [ECF No. 72]). Plaintiff/Counterclaim Defendant, Wi-LAN, USA Inc., a wholly owned subsidiary of Wi-LAN,

¹ *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (*en banc*), *aff’d*, 517 U.S. 370 (1996).

Inc., holds certain rights under the Asserted Patents, including rights to license. (*See id.* ¶¶ 1, 24, 35, 46).

On October 1, 2012, Wi-LAN, USA Inc. and Wi-LAN, Inc. (collectively, “Wi-LAN”) brought this action against Defendant/Counterclaimant, Alcatel-Lucent USA, Inc. (“Alcatel-Lucent”). (*See* Compl. [ECF No. 1]). On February 6, 2013, Wi-LAN filed an Amended Complaint, alleging that Alcatel-Lucent makes, uses, offers for sale, and imports into the United States, products that fall within the scope of one or more claims of the Asserted Patents, and thus infringes the Asserted Patents. (*See generally* Am. Compl.). On February 21, 2013, Alcatel-Lucent filed its Answer and Counterclaims to Plaintiffs’ First Amended Complaint (“Answer”) [ECF No. 76], denying infringement and raising several affirmative defenses, including the doctrines of laches, estoppel, and/or waiver; as well as invalidity of the Asserted Patents for failure to satisfy one or more of the requirements of 35 U.S.C. sections 101, 102, 103, and 112. (*See* Answer and Countercl. 8–9). Alcatel-Lucent also raises several counterclaims against Wi-LAN, seeking, against each Asserted Patent, a declaratory judgment of noninfringement and invalidity for failure to meet the conditions of patentability and/or otherwise comply with one or more of 35 U.S.C. sections 101, 102, 103, and 112. (*See id.* at 11–14). In Wi-LAN’s Answer to Counterclaims [ECF No. 80], filed March 6, 2013, Wi-LAN denies the merits of Alcatel-Lucent’s counterclaim assertions. (*See generally* Answer to Countercl.).

The parties have identified multiple terms and phrases from the Asserted Patents that are disputed and require claim construction. On June 12, 2013, Wi-LAN filed an Opening Claim Construction Brief (“Wi-LAN Opening”) [ECF No. 91], and Alcatel-Lucent filed an Opening Claim Construction Brief (“Alcatel-Lucent Opening”) [ECF No. 90]. On July 17, 2013, Wi-LAN filed a Responsive Claim Construction Brief (“Wi-LAN Response”) [ECF No. 98], and

Alcatel-Lucent filed a Response to Wi-LAN’s Opening Claim Construction Brief (“Alcatel-Lucent Response”) [ECF No. 97]. After the *Markman* hearing, the parties conferred and filed a Joint Notice of Proposed Claim Constructions (“Joint Notice”) [ECF No. 125] that reflects the parties’ latest agreements, withdrawals, and proposed claim constructions.

B. Factual Background

1. The ’298 and ’014 Patents

The ’298 Patent was issued on September 27, 2011, and relates to an application filed on May 21, 1999. (*See* the ’298 patent [ECF No. 91-1]). The ’014 patent, issued on August 21, 2012, is a continuation of the ’298 patent. (*See* the ’014 patent [ECF No. 91-2]). The ’298 and ’014 patents share the same specification, that is, the portion of the patent document that describes the manner and process of making and using the patented invention, *see* 35 U.S.C. section 112(a); but they have different claims, “the portion of the patent document that defines the scope of the patentee’s rights,” *Markman*, 517 U.S. at 372. The specification² describes in the “Background of the Invention” that “[t]his invention relates to wireless communications systems, and more particularly to a method and apparatus for efficiently allocating bandwidth between base stations and customer premises equipment [(“CPEs”)] in a broadband wireless communication system.” (’298 Patent, col. 1, ll. 20–24).

“The broadband wireless communication system facilitates two-way communication between a plurality of base stations and a plurality of fixed subscriber stations or Customer Premises Equipment (CPE).” (*Id.* at col. 1, ll. 62–65). “CPEs [] request bandwidth allocations from their respective base stations [] based upon the type and quality of services requested by the customers served by the CPE. . . . The type and quality of services available to the customers are

² With regard to the ’298 and ’014 patents, reference to “the specification” will be a reference to the patents’ shared specification. Unless citing particularly to the ’014 patent, which will be so indicated, the Court will use the column and line numbers of the ’298 patent specification.

variable and selectable. The amount of bandwidth dedicated to a given service is determined by the information rate and the quality of service required by that service” (*Id.* at col. 2, ll. 16–24). Some continuous data services require a great deal of bandwidth having well-controlled delivery latency, while other services may be bursty and often idle, and thus relatively insensitive to delay variations when active. (*See id.* at col. 2, ll. 25–33).

Due to the wide variety of service requirements and the number of CPEs served by any one base station, “the bandwidth allocation process in a broadband wireless communication system . . . can become burdensome and complex. This is especially true with regard to the allocation of uplink³ bandwidth” because base stations “do not have a priori information regarding the bandwidth or quality of services that a selected CPE will require at any given time.” (*Id.* at col. 2, ll. 34–42 (footnote added)). As a consequence, requests for changes to uplink bandwidth allocation are frequent and varying, and “[i]f left unchecked, the bandwidth required to accommodate CPE bandwidth allocation requests will become disproportionately high in comparison with the bandwidth allocated for the transmission of substantive traffic data.” (*Id.* at col. 2, ll. 48–52). The patented invention uses a combination of bandwidth request and allocation techniques in order to provide a method and apparatus for dynamically and efficiently requesting and allocating bandwidth in a broadband wireless communication system. (*See id.* at col. 2, ll. 55–57; *id.* at col. 3, ll. 56–58, 63–65).

With regard to requests for bandwidth, the invention controls the opportunities for allowing CPEs to make requests and ultimately reduces the amount of bandwidth that must be allocated for bandwidth request purposes. (*See id.* at col. 3, ll. 58–62). One bandwidth request technique utilized by the invention is a “polling” technique in which the base station polls an

³ Transmissions from a base station to a subscriber unit or CPE are referred to as “downlink” transmissions, and transmissions from a subscriber unit or CPE to a base station are referred to as “uplink” transmissions. (’298 patent, col. 1, ll. 49–52).

individual CPE or group of CPEs by allocating uplink bandwidth in an uplink sub-frame map to allow the CPE(s) to respond with a bandwidth request. (*Id.* at col. 4, ll. 9–15). “The polling of the CPEs by the base station may be in response to a CPE setting a ‘poll-me bit’ or, alternatively, it may be periodic.” (*Id.* at col. 4, ll. 4–6). Another means used by the present invention is a technique of “‘piggybacking’ bandwidth requests on bandwidth already allocated to a CPE. In accordance with this technique, currently active CPEs request bandwidth using previously unused portions of uplink bandwidth that is already allocated to the CPE,” or, alternatively, the bandwidth request can be “piggybacked on uplink bandwidth already allocated and currently being used by a data service.” (*Id.* at col. 4, ll. 24–30).

With regard to the allocation of bandwidth, the base station has a Media Access Control (“MAC”) protocol which allocates bandwidth for both the uplink and downlink communication links. (*See id.* at col. 6, ll. 17–18). A time-division duplexing (“TDD”) scheme divides time into upstream (uplink) and downstream (downlink) transmission periods. (*See id.* at col. 6, ll. 45–47). “The base station is the only transmitter operating in the downlink direction, hence it transmits without having to coordinate with other base stations, except for the overall time-division duplexing” (*Id.* at col. 6, ll. 43–46). In contrast, the CPEs “share the uplink on a demand basis that is controlled by the base station MAC.” (*Id.* at col. 6, ll. 51–52). The base station MAC is also responsible for mapping the bandwidth being allocated on the uplink and downlink communication links. (*See id.* at col. 6, ll. 17–18). “These maps are developed and maintained by the base station and are referred to as the Uplink Sub-frame Maps and Downlink Sub-frame Maps.” (*Id.* at col. 6, ll. 18–21).

For downlink bandwidth allocation, “[t]he base station MAC maintains a set of queues for each physical channel that it serves. Within each physical channel queue set, the base station

maintains a queue for each QoS [quality of service]. The queues hold data that is ready to be transmitted to the CPEs present on the physical channel.” (*Id.* at col. 18, ll. 45–49). “The data is transmitted in order of a QoS queue priority” (*Id.* at col. 19, ll. 48–49). If there is a “QoS queue for which there is insufficient bandwidth to transmit all queued data during the current TDD frame” then “a QoS specific fairness algorithm is initiated to ensure fair handling of the data queued at that QoS.” (*Id.* at col. 19, ll. 48–54).

The uplink bandwidth allocation method is similar to the downlink allocation method except that the data queues are distributed across and maintained by each individual CPE, rather than by the base station. (*See id.* at col. 19, ll. 9–13). “[T]he base station reconstructs a logical picture of the state of the CPE data queues” and “[b]ased on this logical view . . . allocates uplink bandwidth in the same way as it allocates downlink bandwidth.” (*Id.* at col. 19, ll. 17–21). The bandwidth allocated to a CPE is transmitted in the form of bandwidth being allocated in the uplink sub-frame map. (*See id.* at col. 19, ll. 23–25). Once uplink bandwidth is allocated to a CPE, the CPE is responsible for distributing the allocated bandwidth in a manner that accommodates the services provided by the CPE. (*See id.* at col. 4, ll. 34–36). This may be in a manner that is different from that originally requested or granted by the base station. (*See id.* at col. 4, ll. 36–38). Transferring this responsibility from the base station to the CPE is another means by which the invention saves on communication resources. (*See id.* at col. 4, ll. 41–46).

In addition to the detailed description of the invention, the specification of the ’298 and ’014 patents includes thirteen figures, including figures showing: a broadband wireless communication system adapted for use with the present invention (*see id.* at Fig. 1; *id.* at col. 5, ll. 14–15); exemplary uplink and downlink sub-frames for use with the invention (*see id.* at Figs. 3 & 4; *id.* at col. 5, ll. 19–24); an exemplary uplink sub-frame map used to facilitate the patented

invention's multicast/broadcast bandwidth allocation technique (*see id.* at Fig 7; *id.* at col. 5, ll. 30–32); and flow diagrams showing use of a “poll-me” to stimulate polling of a CPE (*see id.* at Fig. 9; *id.* at col. 5, ll. 35–37) and the bandwidth request piggybacking process of the patented invention (*see id.* at Fig. 11; *id.* at col. 5, ll. 40–41). The '298 and '014 patents conclude with twenty-nine and seven claims, respectively, that articulate the scope of the patentee's rights. (*See* '298 patent, cols. 23–26; '014 patent, cols. 23–24).

2. The '437 Patent

The '437 patent was issued on July 24, 2012, and relates to an application filed on September 1, 2006. (*See* the '437 patent [ECF No. 91-3]). The '437 patent covers an invention that facilitates the maintenance of communication between base stations and wireless devices (“subscriber stations”) in a “handover” context, where a mobile subscriber station transitions from the coverage area of a “serving base station” to the coverage area of a “target base station.” (*Id.* at col. 20, ll. 1–9). The claimed invention involves a system and method of pre-allocating identification codes to wireless devices for use in requesting resources over a random access channel in a wireless communication system. (*See id.* at Abstract).

“A wireless communication system includes a random access channel over which wireless devices can anonymously send requests for resources.” (*Id.*). Each base station can allocate some resources to support the random access channel used by the subscriber stations. (*See id.* at col. 4, ll. 55–58). Base stations may support the use of distinct pseudorandom codes that correspond to four usage types (initial ranging, periodic ranging, bandwidth request, and handover) for conveying information over the random access channel. (*See id.* at col. 5, ll. 18–24). A usage type map for these random access codes may be broadcast from a base station in an Uplink Channel Descriptor. (*See id.* at col. 12, ll. 17–19).

In general, a subscriber station with a need for communicating information with the base station, can “randomly select a code from the available group of codes corresponding to a usage type” and send “the randomly selected code . . . to the base station [] over the random access channel.” (*Id.* at col. 5, ll. 31–36). When the base station receives a code over the random access channel, it does not know the identity of the transmitting subscriber station and can only identify the purpose of the request based on the group in which the code belongs. (*See id.* at col. 5, ll. 48–52). In response, the base station initially grants a small amount of bandwidth to the source of the code in order for the subscriber station to identify itself and transmit details of its request. (*See id.* at col. 5, ll. 54–56; *id.* at col. 16, ll. 55–62). This process has a large latency period, can be cumbersome, and, where two distinct subscriber stations select the same code for transmission in the same instance on the random access channel, presents the possibility of code collision. (*See id.* at col. 5, ll. 56–62).

As part of the claimed invention, a base station can set aside a certain number of its codes for pre-allocation to subscriber stations that register within its coverage area and that can support pre-allocated codes. (*See id.* at col. 6, ll. 20–22; *id.* at col. 12, ll. 43–45). These codes cannot be randomly selected for random access channel requests. (*See id.* at col. 12, ll. 45–47). “The base station [] tracks the code allocation such that each of the allocatable codes are allocated to at most one subscriber station at a time,” and the “subscriber station having pre-allocated codes releases the pre-allocated codes when it de-registers with the base station [].” (*Id.* at col. 6, ll. 20–26). When the base station receives a pre-allocated code in the random access channel, the base station can determine the identity of the subscriber station and react to the request faster because it has more information about the specific request. (*See id.* at col. 10, ll. 27–31; *id.* at col. 3, ll. 1–3). The base station can also initiate a feedback control signal or message to the

subscriber station that is relevant to that particular subscriber station, such as an instruction for the subscriber station to advance or delay its transmission time in order to better align with the system timing. (*See id.* at col. 11, ll. 17–20, 45–49). Pre-allocating codes to select subscriber stations reduces the probability of random access channel collisions and conserves base station resources needed to support anonymous requests for resources. (*See id.* at col. 1, ll. 38–42).

In addition to the detailed description of embodiments of the invention, the specification of the '437 patent includes six figures, including figures showing: a simplified functional block diagram of an embodiment of a base station implementing pre-allocated random access identifiers (*see id.* at Fig. 2; *id.* at col. 2, ll. 46–48); a subscriber station implementing pre-allocated random access identifiers (*see id.* at Fig. 3; *id.* at col. 2, ll. 49–51); and a flowchart of an embodiment of processing pre-allocated random access identifiers (*see id.* at Fig 5; *id.* at col. 2, ll. 54–55). The '437 patent concludes with twenty claims that articulate the scope of the patentee's rights. (*See id.* at cols. 21–22).

II. LEGAL FRAMEWORK

A. General Principles of Claim Construction

The construction of a patent is a matter of law to be determined by the Court. *See Markman*, 517 U.S. at 372. And “[i]t is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Aventis Pharms. Inc. v. Amino Chemicals Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citation omitted). “[I]n interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

“[I]ntrinsic evidence is the most significant source of the legally operative meaning of the disputed claim language.” *Id.*

In construing patent claims, the Court first looks to the claim language, because “the claims themselves provide substantial guidance as to the meaning of particular claim terms.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005). “[W]ords of a claim are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.” *Id.* at 1312–13 (citations and internal quotation marks omitted). The presumption that words have their ordinary and customary meaning when used in a patent claim is rebutted where the patentee, acting as his own or her own “lexicographer,” has clearly stated in the patent specification or file history a definition of a claim term that is different from the term’s ordinary and customary meaning. *Vitronics Corp.*, 90 F.3d at 1582; *see also Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002) (“[A]n inventor may choose to be his own lexicographer if he defines the specific terms used to describe the invention with reasonable clarity, deliberateness, and precision.” (citations and internal quotation marks omitted)). A patentee may otherwise demonstrate an intent to deviate from the ordinary and accustomed meaning of a claim term, in the specification or prosecution history, by using expressions of “manifest exclusion or restriction, representing a clear disavowal of claim scope.” *Teleflex, Inc.*, 299 F.3d at 1325–26.

In addition to the claims themselves, the Court should consider “the appropriate context in which the claim term is used.” *Aventis Pharms. Inc.*, 715 F.3d at 1373. So, for example, “[t]he written description and other parts of the specification . . . may shed contextual light on the plain and ordinary meaning,” unless, again, the inventor acted as his own lexicographer or

disclaimed or disavowed claim scope. *Id.* (citation omitted). The specification is generally considered “the single best guide to the meaning of a disputed term” and “[u]sually, [] is dispositive.” *Vitronics Corp.*, 90 F.3d at 1582. Nevertheless, the Federal Circuit has repeatedly warned against importing limitations from the specifications into the claims. *See, e.g., Phillips*, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments. . . . In particular, we have expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment.” (internal citations omitted)). Likewise, “[t]hat claims are interpreted in light of the specification does not mean that everything expressed in the specification must be read into all the claims.” *Teleflex, Inc.*, 299 F.3d at 1326 (citation and internal quotation marks omitted).

If presented, another piece of intrinsic evidence that a Court may consider in claim construction is the patent’s prosecution history, a record of the proceedings before the Patent and Trademark Office (“PTO”), including the prior art cited during the examination of the patent. *See Phillips*, 415 F.3d at 1317. Although “it often lacks the clarity of the specification” because it “represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation,” the “prosecution history provides evidence of how the PTO and the inventor understood the patent.” *Id.*

A court engaging in claim construction is also authorized to rely on evidence external to the patent, including dictionaries, learned treatises, and expert and inventor testimony. *See id.* Such extrinsic evidence “can shed useful light on the relevant art,” but is “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Id.* (citations and internal quotation marks omitted). “In most situations, an analysis of the intrinsic

evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.” *Vitronics Corp.*, 90 F.3d at 1583.

B. Indefiniteness

The specification of a patent is required to “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.” 35 U.S.C. § 112(b).⁴ “Because claims delineate the patentee’s right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds of the protected invention, i.e., what subject matter is covered by the exclusive rights of the patent.” *Halliburton Energy Serv., Inc. v. M-I LLC*, 514 F.3d 1244, 1249 (Fed. Cir. 2008) (citation omitted). “A claim that is amenable to construction is not invalid on the ground of indefiniteness.” *Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1371 (Fed. Cir. 2006); *see also Halliburton Energy Serv., Inc.*, 514 F.3d at 1249 (“[C]laims are not indefinite merely because they present a difficult task of claim construction.”). Rather, claims are held to be indefinite “only where a person of ordinary skill in the art could not determine the bounds of the claims, i.e., the claims [are] insolubly ambiguous.” *Halliburton Energy Serv., Inc.*, 514 F.3d at 1249; *see also Personalized Media Commc’ns, LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 705 (Fed. Cir. 1998) (“Determining whether a claim is definite requires an analysis of ‘whether one skilled in the art would understand the bounds of the claim when read in light of the specification. . . .’” (quoting *Miles Lab., Inc. v. Shandon, Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993))). To be successful, an accused infringer must show “by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on

⁴ Cases filed before September 16, 2012 refer to 35 U.S.C. section 112(b) as 35 U.S.C. section 112, paragraph 2. Paragraph two of 35 U.S.C. section 112 was replaced with newly designated section 112(b) when section 4(c) of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, took effect.

the claim language, the specification, and the prosecution history, as well as her knowledge of the relevant art area.” *Halliburton Energy Serv., Inc.*, 514 F.3d at 1249–50.

C. Means-Plus-Function Claim Limitations

An additional claim construction principle relevant to this case relates to the means-plus-function claim limitation under 35 U.S.C. section 112(f)⁵ (“Section 112(f”). According to Section 112(f), instead of identifying a specific structure contained in a patented device, a patentee may claim a means for performing a specified function without expressly claiming a structure for performing that function. *See* 35 U.S.C. § 112(f). Specifically, Section 112(f) provides that “[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” *Id.*

“Means-plus-function claiming applies only to purely functional limitations that do not provide the structure that performs the recited function.” *Phillips*, 415 F.3d at 1311. Thus, before making a determination of the claimed function and corresponding structure, the Court must determine whether the limitation in question invokes Section 112(f) in the first instance. *See Rodime PLC v. Seagate Tech., Inc.*, 174 F.3d 1294, 1302 (Fed. Cir. 1999) (“To interpret the claims, this court must decide the subsidiary question of whether the claim element disputed by the parties invokes § 112, ¶ 6 in the first instance.”). A claim limitation that actually uses the word “means” invokes a rebuttable presumption that it is a means-plus-function claim and that Section 112(f) applies. *See Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354,

⁵ Cases filed before September 16, 2012 refer to 35 U.S.C section 112(f) as 35 U.S.C. section 112, paragraph 6. Paragraph six of 35 U.S.C. section 112 was replaced with newly designated section 112(f) when section 4(c) of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, took effect.

1358 (Fed. Cir. 2004). “By contrast, a claim term that does not use ‘means’ will trigger the rebuttable presumption that [Section 112(f)] does not apply.” *Id.* (citation and internal quotation marks omitted). “[T]he presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome.” *Id.* The presumption can only be overcome if the challenger demonstrates that “the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.” *Id.* (citations and internal quotation marks omitted).

If it is determined that Section 112(f) applies, the Court follows a two-step approach to construe the means-plus-function claim. The Court must first identify the particular claimed function using traditional tools of claim construction. *See Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1330 (Fed. Cir. 2003). The Court may not adopt a function different from that explicitly recited in the claim. *See Micro Chem., Inc. v. Great Plains Chem. Co., Inc.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999); *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002) (“The court must construe the function of a means-plus-function limitation to include the limitations contained in the claim language, and only those limitations.” (citation omitted)). Next, the Court must look to the specification and identify the corresponding structure that performs those functions. *See Med. Instrumentation & Diagnostics Corp.*, 344 F.3d at 1210. A disclosed structure is “‘corresponding’ [] only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim,” *id.* (citation and internal quotation marks omitted), and only if the structure can perform the claimed function, *see Cardiac Pacemakers, Inc.*, 296 F.3d at 1113. This inquiry is taken from the perspective of a person of ordinary skill in the art. *See id.* If, however, the Court’s inquiry “reveals that no

embodiment discloses corresponding structure, the claim is invalid for failure to satisfy the definiteness requirement of § 112, ¶ 2.” *Id.* at 1114 (citations omitted).

III. CLAIM CONSTRUCTION

The parties dispute the following terms and phrases in the Asserted Patents: (1) bandwidth/bandwidth request; (2) explicit message/explicit message received from [a/the] subscriber unit; (3) uplink (UL) queue/pertaining to a UL queue established at the subscriber unit/pertaining to one of a plurality of UL queues at the subscriber unit; (4) connections [established] at the subscriber unit/group of connections; (5) broadband wireless communication system; (6) UL map/DL map/map; (7) random access identifier; (8) a processor configured to . . . /processors having a media access control module configured to . . . /a module configured to The Court addresses each of these terms and phrases below.

A. Terms and Phrases Used In the '298 and '014 Patents

1. “Bandwidth” / “Bandwidth request”

The parties dispute the construction of the term “bandwidth,” in Claims 1, 2, 4–7, 11 of the '298 patent and Claims 1–6 of the '014 patent; and the phrase “bandwidth request,” in Claims 1, 2, and 4–7 of the '298 patent, and Claims 1, 4, and 6 of the '014 patent. (*See* Joint Notice 2).

The relevant claims of the '298 patent, with the disputed term “bandwidth” in bold and the disputed phrase “bandwidth request” in bold and underlined, are as follows:

Claim 1: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a **bandwidth request** in uplink (UL) data received from a subscriber unit and identify in the **bandwidth request** a requested amount of UL **bandwidth** pertaining to a UL queue established at the subscriber unit;

determine if the requested amount of **bandwidth** is available; and

allocate to the subscriber unit an UL **bandwidth** grant based on the requested amount and the **bandwidth** available for UL data, wherein the UL **bandwidth** grant is allocated to the subscriber unit for distribution, without any control from the base station, between the connections established at the subscriber unit.

('298 patent, col. 23, ll. 10–29).

Claim 2: A base station as claimed in claim 1, wherein upon identification of an explicit message received from the subscriber unit, the base station responds by providing the subscriber unit with an allocation of UL **bandwidth** for enabling the subscriber unit to transmit the **bandwidth request** to the base station.

(*Id.* at col. 23, ll. 30–35).

Claim 4: A base station as claimed in claim 1, wherein the **bandwidth request** is identified within UL **bandwidth** allocated to the subscriber unit for traffic.

(*Id.* at col. 23, ll. 39–41).

Claim 5: A base station as claimed in claim 1, wherein the **bandwidth request** is identified within UL **bandwidth** specifically allocated to the subscriber units for respective **bandwidth requests**.

(*Id.* at col. 23, ll. 42–45).

Claim 6: A base station as claimed in claim 1, wherein the **bandwidth request** is identified within UL **bandwidth** specifically allocated to a group of connections for **bandwidth requests**.

(*Id.* at col. 23, ll. 46–48).

Claim 7: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units;

a receiver for receiving uplink (UL) traffic from the subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a **bandwidth request** in UL data received from a subscriber unit and identify in the **bandwidth request** a requested amount of UL **bandwidth** pertaining to a UL queue established at the subscriber unit;

determine if the requested amount of **bandwidth** is available;

allocate to the subscriber unit an UL **bandwidth** grant based on the requested amount and the **bandwidth** available for UL data, wherein the UL **bandwidth** grant is allocated to the subscriber unit for distribution between the connections established at the subscriber unit, without any control from the base station; and

a memory for storing a logical view of UL queues maintained by the subscriber unit, the queues being maintained based on the **bandwidth requests** received from the subscriber unit.

(*Id.* at col. 23, l. 49–col. 24, l. 6).

Claim 11: A base station as claimed in claim 1, wherein the **bandwidth** grant is further determined based on one or more **bandwidth** (BW) allocation parameters.

(*Id.* at col. 24, ll. 20–22).

The relevant claims of the '014 patent, with the disputed term “bandwidth” in bold and the disputed phrase “bandwidth request” in bold and underlined, are as follows:

Claim 1: A base station for a broadband wireless communication system, comprising:

a transmitter system for transmitting downlink (DL) traffic to a plurality of subscriber units and a receiver for receiving uplink (UL) traffic from the plurality of subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a **bandwidth (BW) request** in the UL traffic received from a subscriber unit,

identify in the **BW request** a requested amount of UL **bandwidth** pertaining to a specified connection established at the subscriber unit,

determine if **bandwidth** is available for the subscriber unit, and then allocate to the subscriber unit a granted amount of UL **bandwidth**,

maintain an UL map with uplink **bandwidth** allocations,

dynamically update the UL map to account for the granted amount of UL **bandwidth**,

provide the updated UL map to the transmitter system for transmitting to plurality of subscriber units, and

indicate to the subscriber unit that the request has been granted by providing the granted amount of UL **bandwidth** to the subscriber unit.

('014 patent, col. 23, ll. 5–28).

Claim 2: The base station as claimed in claim 1, wherein the granted amount of UL **bandwidth** is equal to the requested amount of UL **bandwidth**.

(*Id.* at col. 23, ll. 29–31).

Claim 3: The base station as claimed in claim 1, wherein the granted amount of UL **bandwidth** is allocated from the base station to the subscriber unit based on a type of service established for the specified connection.

(*Id.* at col. 23, ll. 32–35).

Claim 4: A base station for a broadband wireless communication system which transmits downlink (DL) traffic to subscriber units and receives uplink (UL) traffic from the subscriber units, the base station comprising:

an antenna system for transmitting downlink (DL) traffic to subscriber units and receiving uplink (UL) traffic from the subscriber units;

one or more processors having a media access control (MAC) module configured to

detect a **bandwidth (BW) request** in the UL traffic received from a subscriber unit,

identify in the **BW request** a requested amount of UL **bandwidth** pertaining to a specified connection established at the subscriber unit,

determine if **bandwidth** is available for the subscriber unit, and allocate to the subscriber unit a granted amount of UL **bandwidth**, if **bandwidth** is available for the subscriber unit,

maintain a DL map and an UL map with downlink and uplink **bandwidth** allocations respectively,

dynamically update the UL map to account for the granted amount of UL **bandwidth**, if the granted amount of UL **bandwidth** is granted, and

provide updated DL and UL maps to the antenna system for transmitting to the subscriber units.

(*Id.* at col. 23, l. 36–col. 24, l. 11).

Claim 5: The base station as claimed in claim 4 wherein the granted amount of UL **bandwidth** is equal to the requested amount of UL **bandwidth**.

(*Id.* at col. 24, ll. 12–14).

Claim 6: A method of allocating **bandwidth** to subscriber units from a base station operating in a wireless communication system, comprising:

identifying an explicit message received from a subscriber unit requesting an allocation of uplink (UL) **bandwidth** in which to transmit a **bandwidth request**;

providing an allocation of UL **bandwidth** to the subscriber unit for enabling the subscriber unit to transmit the **bandwidth request** to the base station;

detecting the **bandwidth request** in the UL data received from the subscriber unit;

identifying in the **bandwidth request** a requested amount of UL **bandwidth** pertaining to one of a plurality of UL queues at the subscriber unit;

determining if the requested amount of **bandwidth** is available; and

allocating to the subscriber unit an UL **bandwidth** grant based on the requested amount of **bandwidth** and the **bandwidth** available for the UL data, the UL **bandwidth** grant being for distribution between one or more connections at the subscriber unit.

(*Id.* at col. 24, ll. 15–35).

The Court addresses arguments as to the construction of “bandwidth” and “bandwidth requests” separately.

a) “Bandwidth”

Alcatel-Lucent proposes that “bandwidth” be construed to mean “an amount of data that can be transmitted in a particular time period.” (Joint Notice 2). Alcatel-Lucent argues this

proposed construction is consistent with the claims language and is also supported by the specification, wherein bandwidth request messages pertain to specific amounts of data (measured in number of bytes) (*see* Alcatel-Lucent Opening 6–7), and base stations allocate bandwidth to particular downlink or uplink sub-frames, which are time periods in which downlink and uplink data, respectively, are transmitted (*see* Alcatel-Lucent Resp. 2). In addition, Alcatel-Lucent claims its proposed construction is supported by definitions provided in contemporaneous technical dictionaries and treatises. (*See* Alcatel-Lucent Opening 7–8). Alcatel-Lucent also supports its proposed construction with expert testimony that one of ordinary skill in the art would understand that bandwidth, in the digital context, “generally refers to a capacity to transmit data, expressed as an amount of data that can be transmitted in a particular period of time.” (Lanning Decl. 5–6 [ECF No. 123-1]).

Wi-LAN proposes that “bandwidth” be broadly construed to mean “data transmission resources.” (Joint Notice 2). In support of its proposed construction, Wi-LAN notes that the specification refers to bandwidth in the form of bytes, which is a combination of eight bits and is unrelated to a particular time. (*See* Wi-LAN Opening 7). Wi-LAN also relies on dictionary definitions and other extrinsic evidence in the field of wireless networks that Wi-LAN claims support a broad construction of bandwidth. (*See id.* 7; Wi-LAN Resp. 3). Like Alcatel-Lucent, Wi-LAN also presents expert testimony to support its proposed construction that one of ordinary skill in the art would understand bandwidth to broadly mean “data transmission resource.” (Min Decl. 5–6 [ECF No. 98-1]). Wi-LAN’s primary criticism of Alcatel-Lucent’s proposed construction is the phrase “in a particular time period.” (Wi-LAN Resp. 1–3). Wi-LAN argues this phrase limits the patented invention to a time-division duplex (“TDD”) embodiment, where the uplink and downlink transmissions between the base station and subscriber unit do not run

concurrently, but rather are separated by periods of time. (*See id.*). According to Wi-LAN, this limitation is improper because the specification discusses other embodiments, namely a frequency division duplexing (“FDD”) scheme, where uplink and downlink data can be transmitted at the same time because the two directions of communication are separated by frequencies. (*See id.* 2).

Based on the language in the claims and an exhaustive review of the specification, the Court accepts Alcatel-Lucent’s proposed construction and concludes that “bandwidth” means “an amount of data that can be transmitted in a particular time period.” To begin, this construction is supported by the language in the claims. In the claims, bandwidth is being requested by subscriber units, measured for its availability by the base station, and allocated for distribution (based on demand and availability) to connections established at the subscriber unit. (*See, e.g.*, ’298 patent, Claim 1, col. 23, ll. 10–29; *see also* ’014 patent, Claim 2, col. 23, ll. 29–31 (“the granted amount of UL bandwidth is equal to the requested amount of UL bandwidth.”)). Alcatel-Lucent’s proposed construction recognizes that all of these various uses of “bandwidth” inherently involve elements of quantity⁶ and time. Indeed, if bandwidth was an ambiguous “data transmission resource” that was always available in unlimited amounts, there would be little need for the patented invention. Alcatel-Lucent’s proposed construction is also consistent with the clear guidance of the specification.

⁶ Wi-LAN’s expert agrees that bandwidth, as used in the claims, must be quantifiable. (*See* Aug. 9, 2013 Hr’g Tr. 218:13–220:5 [ECF No. 132]). The specification likewise supports Alcatel-Lucent’s proposed construction that bandwidth refers to an amount of data. In its description of the polling technique employed by the present invention, the specification states, “if the selected CPE does not require more bandwidth, it returns a request for zero bytes.” (’298 patent, col. 12, ll. 26–28). Similarly, when describing the piggybacking technique for requesting bandwidth, the specification states that the CPE employs “previously unused portions of uplink bandwidth that is already allocated to the CPE.” (*Id.* at col. 10, ll. 31–32).

The crux of Wi-LAN's argument in opposition to bandwidth being construed to mean "an amount of data that can be transmitted in a particular time period," is that the final phrase, "in a particular time period," would limit bandwidth to a TDD embodiment and exclude the FDD embodiment disclosed in the specification. Wi-LAN relies on the general claim construction principle that claim terms should not be construed in a way that excludes embodiments disclosed in the specification. (See Wi-LAN Resp. 2 (citing *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) and *Vitronics Corp.*, 90 F.3d at 1583)).

This general rule of claim construction is inapplicable in this instance. Unlike, for example, in *Oatey*, where the specification included a figure drawing that was improperly excluded from the claim terms, see 514 F.3d at 1276–77, the only FDD "embodiments" that Wi-LAN is able to cite to in the specification are two cursory references to "FDD" appearing in column 1 of the patents, under the heading, "Description of Related Art." (See Wi-LAN Resp. 2 (citing '298 patent, col. 1, ll. 52–59); Min Decl. 6 (citing '298 patent, col. 1, ll. 52–59); Aug. 9, 2013 Hr'g Tr. 181:10–16; *id.* at 229:8–230:6). This portion of the specification states, "[d]epending upon the design criteria of a given system, the prior art wireless communication systems have typically used either time division duplexing (TDD) or frequency division duplexing (FDD) methods to facilitate the exchange of information between the base station and the subscriber units. Both the TDD and FDD duplexing schemes are well known in the art." ('298 patent, col. 1, ll. 52–58). After this reference, the FDD scheme is never mentioned again in the specification, let alone in relation to, or as an embodiment of, the patented invention.

In *Wang Labs, Inc. v. America Online, Inc.*, 197 F.3d 1377, 1382 (Fed. Cir. 1999), the Federal Circuit declined to hold that a similar cursory and unrelated reference to an alternative embodiment was a basis to enlarge the invention described in the patent. The Federal Circuit

concluded that a reference to non-character based protocols in the “Background of the Invention” statement did “not describe them as included in the applicant’s invention, and [] the specification would not be so understood by a person skilled in the field of the invention.” *Id.* Likewise, the Court finds that a person of skill in the art would not consider FDD to be included in the patented invention based on the patentee’s mere acknowledgment that FDD systems existed at that time, without any further discussion of the matter.⁷

The Court also determines that adopting Alcatel-Lucent’s proposed construction is an appropriate exception to the general claim construction principle that limitations from the specification should not be imported to the claims. As noted in *Phillips*, “[m]uch of the time, upon reading the specification . . . it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive.” 415 F.3d at 1323. An examination of the specification of the ’298 and ’014 patents reveals the sole and extensive focus of the patentee in utilizing a TDD scheme in every aspect of the patented invention — from bandwidth allocation in the uplink and downlink sub-frame maps, to

⁷ In other cases applying this claim construction principle, the court similarly required more than a cursory and unrelated reference to an alternative embodiment. See *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007) (rejecting a proposed claim interpretation that would exclude “several examples in the specification where ‘destination address’ is a telephone number only, and thus not a point in the internet” (citation omitted)); *On-Line Tech. v. Bodenseewerk Perkin-Elmer*, 386 F.3d 1133, 1138 (Fed. Cir. 2004) (finding district court’s claim construction erroneously excluded a toroidal shape where “the reference to the preferred embodiment as having mirrors with toroidal surfaces would give rise to a very strong inference that the claim should be construed to include such surfaces”); *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1369 (Fed. Cir. 2003) (finding district court’s claim construction erroneously excluded an embodiment described in an example in the specification, where the prosecution history showed no such disavowal of claim scope).

bandwidth request techniques such as polling and piggybacking — and demonstrates that a TDD scheme is more than simply a “preferred embodiment” of the claim.⁸

The specification initially introduces and lays the groundwork for incorporating the TDD scheme into the patented invention during its discussion of broadband wireless communication systems. In reference to Figure 1, which shows an exemplary broadband wireless communication system adapted for use with the patented invention (*see* ’298 patent, col. 5, ll. 14–15), the specification states, “[t]he base station is the only transmitter operating in the downlink direction, hence it transmits without having to coordinate with other base stations, except for the overall time-division duplexing that divides time into upstream (uplink) and downstream (downlink) transmission periods” (*id.* at col. 6, ll. 42–47).

The specification proceeds to discuss and incorporate the TDD scheme in more detail in relation to bandwidth allocation and the invention’s use of uplink and downlink sub-frame mapping. To start, the specification incorporates prior art relating to a TDD scheme, stating, “[i]n one preferred embodiment of the present invention, the base stations [] maintain sub-frame maps of the bandwidth allocated to the uplink and downlink communication links. As described in U.S. Pat. No. 6,016,311, by Gilbert et al., . . . the uplink and downlink are preferably multiplexed in a time-division duplex (or ‘TDD’) manner.” (*Id.* at col. 7, ll. 14–22). United States Patent No. 6,016,311 (“the ’311 patent”), is titled “Adaptive Time Division Duplexing

⁸ In similar instances, the Federal Circuit has found an exception to this general claim construction principle and limited claim terms in light of the specification. *See Wang Labs., Inc.*, 197 F.3d at 1383 (limiting the claim term “frame” to character-based systems where that was the only embodiment described in the patent specification); *Scimed Life Sys., Inc. v. Advanced Cardiovascular Sys. Inc.*, 242 F.3d 1337, 1341 (Fed. Cir. 2001) (“Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question.”); *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1301–02 (Fed. Cir. 1999) (construing the term “including” in the asserted claims as requiring that the restriction ring be attached to the cover, where the specification and drawings showed the ring as part of and permanently attached to the cover, and did not illustrate or describe any other structure).

Method and Apparatus for Dynamic Bandwidth Allocation Within A Wireless Communication System.” Notably, the ’311 patent teaches away from using frequency bandwidth allocations because, *inter alia*, in FDD, the “bandwidth allocation schemes needed to provide a given service are made more complex and therefore more costly than those used by TDD systems,” and “FDD systems have limited flexibility and limited available frequency spectrum which is especially disadvantageous in broadband wireless communication systems.” (’311 patent, col. 2, ll. 7–9, 16–19). Instead, the ’311 patent takes the typical TDD scheme, which uses a symmetric allocation of uplink and downlink transmissions (*see id.* at col. 6, ll. 45–46), and adapts it to where time slots are flexibly and dynamically allocated for either uplink or downlink transmissions in response to the changing bandwidth needs of the communication link (*see id.* at col. 4, ll. 42–45).

After incorporating the prior art pertaining to the TDD scheme, the specification of the ’298 and ’014 patents discusses Figure 2, “a TDD frame and multi-frame structure [] that can be used by a communication system . . . in practicing the present invention.” (’298 patent, col. 7, ll. 34–36). The specification describes how “the TDD frame” shown in Figure 2 “is subdivided into a plurality of physical slots (PS) []. In the embodiment shown in FIG. 2, the frame is one millisecond in duration and includes 800 physical slots.” (*Id.* at col. 7, ll. 37–40). Bandwidth is allocated by the base station “in units of a certain pre-defined number of PSs.” (*Id.* at col. 7, ll. 42–43). Invoking the adaptive TDD concept from the ’311 patent, the specification states, “[t]he present bandwidth allocation method and apparatus can be used in both adaptive and fixed TDD systems using a frame and multi-frame structure similar to that shown in FIG. 2.” (*Id.* at col. 7, ll. 57–60).

In its discussion of uplink and downlink sub-frame mapping and Figure 2 in particular, the patentee uses broadening language such as “preferred embodiment” and “can be used.” This, however, does not in and of itself broaden the claims beyond their support in the specification.” *Wang Labs. Inc.*, 197 F.3d at 1383. “Whether an invention is fairly claimed more broadly than the ‘preferred embodiment’ in the specification is a question specific to the content of the specification, [and] the context in which the embodiment is described” *Id.* In the context of sub-frame mapping and Figure 2, the broadening language is focused on achieving flexibility with regard to the number and duration of the TDD frames and physical slots. The specification states, for example, that “[a]lternatively, the present invention can be used with frames having longer or shorter duration and with more or fewer PSs,” and “in one embodiment . . . the TDD framing is adaptive. That is, the number of PSs allocated to the downlink versus the uplink varies over time.” (’298 patent, col. 7, ll. 40–42, 53–57). The patentee does not similarly apply broadening language in regard to using an alternative to the TDD embodiment itself. Rather, the patentee continues to invoke and rely on these same TDD concepts of uplink and downlink sub-frame maps, frames, and physical slots (PSs), throughout the remainder of the specification and in a variety of contexts. The Court recaps some of these invocations below.

Detailed Discussion Regarding the Downlink and Uplink Sub-Frame Maps: The specification continues the discussion of downlink and uplink sub-frame maps in more detail in columns 8 and 9 of the specification, and includes examples of these maps in Figures 3 and 4. Again, this disclosure only relates to a TDD scheme. In particular, the specification describes how the “downlink sub-frame [] preferably comprises a frame control header [], [and] a plurality of downlink data PSs [] grouped by modulation type” (*Id.* at col. 8, ll. 11–13 (emphasis added)). In reference to Figure 3, the specification states “the Tx/Rx transition gap [] separates

the downlink sub-frame from the uplink sub-frame” (*Id.* at col. 8, ll. 38–40 (emphasis added)). Similarly, when bandwidth is allocated to a CPE in the uplink sub-frame map, as shown in Figure 4, the specification states, “[a]ll of the bandwidth allocated to a selected CPE *within a given TDD frame (or alternatively an adaptive TDD frame, as the case may be)* is grouped into a contiguous CPE scheduled data block []. The *physical slots* allocated for the CTGs [CPE transition gaps] [] are included in the bandwidth allocation to a selected CPE [] in the base station uplink sub-frame map.” (*Id.* at col. 9, ll. 21–27 (emphasis added)).

Bandwidth Allocation: The specification also describes the bandwidth allocation algorithm employed by the patented invention in terms of a TDD scheme. The specification states, “[f]or each TDD frame, the base station allocates *the downlink portion of the TDD frame* and it performs an estimate of the uplink traffic to allocate uplink bandwidth to the CPEs.” (*Id.* at col. 21, ll. 1–3 (emphasis added)). Similarly, with regard to uplink bandwidth allocation, the specification states, “*for each TDD frame, the CPEs are allocated a portion of the uplink sub-frame in which to transmit their respective data.*” (*Id.* at col. 21, ll. 65–67 (emphasis added)). Furthermore, “[a]s the queued data is transmitted, there may be a QoS queue for which there is insufficient bandwidth to transmit all queued data during the *current TDD frame*. When this situation occurs, a QoS specific fairness algorithm is initiated Continuous Grant queues have the simplest fairness algorithm. All data in these queues must be sent *every TDD frame.*” (*Id.* at col. 19, ll. 49–53, 60–62 (emphasis added)).

Bandwidth Requests: In accordance with the piggybacking technique for requesting bandwidth, the specification states that “the CPE ‘steals’ bandwidth already allocated for a data connection by inserting bandwidth requests *in time slots* previously used for data.” (*Id.* at col. 10, ll. 36–38 (emphasis added)). In accordance with the polling process, the specification

describes that a “CPE is allocated bandwidth in the uplink sub-frame map that is sufficient to allow the CPE to respond with the bandwidth request. Specifically, the base station allocates bandwidth in the *CPE scheduled data block*,” and refers to Figure 4, which, as previously discussed, relates to a TDD scheme. (*Id.* at col. 12, ll. 20–24 (emphasis added)).

Contention Resolution Process: The specification also has a section titled “Contention Resolution Process,” which describes how “[c]ontention is necessary when there is insufficient time to poll all of the CPEs individually within a suitable interval. . . . After CPE scheduled data, control messages, and polling are allowed for, the base station allocates *all unused time in the upstream part of the TDD frame* to contention, either for bandwidth requests or for registration purposes.” (*Id.* at col. 16, ll. 1–9 (emphasis added)).

In sum, this is not a case of limiting the claims to a preferred embodiment of an invention that has been more broadly disclosed in the specification. The specification of the ’298 and ’014 patents does not contemplate using frequency bandwidth allocations or consider how any of the aforementioned aspects of the patented invention could/would be implemented in an alternative FDD scheme. This is also not a case of construing the claims to exclude an embodiment disclosed in the specification, as the FDD scheme is only cursorily mentioned with respect to the description of related art and never thereafter incorporated into the patented invention. The definition of bandwidth proposed by Alcatel-Lucent stays true to the claim language and most naturally aligns with the description of the invention. Wi-LAN’s definition, conversely, fails to provide any substantive meaning to the claim terms and, in light of the specification, is impermissibly broad.

The intrinsic evidence leaves no genuine ambiguity necessitating reference to extrinsic evidence. *See Vitronics Corp.*, 90 F.3d at 1583. Accordingly, the Court construes “bandwidth” to mean “an amount of data that can be transmitted in a particular time period.”

b) “Bandwidth request”

Wi-LAN proposes that “bandwidth request” be construed to mean “request for bandwidth.” (Joint Notice 2). In support of its construction, Wi-LAN argues that “request” is commonly used in many communication protocols and one of ordinary skill in the art would understand the term refers to “half of a communications protocol, in which one entity requests resources and the entity receiving the request grants resources.” (Wi-LAN Opening 8). Alcatel-Lucent argues that “bandwidth request” has a particular meaning as used in the ’298 and ’014 patents that is not reflected in Wi-LAN’s proposed construction. (*See* Alcatel-Lucent Resp. 3–4). Alcatel-Lucent proposes that “bandwidth request” means “a request for permission to transmit an amount of data that can be transmitted in a particular time period.” (Joint Notice 2).

Wi-LAN’s proposed definition of “bandwidth request” as a “request for bandwidth” is merely a reorganization of the claim terms and is broader than specifically allowed in light of the disclosures. According to the relevant portions of the specification, which Wi-LAN itself cites (*see* Wi-LAN Opening 8), “[t]he base stations [] receive *requests for transmission rights* and *grant* these requests within the time available taking into account the priorities, service types, quality of service and other factors associated with the CPEs.” (’298 patent, col. 6, ll. 7–11 (emphasis added)). The specification also states, “[t]he CPEs [] share the uplink on a demand basis that is controlled by the base station MAC. Depending upon the class of service utilized by a CPE, the base station may *issue* a selected CPE continuing *rights to transmit* on the uplink, or the *right to transmit* may be *granted* by a base station *after receipt of a request* from the CPE.”

(*Id.* at col. 6, ll. 51–56 (emphasis added)). Alcatel-Lucent’s proposed construction that “bandwidth request” is a “request for permission to transmit . . .” is consistent with the specification’s disclosure of base stations issuing/granting transmission rights and is accepted by the Court.

2. “*Explicit Message*” / “*Explicit message received from [a/the] subscriber unit*”

The parties dispute the proper construction of the phrase “explicit message” and the broader phrase “explicit message received from [a/the] subscriber unit,” that appear in Claim 2 of the ’298 patent and Claim 6 of the ’014 patent. These claims, with the disputed phrases in bold, are as follows:

Claim 2: A base station as claimed in claim 1, wherein upon identification of an **explicit message received from the subscriber unit**, the base station responds by providing the subscriber unit with an allocation of UL bandwidth for enabling the subscriber unit to transmit the bandwidth request to the base station.

(’298 patent, col. 23, ll. 30–35).

Claim 6: A method of allocating bandwidth to subscriber units from a base station operating in a wireless communication system, comprising:

identifying an **explicit message received from a subscriber unit** requesting an allocation of uplink (UL) bandwidth in which to transmit a bandwidth request;

providing an allocation of UL bandwidth to the subscriber unit for enabling the subscriber unit to transmit the bandwidth request to the base station;

detecting the bandwidth request in the UL data received from the subscriber unit;

identifying in the bandwidth request a requested amount of UL bandwidth pertaining to one of a plurality of UL queues at the subscriber unit;

determining if the requested amount of bandwidth is available; and

allocating to the subscriber unit an UL bandwidth grant based on the requested amount of bandwidth and the bandwidth available for the UL data, the UL bandwidth grant being for distribution between one or more connections at the subscriber unit.

'014 patent, col. 24, ll. 15–35).

Wi-LAN's proposed construction for "explicit message" and "explicit message . . ." is "an alert from a subscriber unit indicating to the base station that the subscriber unit needs to be polled specifically for the purpose of making a bandwidth request." (Joint Notice 2). In support of its construction, Wi-LAN cites to portions of the specification that explain how, in accordance with the polling technique taught by the patented invention, the base station allocates bandwidth to selected CPEs specifically for the purpose of making bandwidth requests. (*See* Wi-LAN Opening 9–10). Wi-LAN also cites to the prosecution history of the parent application to the '014 patent, United States Patent Application Number 12/645,937 ("the '937 patent"), wherein the patent examiner⁹ described an "explicit message" as an "alert[]/message[]" [to] the network that it wants to request bandwidth (or a change to its current bandwidth)" that could be "similar to 'PLEASE POLL ME.'" (Wi-LAN Opening 10–11; *id.*, Ex. G at 3 [ECF No. 91-7]).

Alcatel-Lucent's proposed construction of "explicit message" and "explicit message . . ." is "a request for bandwidth in which to transmit a bandwidth request." (Joint Notice 2). In support of its construction and use of the term "request," Alcatel-Lucent points to language in the specification describing how only inactive CPEs and active CPEs that explicitly request to be polled by setting their poll-me bits, are eligible for individual polling and can thereby submit a request for more bandwidth. (*See* Alcatel-Lucent Opening 10). Alcatel-Lucent argues that, contrary to Wi-LAN's proposed construction, the concept of an alert is not found in the patents' claims or specification. (*See id.*). In an attempt to undermine Wi-LAN's reliance on the

⁹ Patent examiners are presumed to be persons of ordinary skill in the art in the relevant technical field. *See In re Berg*, 320 F.3d 1310, 1315 (Fed. Cir. 2003) ("As persons of scientific competence in the fields in which they work, examiners and administrative patent judges on the Board are responsible for making findings, informed by their scientific knowledge, as to the meaning of prior art references to persons of ordinary skill in the art . . .").

prosecution history of the '937 patent for this point, Alcatel-Lucent notes that in Wi-LAN's response to the PTO examiner's non-final rejection, Wi-LAN disagreed with the examiner's statement in the office action that the examiner's proffered interpretation of the claims was essential and submitted that the examiner's interpretation was incorrect. (*See* Alcatel-Lucent Resp. 7; *id.*, Ex. 2 at 6 [ECF No. 97-3]).

Wi-LAN's proposed construction more accurately reflects the intrinsic record of the '298 and '014 patents.¹⁰ The parties agree that the ultimate goal of the "explicit message" is for a subscriber unit to make a bandwidth request to the base station. As is apparent in its proposed construction, Alcatel-Lucent agrees that in order for the subscriber unit to transmit this request, the base station must first allocate some bandwidth to the subscriber unit. "Polling" is the precise method repeatedly identified in the specification whereby a base station allocates a sufficient amount of bandwidth to a CPE for the purpose of allowing the CPE to transmit its bandwidth request. (*See* '298 patent, Abstract ("One technique includes a 'polling' method whereby a base station polls CPEs individually or in groups and allocates bandwidth specifically for the purpose of allowing the CPEs to respond with bandwidth requests."); *id.* at col. 4, ll. 1–6; *id.* at col. 11, l. 62–col. 12, l. 3; *see also* Alcatel-Lucent Opening 10 (citing, in support of its proposed construction of "explicit message," portions of the specification that explicitly refer to the polling process and CPEs setting their "poll-me" bits)). Thus, although Alcatel-Lucent's proposed construction does not use the term "poll" or "polling," this is the method its proposed construction is precisely referring to, yet which is notably absent therein.

It is also clear from the specification, and noted by Alcatel-Lucent in its claim construction brief, that "only inactive CPEs and active CPEs that *explicitly request* to be polled

¹⁰In the Joint Notice, Wi-LAN proposes a compromise construction, "a request sent specifically for the purpose of transmitting a subsequent bandwidth request." (Joint Notice 2). For the reasons explained, the Court adopts Wi-LAN's original proposed construction.

are eligible for individual polling.” (’298 patent, col. 12, ll. 31–35 (emphasis added); *see* Alcatel-Lucent Opening 10). The material difference between the parties’ respective constructions is whether this “explicit request” is more akin to an “alert,” as proposed by Wi-LAN, or a “request,” as proposed by Alcatel-Lucent. Wi-LAN’s proffered construction is more aligned with claims of the ’298 and ’014 patents, as well as the patents’ specification.

To begin with, Alcatel-Lucent’s proposed use of “request” does not explain the patentee’s specific choice and use of the word “explicit” in Claim 2 of the ’298 patent and Claim 6 of the ’014 patent. If “explicit message” was actually just a “request for bandwidth in which to transmit a bandwidth request,” the patentee could simply have used the word “message” alone to convey this point. For example, Claim 2 of the ’298 patent could have been written, “[a] base station . . . wherein upon identification of a *message for bandwidth in which to transmit a bandwidth request* received from the subscriber unit, the base station responds” Similarly, with regard to the description of the invention in the specification, the patentee could have used the word “request” rather than “explicitly request.” (’298 patent, col. 12, ll. 31–33). The patentee’s choice of “explicit” to describe “message” and “request” is rendered mere surplusage in Alcatel-Lucent’s proposed construction, and accorded zero weight or relevance. Wi-LAN’s proposed construction, in contrast, recognizes that the patentee’s use of “explicit” in conjunction with “message” and “request,” implies that message/request does not inherently mean a message/request that is explicit. *See Phillips*, 415 F.3d at 1314 (“[T]he context in which a term is used in the asserted claim can be highly instructive. To take a simple example, the claim in this case refers to ‘steel baffles,’ which strongly implies that the term ‘baffles’ does not inherently mean objects made of steel.”).

Wi-LAN's proposed construction of the "explicit message" as an "alert" is also supported by the specification's description of the process by which a CPE indicates to the base station that it needs bandwidth in which to make a bandwidth request. The specification discloses that an active CPE in need of bandwidth relays an explicit message to the base station only after the CPE has exhausted the piggybacking technique, and thus has no previously allocated bandwidth on which to make or tack on its bandwidth request. (*See* '298 patent, col. 17, ll. 38–56; *id.* at col. 4, ll. 22–33; *id.* at Fig. 9). With no other means of communicating its request, the CPE "sets a 'poll-me' bit or a 'priority poll-me' in a MAC packet in order to indicate to the base station that it requires a change in bandwidth allocation." (*Id.* at col. 17, ll. 19–21). "Active CPEs that do not set their respective 'poll-me' bits in the MAC packet header will not be polled individually." (*Id.* at col. 12, ll. 33–35). The "poll-me bits," or the "explicit message," thus act as a flag, or an alert, set by the CPE to stimulate a response (polling) from the base station. Wi-LAN's proposed construction accurately reflects the process described in the specification of the '298 and '014 patents. Conversely, Alcatel-Lucent's characterization of the "explicit message" as a request from the subscriber unit to the base station for bandwidth in which to transmit a bandwidth request is inaccurate and impermissibly broad.

Accordingly, the Court adopts Wi-LAN's construction of the "explicit message" as "an alert from a subscriber unit indicating to the base station that the subscriber unit needs to be polled specifically for the purpose of making a bandwidth request."¹¹

¹¹ In light of the clear guidance provided by the claims and specification of the '298 and '014 patents, the Court is not persuaded that Wi-LAN's response to the June 20, 2012 office action during the prosecution of the '937 patent dictates a different result. (*See* Alcatel-Lucent Resp., Ex. 2 at 6–7; Wi-LAN Opening, Ex. G at 3–4). In its response to the office action, Wi-LAN does not specifically dispute the PTO examiner's characterization of the explicit message as a flag or an alert. (*See* Alcatel-Lucent Resp., Ex. 2 at 6–7). Rather, Wi-LAN's remarks reflect a desire to preserve as broad a scope as possible for the claims in question. (*See id.*)

3. *“Uplink (UL) queue” / “Pertaining to a UL queue established at the subscriber unit” / “Pertaining to one of a plurality of UL queues at the subscriber unit”*

The parties dispute the proper construction of the phrase “uplink (UL) queue,” and the broader phrase, “pertaining to a UL queue established at the subscriber unit,” in Claim 1 and Claim 7 of the ’298 patent, and “pertaining to one of a plurality of UL queues at the subscriber unit” in Claim 6 of the ’014 Patent (collectively, the “‘pertaining to’ phrases”).

Claims 1 and 7 of the ’298 patent, with the disputed phrase “UL queue” in bold and underlined, and the disputed “pertaining to” phrases in bold, are as follows:

Claim 1: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a bandwidth request in uplink (UL) data received from a subscriber unit and identify in the bandwidth request a requested amount of UL bandwidth **pertaining to a UL queue established at the subscriber unit;**

determine if the requested amount of bandwidth is available; and

allocate to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data, wherein the UL bandwidth grant is allocated to the subscriber unit for distribution, without any control from the base station, between the connections established at the subscriber unit.

(’298 patent, col. 23, ll. 10–29).

Claim 7: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units;

a receiver for receiving uplink (UL) traffic from the subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a bandwidth request in UL data received from a subscriber unit and identify in the bandwidth request a requested amount of UL bandwidth **pertaining to a UL queue established at the subscriber unit;**

determine if the requested amount of bandwidth is available;

allocate to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data, wherein the UL bandwidth grant is allocated to the subscriber unit for distribution between the connections established at the subscriber unit, without any control from the base station; and

a memory for storing a logical view of **UL queues** maintained by the subscriber unit, the queues being maintained based on the bandwidth requests received from the subscriber unit.

(*Id.* at col. 23, l. 49–col. 24, l. 6).

Claim 6 of the '014 patent, with the disputed phrase “UL queue” in bold and underlined, and the disputed “pertaining to” phrase in bold, states:

Claim 6: A method of allocating bandwidth to subscriber units from a base station operating in a wireless communication system, comprising:

identifying an explicit message received from a subscriber unit requesting an allocation of uplink (UL) bandwidth in which to transmit a bandwidth request;

providing an allocation of UL bandwidth to the subscriber unit for enabling the subscriber unit to transmit the bandwidth request to the base station;

detecting the bandwidth request in the UL data received from the subscriber unit;

identifying in the bandwidth request a requested amount of UL bandwidth **pertaining to one of a plurality of UL queues at the subscriber unit;**

determining if the requested amount of bandwidth is available; and

allocating to the subscriber unit an UL bandwidth grant based on the requested amount of bandwidth and the bandwidth available for the UL data, the UL bandwidth grant being for distribution between one or more connections at the subscriber unit.

('014 patent, col. 24, ll. 15–35).

Wi-LAN's proposed construction for "uplink queue" is "a collection of uplink data with quality of service (QoS) requirements." (Joint Notice 2). Wi-LAN asserts that no separate construction is necessary for the "pertaining to" phrases. (*See id.* at 2–3). Alcatel-Lucent's proposed construction for "uplink queue" is "a structure containing data to be transmitted relating to a particular QoS level," and its proposed construction for the "pertaining to" phrases is "for a structure containing data to be transmitted relating to a particular QoS level." (*Id.* at 2–3). Based on their proposed constructions, the parties agree that a subscriber unit's "uplink queue" relates to quality of service. The primary point of contention is whether an uplink queue relates to a particular quality of service level, as Alcatel-Lucent proposes, or if the queue can consist of multiple quality of service requirements, as Wi-LAN proposes.

The specification of the '298 and '014 patents, which refers to "quality of service (QoS) queues" in the context of allocating bandwidth and data transmission, supports Alcatel-Lucent's proposed construction that "uplink queues" must relate to a particular quality of service level. With respect to the downlink bandwidth, the specification describes how the base station media access control "maintains a set of queues for each physical channel that it serves" and "[w]ithin each physical channel queue set, the base station maintains *a queue for each QoS*" that holds data ready to be transmitted to the CPE. ('298 patent, col. 18, ll. 45–49 (emphasis added); *see also id.* at col. 4, ll. 54–57). The accompanying Figure 12, which "shows the downlink bandwidth allocation method used by the present invention" (*id.* at col. 5, ll. 42–43), also separates the queues by quality of service requirements, labeling the queues as "QoS 1," "QoS 2," . . . and "QoS n" (*id.* at Fig. 12). Uplink bandwidth allocation, according to the specification, "is very similar to the downlink bandwidth allocation method," except that "rather than being maintained by the base station, the data queues are distributed across and maintained by each

individual CPE.” (*Id.* at col. 19, ll. 9–13; *id.* at col 5, ll. 4–7). Indeed, Figure 13, which “shows the uplink bandwidth allocation method used by the present invention” (*id.* at col. 5, ll. 44–45), also separates the queues by quality of service requirements, labeling the queues as “QoS 1,” “QoS 2,” . . . and “QoS n” (*id.* at Fig. 13). Finally, the specification describes situations in which “there may be a *QoS queue* for which there is insufficient bandwidth to transmit all queued data.” (*Id.* at col. 19, ll. 49–51 (emphasis added)). When this occurs, “a QoS specific fairness algorithm is initiated to ensure fair handling of the data *queued at that QoS.*” (*Id.* at col. 19, ll. 51–54 (emphasis added)). As illustrated by these disclosures, the patented invention employs separate queues for different quality of service levels.

Despite the foregoing evidence to the contrary, Wi-LAN argues that data in a given queue can consist of multiple quality of service requirements. In support of its construction, Wi-LAN cites to a passage in the specification as evidence that data in a given queue may be differentiated in terms of “multiple QoS parameters, such as the amount of data pending in the queue from the individual data connections, and the guaranteed rates and the average rates of transmission bandwidth allocated to the individual data connections.” (Wi-LAN Opening 12 (citing ’298 patent, col. 19, l. 64–col. 20, l. 37)).

The cited portion of the specification does not support Wi-LAN’s construction. The cited portion falls under a category titled, “*QoS Specific Fairness Algorithms*” (’298 patent, col. 19, l. 45 (emphasis added)), and the parameters by which data in a specific quality of service queue may be differentiated are then explicitly identified in the specification as “data rate parameters” (*id.* at col. 20, ll. 1–5), not quality of service parameters. In particular, according to the specification, data in a given uplink queue may be differentiated based on data rate parameters when there is “a QoS queue for which there is insufficient bandwidth to transmit all queued data

during the current TDD frame. When this situation occurs, a QoS specific fairness algorithm is initiated to ensure fair handling of the data queued *at that QoS*.” (*Id.* at col. 19, ll. 49–54 (emphasis added)). One of the algorithms identified in the specification and relied on by Wi-LAN in support of its construction, fair-weighted queuing, “requires that all connections *at a given QoS* have a weight, assigned to them to determine the percentage of the available bandwidth they are eligible to receive,” and specifies “[t]his weight value is preferably derived from one of three *data rate parameters*, (1) Data Pending; (2) Guaranteed Rate; and (3) Average Rate.” (*Id.* at col. 19, l. 65–col. 20, l. 5 (emphasis added)). While this fairness algorithm supports the idea that, within a single quality of service queue, there may be multiple data rate parameters on which to assign weight to the queue’s connections, it does not support Wi-LAN’s position that there are multiple quality of service requirements within each uplink queue.

A secondary point of contention between the parties is whether the uplink queue is “a collection of uplink data,” as proposed by Wi-LAN, or “a structure containing data,” as proposed by Alcatel-Lucent. On this point, Wi-LAN notes that neither “collection” nor “structure” is used in the specification with respect to the term “queue,” but it simply states that collection is more consistent with the queue-specific fairness algorithms that can take place if there is not enough bandwidth to satisfy a particular uplink queue. (*See* Wi-LAN Resp. 6, n. 7). In support of its construction, Alcatel-Lucent cites to the specification, which discloses how, in relation to downlink bandwidth allocation, “[t]he queues *hold data* that is ready to be transmitted” from the base station to the CPEs. (Alcatel-Lucent Opening 9 (citing ’298 patent, col. 18, ll. 48–49) (emphasis added)). Alcatel-Lucent also relies on extrinsic evidence presented by its expert witness, Mark R. Lanning, and a dictionary definition. According to Mr. Lanning, “[t]he

specification's disclosure that 'queues hold data' . . . would indicate to one of ordinary skill in the art that the queues are structures containing data — rather than a collection of data — because a structure would be necessary to hold the data.” (Lanning Decl. 9). In particular, Mr. Lanning testified that a structure is required to hold data because, “[y]ou need to have the memory, plus you need to have the software that controls what's stored into the different parts of the memory and linking them together.” (Aug. 9, 2013 Hr'g Tr. 118:3–6). Alcatel-Lucent also relies on the Microsoft Computer Dictionary (4th ed. 1999), which defines “queue” as “a multi-element *data structure* from which (by strict definition) elements can be removed only in the same order in which they were inserted.” (Alcatel-Lucent Opening, Ex. 9 at 8 (emphasis added)).

The evidence presented by Alcatel-Lucent persuades the Court that “queue” is more appropriately construed as “a structure.” Based on the technical dictionary definition which was in existence as of the effective filing date of the '298 and '014 patents,¹² “queue” had an accepted meaning to those of skill in the art that connoted more order than simply an amorphous “collection” of data. *See Phillips*, 415 F.3d at 1318 (“Because dictionaries, and especially technical dictionaries, endeavor to collect the accepted meanings of terms used in various fields of science and technology, those resources have been properly recognized as among the many tools that can assist the court in determining the meaning of particular terminology to those of skill in the art of the invention.”). Furthermore, construing “queue” to be “a structure” is not incompatible with the implementation of queue-specific fairness algorithms, which are initiated only where there is insufficient bandwidth to transmit all queued data during a specific TDD frame. (*See* '298 patent, col. 19, ll. 49–51).

¹² Wi-LAN recognizes the relevance of this extrinsic evidence as it also cites to the Microsoft Computer Dictionary (4th ed. 1999) in support of its construction of “bandwidth.” (*See* Wi-LAN Opening, Ex. D [ECF No. 91-4]).

Accordingly, the Court concludes that “uplink (UL) queue” means “a structure containing data to be transmitted relating to a particular quality of service level,” and the “pertaining to” phrases to mean “for a structure containing data to be transmitted relating to a particular quality of service level.”

4. “*Connections [established] at the subscriber unit*” / “*Group of connections*”

The parties dispute the proper construction of the phrases “connections [established] at the subscriber unit,” and “group of connections,” and some of the broader phrases in which they appear: (1) “wherein the UL bandwidth grant is allocated to the subscriber unit for distribution, without any control from the base station, between the connections established at the subscriber unit,” in Claim 1 of the ’298 patent; (2) “within UL bandwidth specifically allocated to a group of connections for bandwidth requests,” in Claim 6 of the ’298 patent; (3) “wherein the UL bandwidth grant is allocated to the subscriber unit for distribution between the connections established at the subscriber unit, without any control from the base station,” in Claim 7 of the ’298 patent; and (4) “connections at the subscriber unit,” in Claim 6 of the ’014 patent.

Claims 1, 6, and 7 of the ’298 patent, with the disputed phrases “connections established at the subscriber unit” in bold and underlined, “group of connections” in bold and italics, and “wherein the UL bandwidth grant . . .” in bold, are as follows:

Claim 1: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a bandwidth request in uplink (UL) data received from a subscriber unit and identify in the bandwidth request a requested amount of UL bandwidth pertaining to a UL queue established at the subscriber unit;

determine if the requested amount of bandwidth is available; and

allocate to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data, **wherein the UL bandwidth grant is allocated to the subscriber unit for distribution, without any control from the base station, between the connections established at the subscriber unit.**

('298 patent, col. 23, ll. 10–29).

Claim 6: A base station as claimed in claim 1, wherein the bandwidth request is identified within UL bandwidth within UL bandwidth specifically allocated to a *group of connections* for bandwidth requests.

(*Id.* at col. 23, ll. 46–48).

Claim 7: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units;

a receiver for receiving uplink (UL) traffic from the subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a bandwidth request in UL data received from a subscriber unit and identify in the bandwidth request a requested amount of UL bandwidth pertaining to a UL queue established at the subscriber unit;

determine if the requested amount of bandwidth is available;

allocate to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data, **wherein the UL bandwidth grant is allocated to the subscriber unit for distribution between the connections established at the subscriber unit, without any control from the base station;** and

a memory for storing a logical view of UL queues maintained by the subscriber unit, the queues being maintained based on the bandwidth requests received from the subscriber unit.

(*Id.* at col. 23, l. 49–col. 24, l. 6).

Claim 6 of the '014 patent, with the disputed phrase “connections at the subscriber unit” in bold and underlined, reads as follows:

Claim 6: A method of allocating bandwidth to subscriber units from a base station operating in a wireless communication system, comprising:

identifying an explicit message received from a subscriber unit requesting an allocation of uplink (UL) bandwidth in which to transmit a bandwidth request;

providing an allocation of UL bandwidth to the subscriber unit for enabling the subscriber unit to transmit the bandwidth request to the base station;

detecting the bandwidth request in the UL data received from the subscriber unit;

identifying in the bandwidth request a requested amount of UL bandwidth pertaining to one of a plurality of UL queues at the subscriber unit;

determining if the requested amount of bandwidth is available; and

allocating to the subscriber unit an UL bandwidth grant based on the requested amount of bandwidth and the bandwidth available for the UL data, the UL bandwidth grant being for distribution between one or more **connections at the subscriber unit**.

('014 patent, col. 24, ll. 15–35).

The central term in these disputed phrases, and the crux of the dispute between the parties, is the word “connections.” Alcatel-Lucent proposes that the aforementioned uses of “connections” in the '298 and '014 patents lack a proper antecedent basis and the claims are thus invalid for indefiniteness. (*See* Alcatel-Lucent Opening 13–16). In particular, Alcatel-Lucent argues that “connections” could have two different meanings: the term could relate to services operating on a CPE, or it could refer to the relationship between a CPE and the base station. (*See id.* 15–16). Alcatel-Lucent also argues there is no explanation as to how “connections” relate to the uplink queues established at the subscriber unit. (*See id.* 14–15).

In defense of the claims, Wi-LAN argues that one of skill in the art can understand the use of “connections” when read in light of the specification. (*See* Wi-LAN Resp. 7–8). In

addition, Wi-LAN argues that one of skill in the art would understand that “‘queue’ and ‘connection’ refer to two different elements in the [bandwidth] request/grant scheme.” (*Id.* 8). According to Wi-LAN, uplink queues pertain to bandwidth requests sent by the subscriber unit to the base station, whereas connections come into play once the base station has allocated bandwidth to the subscriber unit, when the subscriber unit then distributes the bandwidth grant among its individual service connections. (*See id.*).

The written description of the specification is sufficient to inform one skilled in the art of the meaning of “connections” as that term appears in the disputed claims. Claims 1 and 7 of the ’298 patent and Claim 6 of the ’014 patent, all explicitly relate to the distribution of allocated bandwidth between “connections,” and clarify that the referenced connections are “at” or “established at” the level of the subscriber unit. (’298 patent, Claim 1, col. 23, ll. 28–29; *see id.* at Claim 7, col. 24, l. 1; ’014 patent, Claim 6, col. 24, l. 35). Although Claim 6 of the ’298 patent does not contain a similarly explicit description of its connections being at the subscriber unit, when read in light of the invoked Claim 1, this can reasonably be inferred.¹³ (*See* ’298 patent, col. 23, ll. 46–48). When the specification is examined, the antecedent basis for these “connections” is readily apparent. The specification repeatedly describes how, once bandwidth is allocated to a CPE, the CPE is responsible for distributing the allocated uplink bandwidth across the data services, or “connections,” provided by the CPE. The specification also describes how a CPE is free to distribute the bandwidth in a manner different from that originally requested from the base station.

For example, the specification discloses:

¹³ Wi-LAN’s expert, Dr. Paul Min, also testified that the “group of connections” described in Claim 6 of the ’298 patent was a reference to the “connections” discussed in lines 28–29 of Claim 1. (*See* Aug. 9, 2013 Hr’g Tr. 140:15–23).

The CPE is responsible for distributing the allocated uplink bandwidth in a manner that accommodates the services provided by the CPE. The CPE is free to use the uplink bandwidth that was allocated to it in a manner that is different than that originally requested or granted by the base station. The CPE advantageously determines which services to give bandwidth to and which services must wait for subsequent bandwidth requests.

(’298 patent, col. 4, ll. 34–41; *see also id.* at col. 10, ll. 41–46).

Starting at a point in the TDD, the uplink sub-frame map allocates a certain amount of bandwidth to the selected CPE. The selected CPE then allocates this bandwidth across its connections. This allows the CPE to use the bandwidth in a different manner than requested if it receives higher priority data while awaiting the bandwidth allocation.

(*Id.* at col. 19, ll. 26–31).

[T]he CPEs themselves are responsible for allocating their allotted bandwidth based upon their current bandwidth requirements. That is, the CPEs are not constrained to distribute allocated bandwidth to their data connections in the same manner that the CPE used in requesting the bandwidth from the base station.

(*Id.* at col. 22, ll. 3–8).

The CPE itself, rather than the base station, distributes the allocated bandwidth to its services in any manner the CPE determines to be appropriate. Thus, the CPE can use its allocated bandwidth in a manner that differs from the originally intended (and requested) purpose.

(*Id.* at col. 22, ll. 50–54). These repeated, and detailed, disclosures regarding bandwidth distribution at the level of the subscriber unit amongst its data connections leave no doubt that one of skill in the art could discern the meaning of “connections.”

The Court is not persuaded otherwise by Alcatel-Lucent’s argument that the use of “connections” is insolubly ambiguous because of uncertainty as to how connections relate to uplink queues. The plain language of Claims 1 and 7 of the ’298 patent and Claim 6 of the ’014 patent delineates the role of uplink queues and connections based on bandwidth requests and the distribution of allocated bandwidth, respectively. For example, according to the language in Claim 1 of the ’298 patent, the base station first “detect[s] a bandwidth request . . . pertaining to

a UL queue established at the subscriber unit.” (*Id.* at Claim 1, col. 23, ll. 17–20). Then the base station “determine[s] if the requested amount of bandwidth is available” and “allocate[s] to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data.” (*Id.* at col. 23, ll. 21–25). Once the bandwidth is allocated to the subscriber unit, the base station ceases to play a role with regard to the allocated bandwidth. At that point, the subscriber unit distributes the allocated bandwidth between its connections. (*See id.* at col. 23, ll. 25–29).¹⁴

In sum, the Court finds that Alcatel-Lucent has not met its burden of showing, by clear and convincing evidence, that the phrases, “connections [established] at the subscriber unit,” and “group of connections,” are insolubly ambiguous. *See Halliburton Energy Serv., Inc.*, 514 F.3d at 1249–50. These claims, “read in light of the specification reasonably apprise those skilled in the art of the scope of the invention” and “§ 112 demands no more.” *Personalized Media Commc’ns, LLC*, 161 F.3d at 705 (citation and internal quotation marks omitted). Furthermore, the Court does not need to provide any construction with regard to the broader contextual phrases, “wherein the UL bandwidth grant is allocated to the subscriber unit,” and “without any control from the base station,”¹⁵ in Claims 1 and 7 of the ’298 patent, as the parties have not

¹⁴ The expert testimony relied upon by the parties does not alter the Court’s conclusion that “connections” is not insolubly ambiguous. At the *Markman* hearing, both parties submitted expert testimony in support of their respective arguments regarding the definition of “connections” generally, as well as the relationship between “connections” and “queues.” Because the meanings of uplink queue and connections are unambiguously set forth in the claims and specification, the expert testimony cannot serve to inject ambiguity. *See Personalized Media Commc’ns, LLC*, 161 F.3d at 706 (“Extrinsic evidence may not be relied upon during claim construction when the intrinsic evidence unambiguously defines the disputed claim language.”).

¹⁵ At the *Markman* hearing, the alleged infringer, Alcatel-Lucent, itself noted there was “nothing ambiguous about the phrase, ‘without any control from [the] base station.’” (Aug. 9, 2013 Hr’g Tr. 156:23–157:6).

presented any evidence to indicate these phrases, separate and independent of “connections,” are insolubly ambiguous or in need of construction.

5. *“Broadband wireless communication system”*

The parties dispute whether the phrase “broadband wireless communication system,” found in the preamble to Claims 1 and 4 of the ’014 patent, should be construed as a limitation, and, if so, the proper construction it should receive. These claims, with the disputed phrase in bold, are as follows:

Claim 1: A base station for a **broadband wireless communication system**, comprising:

a transmitter system for transmitting downlink (DL) traffic to a plurality of subscriber units and a receiver for receiving uplink (UL) traffic from the plurality of subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a bandwidth (BW) request in the UL traffic received from a subscriber unit,

identify in the BW request a requested amount of UL bandwidth pertaining to a specified connection established at the subscriber unit,

determine if bandwidth is available for the subscriber unit, and then allocate to the subscriber unit a granted amount of UL bandwidth,

maintain an UL map with uplink bandwidth allocations,

dynamically update the UL map to account for the granted amount of UL bandwidth,

provide the updated UL map to the transmitter system for transmitting to plurality of subscriber units, and

indicate to the subscriber unit that the request has been granted by providing the granted amount of UL bandwidth to the subscriber unit.

(’014 patent, col. 23, ll. 5–28).

Claim 4: A base station for a **broadband wireless communication system** which transmits downlink (DL) traffic to subscriber units and receives uplink (UL) traffic from the subscriber units, the base station comprising:

an antenna system for transmitting downlink (DL) traffic to subscriber units and receiving uplink (UL) traffic from the subscriber units;

one or more processors having a media access control (MAC) module configured to

detect a bandwidth (BW) request in the UL traffic received from a subscriber unit,

identify in the BW request a requested amount of UL bandwidth pertaining to a specified connection established at the subscriber unit,

determine if bandwidth is available for the subscriber unit, and allocate to the subscriber unit a granted amount of UL bandwidth, if bandwidth is available for the subscriber unit,

maintain a DL map and an UL map with downlink and uplink bandwidth allocations respectively,

dynamically update the UL map to account for the granted amount of UL bandwidth, if the granted amount of UL bandwidth is granted, and

provide updated DL and UL maps to the antenna system for transmitting to the subscriber units.

(*Id.* at col. 23, l. 36–col. 24, l. 11).

According to Alcatel-Lucent, because “broadband wireless communication system” is expressly defined in the specification and provides necessary context for the elements of the claim, it should be construed despite being found in the claim preamble. (*See* Alcatel-Lucent Opening 17). Alcatel-Lucent proposes that “broadband wireless communication system” should be construed to mean “a communication system between a base station and fixed subscriber stations.” (Joint Notice 3). In support of its proposed construction, Alcatel-Lucent argues that the patentee, acting as his own lexicographer, expressly defined “‘broadband wireless communication system’ as a system that ‘facilitates two-way communication between a plurality

of base stations and a plurality of *fixed subscriber stations or Customer Premises Equipment (CPE)*.” (Alcatel-Lucent Opening 18 (emphasis in original) (quoting the ’014 patent, col. 1, l. 65–col. 2, l. 1)).

Wi-LAN argues the phrase “broadband wireless communication system” should not be construed as a limitation and does not need construction because it is used in the preamble to the claim and the body of the claim fully describes the claimed invention. (*See* Wi-LAN Opening 13–14). In addition, Wi-LAN argues that Alcatel-Lucent’s proposed construction improperly limits the claims to “fixed subscriber stations,” where the body of the claim uses the term “subscriber unit” and the specification explicitly recognizes that subscriber units can be both fixed and portable. (*See id.* 14).

“Generally, the preamble does not limit the claims.” *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002) (citation omitted). “Whether to treat a preamble as a limitation is a determination resolved only on review of the entire[] . . . patent to gain an understanding of what the inventors actually invented and intended to encompass by the claim. In general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (citations and internal quotation marks omitted); *see also Allen Eng’g Corp.*, 299 F.3d at 1346 (“[T]he preamble may be limiting when the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention.” (citations and internal quotation marks omitted)). Conversely, “a preamble generally is not limiting when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention. . . . Moreover, preambles describing the use of an invention generally do not

limit the claims because the patentability of apparatus or composition claims depends on the claimed structure, not on the use or purpose of that structure.” *Catalina Mktg. Int’l, Inc.*, 289 F.3d at 809 (citations omitted).

Applying these principles, the Court agrees with Wi-LAN that the disputed preamble phrase is not a limitation on the claims. The body of Claims 1 and 4 of the ’014 patent describes a structurally complete invention (a base station comprising, *inter alia*, a transmitter system and one or more processors having media access control modules), such that the deletion of the phrase “broadband wireless communication system,” would not affect the structure of the claimed invention. Moreover, the preamble claims “[a] base station *for a* broadband wireless communication system” (’014 patent, Claim 1, col. 23, ll. 5–6 (emphasis added)), implying that broadband wireless communication system is the purpose or intended use for the invention. While “statements of intended use or asserted benefits in the preamble may, in rare instances, limit apparatus claims,” this occurs “only if the applicant clearly and unmistakably relied on those uses or benefits to distinguish prior art.” *Catalina Mktg. Int’l, Inc.*, 289 F.3d at 809. Alcatel-Lucent makes no such argument here.¹⁶

Even assuming that “broadband wireless communication system” is a limitation that should be construed, the Court is not persuaded it should be construed to mean “a communication system between a base station and fixed subscriber stations,” as Alcatel-Lucent proposes. According to Alcatel-Lucent, the patentee was acting as its own lexicographer when it narrowly defined broadband wireless communication system as a system involving “fixed subscriber stations.” (*See* Alcatel-Lucent Opening 18). By making this argument, Alcatel-

¹⁶ Alcatel-Lucent merely notes that in the prosecution of related United States Patent No. 8,189,514, the examiner amended the preamble of multiple claims to change the term “wireless communication system,” to “broadband wireless communication system,” thus indicating that the PTO examiner understood the two terms were distinguishable. (*See* Alcatel-Lucent Opening 18–19).

Lucent acknowledges that the plain and ordinary meaning of broadband wireless communication system is not limited to a system involving fixed subscriber stations.¹⁷ In order to rebut the presumption that words have their ordinary and customary meaning when used in a patent claim, Alcatel-Lucent must show that “the special definition of the term is clearly stated in the patent specification or file history.” *Vitronics Corp.*, 90 F.3d at 1582; *see also Teleflex, Inc.*, 299 F.3d at 1325 (“[A]n inventor may choose to be his own lexicographer if he defines the specific terms used to describe the invention with reasonable clarity, deliberateness, and precision.” (citations and internal quotation marks omitted)). Alcatel-Lucent has not satisfied this standard. Instead, Alcatel-Lucent’s special definition relies on two tenuous premises: (1) that the patentee’s use of “subscriber unit” in the claims language, where the specification explicitly defines subscriber units as being “fixed and portable” (’014 patent, col. 1, ll. 35–36), is not relevant or determinative; and (2) the patentee defines CPEs as “fixed subscriber stations,” and “subscriber unit” as used in the claims language and “CPE” are interchangeable. The Court addresses these premises in turn.

First, Alcatel-Lucent must overcome the fact that the patentee chose to use “subscriber unit” in the claims language, not “subscriber station,” and that the specification explicitly defines subscriber units as being “fixed and portable” (’014 patent, col. 1, ll. 35–36), not just “fixed.” Alcatel-Lucent argues the definition and discussion of subscriber units in the specification take place in the background section and relate solely to the prior art. (*See* Alcatel-Lucent Resp. 9). Furthermore, Alcatel-Lucent argues, the specification thereafter uses “Customer Premises Equipment” (“CPE”) in relation to the patented invention, not “subscriber units.” (*See id.*). Even if the Court was to agree with Alcatel-Lucent’s argument that “subscriber unit,” as it is

¹⁷ Wi-LAN’s expert witness, Dr. Paul Min, testified that a person of ordinary skill in the art in the late 1990s would not have considered broadband wireless communication systems to be limited to just fixed subscriber stations. (*See* Aug. 9, 2013 Hr’g Tr. at 30:12–31:13; *id.* at 41:14–18).

used in the claims, should be treated as interchangeable with “CPE” — rather than taking on the explicit definition of “subscriber unit” disclosed in the specification — Alcatel-Lucent would nevertheless have to prove that CPEs are the equivalent of “fixed subscriber stations.”

In order to equate CPEs with fixed subscriber stations, Alcatel-Lucent first relies on a description in the specification relating to a figure (Figure 1) depicting a broadband wireless communication system adapted for use with the patented invention, that states, “[e]ach cell [] provides wireless connectivity between the cell’s base station [] and a plurality of customer premises equipment (CPE) [] positioned at fixed customer sites [] throughout the coverage area of the cell [].” (’014 patent, col. 2, ll. 8–11; *see* Alcatel-Lucent Opening 18). This, according to Alcatel-Lucent, supports its argument that CPEs are positioned at fixed customer sites. (*See* Alcatel-Lucent Opening 18). Alcatel-Lucent also relies on the following line in the specification: “The broadband wireless communication system facilitates two-way communication between a plurality of base stations and a plurality of fixed subscriber stations or Customer Premises Equipment (CPE).” (’014 patent, col. 1, l. 65–col. 2, l. 1). According to Alcatel-Lucent, this line “explicitly defin[es] [CPEs] as ‘fixed subscriber stations.’” (Alcatel-Lucent Resp. 9).

The Court is not persuaded that the specification requires CPEs to be “fixed” or defined as “fixed subscriber stations.” With regard to Figure 1, this figure is described as “[o]ne exemplary broadband wireless communication system . . . shown in the block diagram of FIG. 1.” (’014 patent, col. 2, ll. 1–4). The line that Alcatel-Lucent relies on to support its claim construction is merely a description of this one exemplary system. While the system depicted in Figure 1 is described as including a base station and a plurality of CPEs “positioned at fixed customer sites” throughout the coverage area of the cell (*id.* at col. 2, l. 10–11), this certainly

does not lead to the conclusion that CPEs in all broadband wireless communication systems must be buildings, as illustrated in Figure 1, and must be positioned at fixed customer sites.¹⁸ Rather, the specification states that broadband wireless communication systems must support “a large number of CPEs” and a “wide variety of CPE service requirements” (*id.* at col. 2, ll. 37–40), neither of which is necessarily illustrated in the oversimplified block diagram of Figure 1. Furthermore, the specification states that “the present inventive method and apparatus can be used in any type of communication, its use is not limited to a wireless communication system. . . . Alternatively, the present invention can be used in a wired communication system.” (*Id.* at col. 22, ll. 54–58, 62–63).

With regard to the statement, “[t]he broadband wireless communication system facilitates two-way communication between a plurality of base stations and a plurality of fixed subscriber stations or Customer Premises Equipment (CPE)” (*id.* at col. 1, l. 65–col. 2, l. 1), the Court is not persuaded that the patentee was, as Alcatel-Lucent argues, explicitly defining “CPE” as “fixed subscriber station,” or vice versa. The adjective “fixed” clearly relates to “subscriber stations,” but, because of the “or,” it does not necessarily relate to CPEs. Furthermore, the patentee’s use of “or” may indicate that the patentee considered fixed subscriber stations and CPEs to be entirely different objects that are both independently employable in the context of broadband wireless communication systems. The Court declines to limit the claims of the ’014 patent on the basis of one exemplary embodiment and Alcatel-Lucent’s grammatical interpretation of a statement in the specification that is, at best, ambiguous.

¹⁸ Alcatel-Lucent’s expert witness, Mr. Lanning, testified that in the late 1990s cell phones and laptop computers were widely known and CPEs could include laptop computers. (*See* Aug. 9, 2013 Hr’g Tr. at 96:18–97:2).

In sum, the Court concludes the preamble phrase “broadband wireless communication system” is not a limitation, and, absent any clear indication the patentee was acting as its own lexicographer, the phrase should be given its plain and ordinary meaning.

6. “*UL Map*” / “*DL Map*” / “*Map*”

The parties dispute the proper construction of the terms “uplink (UL) map,” “downlink (DL) map,” and, more generally, “map” (collectively, “UL/DL/map”), as these terms are used in Claims 1 and 4 of the ’014 patent. These claims, with the disputed terms in bold, are as follows:

Claim 1: A base station for a broadband wireless communication system, comprising:

a transmitter system for transmitting downlink (DL) traffic to a plurality of subscriber units and a receiver for receiving uplink (UL) traffic from the plurality of subscriber units; and

one or more processors having a media access control (MAC) module configured to

detect a bandwidth (BW) request in the UL traffic received from a subscriber unit,

identify in the BW request a requested amount of UL bandwidth pertaining to a specified connection established at the subscriber unit,

determine if bandwidth is available for the subscriber unit, and then allocate to the subscriber unit a granted amount of UL bandwidth,

maintain an **UL map** with uplink bandwidth allocations,

dynamically update the **UL map** to account for the granted amount of UL bandwidth,

provide the updated **UL map** to the transmitter system for transmitting to plurality of subscriber units, and

indicate to the subscriber unit that the request has been granted by providing the granted amount of UL bandwidth to the subscriber unit.

(’014 patent, col. 23, ll. 5–28).

Claim 4: A base station for a broadband wireless communication system which transmits downlink (DL) traffic to subscriber units and receives uplink (UL) traffic from the subscriber units, the base station comprising:

an antenna system for transmitting downlink (DL) traffic to subscriber units and receiving uplink (UL) traffic from the subscriber units;

one or more processors having a media access control (MAC) module configured to

detect a bandwidth (BW) request in the UL traffic received from a subscriber unit,

identify in the BW request a requested amount of UL bandwidth pertaining to a specified connection established at the subscriber unit,

determine if bandwidth is available for the subscriber unit, and allocate to the subscriber unit a granted amount of UL bandwidth, if bandwidth is available for the subscriber unit,

maintain a **DL map** and an **UL map** with downlink and uplink bandwidth allocations respectively,

dynamically update the **UL map** to account for the granted amount of UL bandwidth, if the granted amount of UL bandwidth is granted, and

provide updated **DL and UL maps** to the antenna system for transmitting to the subscriber units.

(*Id.* at col. 23, l. 36–col. 24, l. 11).

Wi-LAN proposes that “UL/DL/map” be construed as either a “data structure containing a modulation scheme,” or, alternatively, a “data structure indicating a modulation scheme.” (Joint Notice 3). Alcatel-Lucent proposes that “UL/DL/map” mean “a persistent set of uplink/downlink bandwidth allocations.” (*Id.*).

In support of its construction, Wi-LAN states that one of skill in the art would understand “map” to mean “data structure containing a modulation scheme,” and thus, one of skill in the art would understand UL map to be a “structure for uplink data that contains a modulation scheme,” and DL map to be a “structure for downlink data that contains a modulation scheme.” (Wi-LAN

Opening 15). Wi-LAN also claims the specification teaches that maps contain a modulation scheme. (*See id.*). According to Wi-LAN, Alcatel-Lucent's proposed construction is redundant in its use of "bandwidth allocations" where the claims already explicitly require the map contain bandwidth allocations, and it improperly includes a limitation that bandwidth allocations are "persistent" where the specification explains that bandwidth allocations are in a constant state of change owing to the dynamic nature of bandwidth requirements. (*See id.* 15–16).

In support of its proposed construction, Alcatel-Lucent notes that the patent requires base stations to maintain the UL/DL/maps, and thus the maps are persistent. (*See Alcatel-Lucent Opening 19*). Alcatel-Lucent argues that Wi-LAN's inclusion of a modulation scheme in its proposed construction is improper because "[n]owhere does the patent disclose that the maps contain a modulation scheme." (*Id.*). Alcatel-Lucent notes that "while the base station determines the order in which CPEs are scheduled within a sub-frame based on the type of modulation they use, the patent does not teach sub-frame maps that include a modulation scheme." (Alcatel-Lucent Resp. 11). "Instead, the specification only discloses that the ordering of particular bandwidth allocations is based on modulation schemes, while the map simply reflects these bandwidth allocations." (*Id.* 10).

The Court, in its review of the intrinsic evidence and, in particular, the citations to the specification that Wi-LAN claims support its construction, finds no support for Wi-LAN's argument that the UL/DL/maps employ a modulation scheme. The Court agrees with Alcatel-Lucent that the specification makes a clear distinction between the UL/DL/maps themselves employing a modulation scheme, and the UL/DL/maps reflecting bandwidth allocations that are based in part on modulation schemes.

To start, the specification distinguishes between frames/sub-frames and sub-frame maps. Frames and sub-frames are the structures used by the patented invention to allocate bandwidth. As discussed, the specification invokes a time division duplexing (“TDD”) scheme wherein “the TDD frame is subdivided into a plurality of physical slots (PS)” and “available bandwidth is allocated by a base station in units of a certain pre-defined number of PSs.” (’014 patent, col. 7, ll. 39–40, 44–45). The specification discloses that the patented invention can be used in adaptive and fixed TDD systems using a frame and multi-frame structure. (*See id.* at col. 7, ll. 59–61). Figure 3 in the specification “shows an example of a downlink sub-frame that can be used by the base stations to transmit information to the plurality of CPEs” (*Id.* at col. 5, ll. 21–23).

Sub-frame maps simply reflect the bandwidth allocations made in the frames/sub-frames. According to the specification, the “base stations [] maintain sub-frame maps of the bandwidth allocated to the uplink and downlink communication links.” (*Id.* at col. 7, ll. 17–18). For example, the base station “maintains a downlink sub-frame map *that reflects* the downlink bandwidth allocation.” (*Id.* at col. 8, ll. 11–13 (emphasis added)). In relation to uplink-sub frame maps, the specification discloses that bandwidth allocations are made implicitly “in the form of bandwidth allocation increases in the transmitted map *describing* the uplink sub-frame [].” (*Id.* at col. 12, ll. 11–13 (emphasis added)). “The uplink sub-frame map [] is communicated to the CPE MAC when the base station transmits this information to the CPE via the downlink.” (*Id.* at col. 13, ll. 52–55).

When modulation schemes are discussed in the specification, it is in relation to the uplink or downlink frames/sub-frames, not the maps. For example, in relation to the downlink sub-frame shown in Figure 3, the specification describes that, “the downlink sub-frame [] preferably comprises a frame control header [], a plurality of downlink data PSs [] grouped by modulation

type (e.g., PS [] data modulated using a QAM-4 modulation scheme, PS [] data modulated using QAM-16, etc.) and possibly separated by associated modulation transition gaps (MTGs) [] used to separate differently modulated data, and a transmit/receive transition gap [].” (*Id.* at col. 8, ll. 13–20). According to the specification, “downlink data PSs are used for transmitting data and control messages to the CPE” and “[d]ata is preferably transmitted in a pre-defined modulation sequence: such as QAM-4, followed by QAM-16, followed by QAM-64.” (*Id.* at col. 8, ll. 29–30, 33–35). In relation to the uplink sub-frame, the specification states, “[t]he CPE scheduled data is ordered within the uplink sub-frame [] based upon the modulation scheme used by the CPEs [].” (*Id.* at col. 9, ll. 18–20). Thus, while data may be organized in a sub-frame and transmitted based on modulation type or scheme, nothing in the specification indicates that the UL/DL/maps themselves employ any sort of modulation scheme.¹⁹

The Court concludes that “UL/DL/maps” should be construed to mean “a persistent set of uplink/downlink bandwidth allocations,” as this construction most accurately reflects the purpose of the UL/DL/maps as disclosed in the claims and specification. Furthermore, Alcatel-Lucent’s use of the term “persistent” merely reflects the point that these maps are not ephemeral. In accordance with the language in the claims, the base station must “maintain” UL/DL/maps that can be transmitted to the subscriber units. (*Id.* at Claim 1, col. 23, ll. 21, 24–25; *id.* at col. 24, ll. 5, 10–11). The term is not, as Wi-LAN argues, inconsistent with the requirement that the maps also be “dynamically update[ed]” to account for bandwidth allocations. (*Id.* at Claim 1, col. 23, ll. 22–23).

¹⁹ There is also no modulation scheme indicated in Figure 7, the only exemplary uplink sub-frame map included in the specification. (*See* ’014 patent, Fig. 7; *id.* at col. 5, ll. 32–34). The map in Figure 7 merely reflects the physical slot assigned to a CPE or group of CPEs. For example, the map reflects the assignment of physical slot (“PS”) 450 to a multicast group bandwidth request contention slot, represented as connection ID 0xF000. (*See id.* at Fig. 7; *id.* at col. 15, ll. 1–3, 26–28).

B. Phrase Used In the '437 Patent: “Random access identifier”

The parties dispute the proper construction of the phrase “random access identifier” as it is used in Claims 1, 8, 15, and 18 of the '437 patent. These claims, with the disputed terms in bold, are as follows:

Claim 1: A method for handover of an existing communication link of a mobile station to a target base station, the method comprising:

allocating, by the target base station, a **random access identifier** that uniquely identifies the mobile station in a coverage area of the target base station in association with the handover of the existing communication link;

receiving, by the target base station, the allocated **random access identifier** from the mobile station over a random access channel;

generating, by the target base station, based on the receiving the allocated **random access identifier**, a feedback message comprising a timing adjustment; and

transmitting, by the target base station, the feedback message to the mobile station for synchronizing the mobile station with the target base station.

('437 patent, col. 21, ll. 2–17).

Claim 8: A target base station comprising:

a processor configured to allocate a **random access identifier** uniquely identifying a mobile station in a coverage area of the target base station in association with a handover of an existing communication link;

a receiver configured to receive the allocated **random access identifier** from the mobile station over a random access channel;

the processor further configured to generate, based on the reception of the **random access identifier** by the receiver, a feedback message comprising a timing adjustment; and

a transmitter configured to transmit the feedback message to the mobile station for synchronizing the mobile station with the target base station.

(*Id.* at col. 21, ll. 32–46).

Claim 15: A method for handover of an existing communication link of a mobile station from a serving base station to a target base station, the method comprising:

receiving, by the serving base station, an allocation of a **random access identifier** from the target base station that uniquely identifies the mobile station in a coverage area of the target base station in association with the handover, wherein the allocated **random access identifier**, when received by the target base station from the mobile station over a random access channel, is usable by the target base station to generate a feedback message comprising a timing adjustment to synchronize the mobile station with the target base station; and

transmitting, by the serving base station, the allocation of the **random access identifier** to the mobile station over the existing communication link of the mobile station, wherein the allocated **random access identifier** is usable by the mobile station for synchronizing the mobile station with the target base station in association with the handover.

(*Id.* at col. 22, ll. 5–24).

Claim 18: A serving base station comprising:

a module configured to receive an allocation of a **random access identifier** from a target base station that uniquely identifies a mobile station in a coverage area of the target base station, wherein the allocated **random access identifier**, when received by the target base station from the mobile station over a random access channel, is usable by the target base station to generate a feedback message comprising a timing adjustment to synchronize the mobile station with the target base station in association with a handover of an existing communication link between the mobile station and the serving base station to the target base station; and

a transmitter configured to transmit the allocation of the **random access identifier** to the mobile station over the existing communication link of the mobile station, wherein the allocated **random access identifier** is usable by the mobile station for synchronizing the mobile station with the target base station in association with the handover.

(*Id.* at col. 22, ll. 31–50).

According to Wi-LAN’s proffered construction, a “random access identifier” means a “reserved access code for use on a random access channel.” (Joint Notice 4). Alcatel-Lucent proposes that a “random access identifier” mean a “pre-allocated code for use on a random access channel.” (*Id.*). Both parties agree the random access identifier is a code that is used on a

random access channel. The parties disagree, however, on whether the random access identifier is most appropriately construed as a “reserved” code or a “pre-allocated” code.

Construing a random access identifier as a “pre-allocated” code is more consistent with the intrinsic record. The ’437 patent itself is titled, “Pre-Allocated Random Access Identifiers,” and the term “pre-allocated” is used in association with the description of this code throughout the specification. For example, in the brief summary of the patented invention, the specification describes how a base station receiving and processing anonymous requests for resources over the random access channel can reduce the probability of collisions and conserve resources “by pre-allocating one or more codes to select wireless device,s” and “[t]he wireless devices having the pre-allocated codes can transmit a particular code over the random access channel as a request for resources that uniquely identifies the requester.” (’437 patent, col. 1, ll. 35–45). The specification also explains how a base station may receive a “pre-allocated code in the random access channel” and “know[] both the identity of the subscriber station as well as the size of the bandwidth request” and “immediately allocate the resources to the subscriber station in a UL-MAP.” (*Id.* at col. 15, l. 65–col. 16, l. 3). Finally, the term “pre-allocate” also accurately reflects the sequence of events in a handover process, wherein the random access identifier is provided by the target base station to the serving base station for assignment to the subscriber station, before it is actually used by the subscriber station for identification and synchronization with the target base station. (*See id.* at Claim 15, col. 22, ll. 5–24).

In support of its proposed construction, Wi-LAN relies on a description in the specification showing how a base station may reserve codes for use over the random access channel. In particular, the specification describes how base stations may support the use of distinct pseudorandom codes that correspond to four usage types (initial ranging, periodic

ranging, bandwidth request, and handover) for conveying information over a random access channel. (*See id.* at col. 5, ll. 18–24). A subscriber station with a need for communicating information with the base station can “randomly select a code from the available group of codes corresponding to a usage type” and send “the randomly selected code . . . to the base station [] over the random access channel.” (*Id.* at col. 5, ll. 31–36). The specification explains that in some instances, the usage type map may not map all of the codes. (*See id.* at col. 12, ll. 41–43). Codes that are “absent from the usage type map represent codes reserved for pre-allocation.” (*Id.* at col. 12, ll. 44–45). These “reserved codes are not to be randomly selected for random access channel request and can indicate in the storage device that the codes are reserved or can otherwise indicate that the codes are not available for selection.” (*Id.* at col. 12, ll. 45–49). Similarly, in other embodiments, “the usage type map can explicitly label a group of one or more codes reserved for pre-allocation.” (*Id.* at col. 12, ll. 49–51).

Wi-LAN’s reliance on this description of base stations reserving codes for use over the random access channel is not persuasive. While the specification supports the idea that amongst its universe of codes a base station may “reserve,” or set aside, a certain number for pre-allocation as random access identifiers, it does not specifically support a construction that the codes used as random access identifiers themselves are “reserved” in some manner. Additionally, the specification uses the term “reserved” in relation to codes being set aside for various usage types or instances, not just as random access identifiers. (*See id.* at col. 6, ll. 7–9 (“The base station [] can reserve some codes for use by subscriber stations not having a pre-allocated code for a particular usage type or instance.”)).

Wi-LAN’s proposed use of “reserved” could also be misleading in the extended length of time implied by the term. Although random access identifiers are used to uniquely identify one

subscriber station at a time, they are not necessarily reserved for use by that subscriber station indefinitely. As noted by Alcatel-Lucent’s expert, and not disputed by Wi-LAN, the random access identifiers are released by the subscriber station after the handover has occurred and can subsequently be used by a different subscriber station in a different handover context. (*See* Aug. 9, 2013 Hr’g Tr. 77:14–78:9; *id.* at 84:3–8). Thus, rather than clarify the meaning of random access identifier, the use of the term “reserved” tends to promote confusion.

Accordingly, the Court accepts Alcatel-Lucent’s proposed construction of “random access identifier” as a “pre-allocated code for use on a random access channel.”²⁰

C. Means-Plus-Function Claim Construction: “Processor(s)” and “Module”

The parties disagree on whether the following phrases found in the Asserted Patents invoke a Section 112(f) means-plus-function claim construction: (1) “processors having a media access control (MAC) module configured to,” in Claims 1 and 7 of the ’298 patent and Claims 1 and 4 of the ’014 patent; (2) “a processor configured to” in Claim 8 of the ’437 patent; and (3) “a module configured to” in Claim 18 of the ’437 patent.

Claims 1 and 7 of the ’298 patent, with the disputed phrases in bold, are as follows:

Claim 1: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units; and

one or more **processors having a media access control (MAC) module configured to**

detect a bandwidth request in uplink (UL) data received from a subscriber unit and identify in the bandwidth request a requested amount of UL bandwidth pertaining to a UL queue established at the subscriber unit;

²⁰ Alcatel-Lucent originally proposed that “random access identifier” be construed to mean “a code used to modulate data that is to be transmitted over a random access channel.” (Joint Notice 4). For reasons already explained, the Court adopts Alcatel-Lucent’s compromise proposed construction.

determine if the requested amount of bandwidth is available; and

allocate to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data, wherein the UL bandwidth grant is allocated to the subscriber unit for distribution, without any control from the base station, between the connections established at the subscriber unit.

('298 patent, col. 23, ll. 10–29).

Claim 7: A base station for communication with a plurality of subscriber units connected in a wireless communication system, the base station comprising:

a transmitter for transmitting downlink (DL) traffic to subscriber units;

a receiver for receiving uplink (UL) traffic from the subscriber units; and

one or more **processors having a media access control (MAC) module configured to**

detect a bandwidth request in UL data received from a subscriber unit and identify in the bandwidth request a requested amount of UL bandwidth pertaining to a UL queue established at the subscriber unit;

determine if the requested amount of bandwidth is available;

allocate to the subscriber unit an UL bandwidth grant based on the requested amount and the bandwidth available for UL data, wherein the UL bandwidth grant is allocated to the subscriber unit for distribution between the connections established at the subscriber unit, without any control from the base station; and

a memory for storing a logical view of UL queues maintained by the subscriber unit, the queues being maintained based on the bandwidth requests received from the subscriber unit.

(*Id.* at col. 23, l. 49–col. 24, l. 6).

Claims 1 and 4 of the '014 patent, with the disputed phrases in bold, are as follows:

Claim 1: A base station for a broadband wireless communication system, comprising:

a transmitter system for transmitting downlink (DL) traffic to a plurality of subscriber units and a receiver for receiving uplink (UL) traffic from the plurality of subscriber units; and

one or more **processors having a media access control (MAC) module configured to**

detect a bandwidth (BW) request in the UL traffic received from a subscriber unit,

identify in the BW request a requested amount of UL bandwidth pertaining to a specified connection established at the subscriber unit,

determine if bandwidth is available for the subscriber unit, and then allocate to the subscriber unit a granted amount of UL bandwidth,

maintain an UL map with uplink bandwidth allocations,

dynamically update the UL map to account for the granted amount of UL bandwidth,

provide the updated UL map to the transmitter system for transmitting to plurality of subscriber units, and

indicate to the subscriber unit that the request has been granted by providing the granted amount of UL bandwidth to the subscriber unit.

('014 patent, col. 23, ll. 5–28).

Claim 4: A base station for a broadband wireless communication system which transmits downlink (DL) traffic to subscriber units and receives uplink (UL) traffic from the subscriber units, the base station comprising:

an antenna system for transmitting downlink (DL) traffic to subscriber units and receiving uplink (UL) traffic from the subscriber units;

one or more **processors having a media access control (MAC) module configured to**

detect a bandwidth (BW) request in the UL traffic received from a subscriber unit,

identify in the BW request a requested amount of UL bandwidth pertaining to a specified connection established at the subscriber unit,

determine if bandwidth is available for the subscriber unit, and allocate to the subscriber unit a granted amount of UL bandwidth, if bandwidth is available for the subscriber unit,

maintain a DL map and an UL map with downlink and uplink bandwidth allocations respectively,

dynamically update the UL map to account for the granted amount of UL bandwidth, if the granted amount of UL bandwidth is granted, and

provide updated DL and UL maps to the antenna system for transmitting to the subscriber units.

(*Id.* at col. 23, l. 36–col. 24, l. 11).

Claims 8 and 18 of the '437 patent, with the disputed phrases in bold, are as follows:

Claim 8: A target base station comprising:

a processor configured to allocate a random access identifier uniquely identifying a mobile station in a coverage area of the target base station in association with a handover of an existing communication link;

a receiver configured to receive the allocated random access identifier from the mobile station over a random access channel;

the processor further configured to generate, based on the reception of the random access identifier by the receiver, a feedback message comprising a timing adjustment; and

a transmitter configured to transmit the feedback message to the mobile station for synchronizing the mobile station with the target base station.

('437 patent, col. 21, ll. 32–46).

Claim 18: A serving base station comprising:

a module configured to receive an allocation of a random access identifier from a target base station that uniquely identifies a mobile station in a coverage area of the target base station, wherein the allocated random access identifier, when received by the target base station from the mobile station over a random access channel, is usable by the target base station to generate a feedback message comprising a timing adjustment to synchronize the mobile station with the target base station in association with a handover of an existing communication link between the mobile station and the serving base station to the target base station; and

a transmitter configured to transmit the allocation of the random access identifier to the mobile station over the existing communication link of the mobile station, wherein the allocated random access identifier is usable by the mobile

station for synchronizing the mobile station with the target base station in association with the handover.

(*Id.* at col. 22, ll. 31–50).

Alcatel-Lucent argues that Claims 1 and 7 of the '298 patent, Claims 1 and 4 of the '014 patent, and Claims 8 and 18 of the '437 patent, consist of nothing more than the words “processor(s)” or “module,” which fail to recite sufficient structure, followed by wholly functional language. (*See* Alcatel-Lucent Opening 11–13, 23–24). According to Alcatel-Lucent, these claims should be treated as means-plus-function limitations, governed by Section 112(f). (*See id.*). In anticipation that Section 112(f) will apply, Alcatel-Lucent provides charts for the disputed claims, wherein it identifies the function of the limitation, as well as corresponding structure for the function disclosed in the specification. (*See id.*, App. A [ECF No. 90-16]; *id.*, App. B [ECF No. 90-17]; *id.*, App. C [ECF No. 90-18]; *id.*, App. D [ECF No. 90-19]).

Wi-LAN insists that the disputed phrases should not be treated as means-plus-function limitations. (*See* Wi-LAN Opening 20–22). According to Wi-LAN, because the claim terms do not use the word “means,” there is a strong presumption that Section 112(f) does not apply. (*See id.* 20–21). Furthermore, Wi-LAN argues, this presumption is not overcome because one of ordinary skill in the art would understand “processor(s)” and “module” to recite sufficiently definite structure to perform the claimed functions. (*See id.* 21–22). Wi-LAN criticizes Alcatel-Lucent’s proposed means-plus-function claim constructions as not having sufficiently tied the proposed structures to the purported function. (*See* Wi-LAN Resp. 18). Wi-LAN does not itself provide any means-plus-function claim constructions.

Prior to embarking on a means-plus-function claim construction, the Court must determine whether the limitations in question invoke Section 112(f) in the first instance. *See Rodime PLC*, 174 F.3d at 1302. It is undisputed that Claims 1 and 7 of the '298 patent, Claims 1

and 4 of the '014 patent, and Claim 8 of the '437 patent (collectively, the “‘processor(s)’ claims”), as well as Claim 18 of the '437 patent (the “‘module’ claim”), do not use the word “means.” Consequently, there is a presumption that section 112(f) does not apply. *See Lighting World, Inc.*, 382 F.3d at 1358. “[T]he presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome.” *Id.* The Federal Circuit has “seldom held that a limitation not using the term ‘means’ must be considered to be in means-plus-function form.” *Id.* at 1362 (noting only one published Federal Circuit decision where it was held that “lever moving element” and “movable link member” were means-plus-function limitations, as the patentee had not directed the court to any evidence demonstrating the terms had a well-understood meaning in the art, and where the prosecution record showed the patentee had used the terms “member,” “element,” and “means” interchangeably).

To overcome the presumption that Section 112(f) does not apply, Alcatel-Lucent must demonstrate that the “processor(s)” claims and the “module” claim, fail to recite sufficiently definite structure or else recite function without reciting sufficient structure for performing that function. *See id.* at 1358. In considering whether the “processor(s)” claims and the “module” claim recite sufficient structure to avoid application of Section 112(f), the Federal Circuit does not require that the claim terms denote, or bring to mind, a particular structure. *See id.* at 1359–60. “[I]t is sufficient if the claim term[s] [are] used in common parlance or by persons of skill in the pertinent art to designate structure, even if the term[s] cover[] a broad class of structures and even if the term[s] identif[y] the structures by their function.” *Id.* In sum, “[w]hat is important is whether the term is one that is understood to describe structure” and is not “simply a substitute for the term ‘means for.’” *Id.* at 1360.

When determining whether Alcatel-Lucent has rebutted the presumption that the “processor(s)” claims and the “module” claim recite sufficiently definite structure, the Court may consult relevant intrinsic and extrinsic evidence. *See id.* (“[W]e have looked to the dictionary to determine if a disputed term has achieved recognition as a noun denoting structure, even if the noun is derived from the function performed.”); *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1357 (Fed. Cir. 2011) (“In cases where the claims do not recite the terms ‘means,’ considering intrinsic and extrinsic evidence is usually helpful, as the litigated issue often reduces to whether skilled artisans, after reading the patent, would conclude that a claim limitation is so devoid of structure that the drafter constructively engaged in means-plus-function claiming.”).

The Court addresses the “processor(s)” claims and the “module” claim separately.

1. “Processors having a media access control (MAC) module configured to” / “Processor configured to”

In support of its argument that the “processor(s)” claims should be construed as means-plus-function claims, Alcatel-Lucent relies heavily on the Federal Circuit decision in *Aristocrat Techs. Australia Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328 (Fed. Cir. 2008). In *Aristocrat*, the claim used the term “control means,” which the parties agreed invoked Section 112(f). 521 F.3d at 1331. The court thus proceeded to apply means-plus-function claim construction, which required the scope of the claim limitation to be defined by the structure disclosed in the specification plus any equivalents of that structure. *See id.* The patent-holder argued the structure corresponding to the recited functions was a standard microprocessor-based gaming machine with appropriate programming. *See id.* The Federal Circuit held, “[i]n cases involving a computer-implemented invention in which the inventor has invoked means-plus-function claiming, this court has consistently required that the structure disclosed in the specification be

more than simply a general purpose computer or microprocessor. . . . For a patentee to claim a means for performing a particular function and then to disclose only a general purpose computer as the structure designed to perform that function amounts to pure functional claiming.” *Id.* at 1333. Alcatel-Lucent makes an argument based on the reverse legal theory, claiming that if “processor” is an insufficient structure to define the scope of a means-plus-function limitation, it cannot describe sufficient structure when recited directly in a claim limitation itself. (*See* Alcatel-Lucent Opening 11–12).

The Court is not persuaded that *Aristocrat* is applicable or binding in this instance. *Aristocrat* analyzed claim language that used the term “means,” and as such, there was a presumption that means-plus-function claim limitations were at issue. The *Aristocrat* rule that Alcatel-Lucent argues should apply in this instance was therefore derived from a determination as to whether sufficient structure was disclosed in the specification so as to avoid a finding of indefiniteness. Alcatel-Lucent is, in effect, treating as equivalent the standard used to prove sufficient structure to avoid means-plus-function treatment in the first instance, with the standard used to identify corresponding structure in the specification to support a means-plus-function claim construction. While Alcatel-Lucent is able to cite two unreported district court cases from outside the Eleventh Circuit that applied *Aristocrat* in this manner,²¹ other courts have declined to do so. *See eWinWin, Inc. v. Groupon, Inc.*, No. 8:10-cv-2678-T-24 AEP, 2011 WL 6012194, at *14–15 (M.D. Fla. Sept. 5, 2011) (declining to apply *Aristocrat* to find that “computer code” was written as a means-plus-function limitation, and noting that “the law on this issue goes both

²¹ *See* Order Denying Defendant’s Motion for Summary Judgment of Indefiniteness, *Personal Audio, LLC v. Apple, Inc.*, No. 9:09-cv-00111 (E.D. Tex. Jan 30, 2011), [ECF No. 292] (construing claim terms that “all recite either ‘a processor for’ performing certain functions, or state that ‘said processor responds’ to commands from the user by performing certain functions,” as means-plus-function limitations); *Soque Holdings (Bermuda) Ltd. v. Keyscan, Inc.*, No. C 09-2651 MHP, 2010 WL 2292316, at *11–12 (N.D. Cal. June 7, 2010) (holding that “computer,” when used in the claims, did not adequately describe a specific structure).

ways, and the Federal Circuit has not had an opportunity to take a clear stance on facts similar to those in the instant case. However, given that less than three months ago the Federal Circuit re-emphasized its position that ‘the presumption flowing from the absence of the term ‘means’ is a strong one that is not readily overcome,’ this Court concludes that the presumption has not been overcome in the instant case.” (citing *Inventio AG*, 649 F.3d at 1356)); *Markem-Imaje Corp. v. Zipher Ltd.*, No. 10-cv-112-PB, 2011 WL 5837087, at *4 n.7 (D.N.H. Nov. 21, 2011) (“The structural disclosure required in the specification when a party chooses to employ means-plus-function claiming is not the same structural disclosure required to avoid means-plus-function treatment.”); *Chamberlain Grp., Inc. v. Lear Corp.*, 756 F. Supp. 2d 938, 977 (N.D. Ill. 2010) (noting that *Aristocrat* only applies when Section 112(f) has been invoked).

Clearly applicable Federal Circuit law requires only that the claim recite some structure. *See Lighting World*, 382 F.3d at 1359–60. The only evidence presented by Alcatel-Lucent in support of its assertion that the “processor(s)” claims fail to recite sufficient structure for performing the functions disclosed in the limitations is a Declaration from its expert witness, Mr. Lanning,²² which states:

[o]ne of ordinary skill in the art would not consider a processor to be a definite structure for performing a specified function. A processor is a blank slate that requires detailed instructions (software) before it can perform a task. Furthermore, a processor can perform a variety of different tasks depending on the programming. As a result, one having ordinary skill in the art would understand that a processor, on its own, does not provide any definite structure to perform a particular function unless it is loaded with specific instructions.

(Lanning Decl. 15).

²² The parties did not present evidence pertaining to the means-plus-function argument at the *Markman* hearing and were content to rely on their briefing and expert witness affidavits. (See Aug. 9, 2013 Hr’g Tr. 253:23–254:10).

While “processor(s)” may not bring to mind a particular or “definite structure,” this is not the standard. *See Lighting World*, 382 F.3d at 1359–60; *Personalized Media Comm’ns LLC*, 161 F.3d at 705 (“neither the fact that a ‘detector’ is defined in terms of its function, nor the fact that the term ‘detector’ does not connote a precise physical structure in the minds of those of skill in the art detracts from the definiteness of structure.”). Mr. Lanning does not dispute the assertion that “processor(s),” albeit a term that might cover a broad class of structures, designates some structure. This is also supported by Wi-LAN’s extrinsic evidence. A technical dictionary definition relied on by Wi-LAN defines “processor” as “(1) a device that interprets and executes instructions, consisting of a least an instruction control unit and an arithmetic unit. . . . (2) A device that contains a central processing unit.” (Wi-LAN Resp., Ex. F at 5 [ECF No. 98-7]). Wi-LAN’s expert witness, in turn, states that one of ordinary skill in the art would understand “processor(s),” which interprets and executes instructions, to include a central processing unit and “a memory to store the status of results as the program is executed.” (Min Decl. 10).

Contrary to the implication raised by Mr. Lanning in his declaration as well as Alcatel-Lucent’s briefing on the matter, the term “processor(s)” does not have to be reviewed “on its own.” (Lanning Decl. 15). Rather, the limitations should be viewed as a whole. *See Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1372 (Fed. Cir. 2003) (finding the district court erred as a matter of law, and noting “[t]he primary source of this error lies in the district court’s reliance on single words of the limitation, e.g., ‘circuit,’ as opposed to the limitations as a whole, e.g., ‘a first interface circuit for receiving keyboard and cursor control device signals from the workstation.’”). The Federal Circuit has held that when “the structure-connoting term [] is coupled with a description of the [term’s] operation, sufficient structural meaning generally will be conveyed to persons of ordinary skill in the art” *Linear Tech. Corp. v. Impala Linear*

Corp., 379 F.3d 1311, 1320 (Fed. Cir. 2004) (finding that where “[t]he contextual language describes the objective of the ‘circuit,’ ‘monitoring a signal from the output terminal,’ and the desired output of the ‘circuit,’ ‘generat[ing] a first feedback signal,’” sufficient structure was suggested to persons of ordinary skill in the art); *see also Inventio AG*, 649 F.3d at 1358 (holding that the written descriptions in the claims supported the conclusion that the claimed “modernizing device” was not a purely functional limitation). Neither Alcatel-Lucent nor its expert analyzed “processor(s)” in the context of the rest of the claims language and, by failing to do so, ignored detailed descriptions of the operations of the processor(s) which may convey structural meaning.

Alcatel-Lucent’s means-plus-function argument is also deficient as there is no discussion of the fact that “processors” does not appear in isolation in Claims 1 and 7 of the ’298 patent, and Claims 1 and 4 of the ’298 patent. Rather, the ’298 and ’014 patents claim “processors having a media access control (MAC) module” (’298 patent, Claim 1, col. 23, ll. 15–16; *id.* at Claim 7, col. 23, ll. 56–57; ’014 patent, Claim 1, col. 23, ll. 11–12; *id.* at Claim 4, col. 23, ll. 43–44). “Media access control (MAC) module” may serve a structure identifying function. In addition, there is no discussion of the fact that “processor” appears a second time in Claim 8 of the ’437 patent, wherein the claim states, “the processor further configured to generate . . . a feedback message comprising a timing adjustment” (’437 patent, Claim 8, col. 21, ll. 42–44). This second mention of “processor” is potentially relevant because every use of the term in the asserted claims includes qualifications further identifying sufficient structure to perform the claimed functions to one of ordinary skill in the art.

In light of these deficiencies and in the absence of more compelling evidence, the Court determines that Alcatel-Lucent has failed to rebut the presumption that Section 112(f) does not

apply. The “processor(s)” claims, Claims 1 and 7 of the ’298 patent, Claims 1 and 4 of the ’014 patent, and Claim 8 of the ’437 patent, are not means-plus-function limitations.

2. “*Module configured to*”

With respect to the use of “module” in Claim 18 of the ’437 patent (the “‘module’ claim”), the evidence and argument presented by Alcatel-Lucent are even more deficient. Alcatel-Lucent’s own expert witness admits a module refers to some structure, by stating, “[a] module can refer to a piece of hardware, a portion of software that has a specific purpose or combination of hardware and software,” but then simply states, “one of ordinary skill in the art would not understand what structure is meant by the term ‘module.’” (Lanning Decl. 15). In its argument, Alcatel-Lucent cites several district court decisions that have addressed the meaning of the term “module,” and then conclusively states “the claim limitation consists entirely of a function that a ‘module’ is ‘configured to’ have,” and “therefore fails to recite sufficient structure for performing the disclosed functions.” (Alcatel-Lucent Opening 24).²³ There is, in effect, no analysis or evidence that “module,” as used in the particular context of the ’437 patent, does not recite sufficient structure.


²³ Wi-LAN’s evidence in support of its argument that one of skill in the art would understand “module” to be sufficiently definite structure is similarly deficient. Wi-LAN’s expert witness states, without providing any explanation in support, that “[h]aving reviewed the specifications and the claim language, one of skill in the art would understand the structure that is claimed as ‘processor [] configured to’ and ‘module configured to.’” (Min Decl. 10). Wi-LAN also provides several citations to disclosures in the specification that it claims supports its argument that one of ordinary skill in the art would understand “module configured to” to recite sufficient structure. The cited portions of the specification, however, describe configuration modules that can track codes used in the random access channel (*see* Wi-LAN Opening 22 (citing ’437 patent, col. 6, l. 59–col. 7, l. 5)) and can allocate codes to registering subscriber stations (*see id.* (citing ’437 patent, col. 7, l. 36–col. 8, l. 28)). The Court is not persuaded these disclosed configuration modules relate in any way to the particular module at issue in Claim 18 of the ’437 patent, which is described as being part of a serving base station and is described as being “configured to receive an allocation of a random access identifier from a target base station” (’437 patent, Claim 18, col. 22, ll. 31–33). Nonetheless, because the claim does not use the term “means,” it is Alcatel-Lucent, not Wi-LAN, that bears the burden of proving the “module” claim falls within the ambit of Section 112(f).

In the absence of any compelling evidence of the understanding of one of ordinary skill in the art, the presumption that Section 112(f) does not apply is determinative. On this basis, the Court finds that “module configured to,” in Claim 18 of the ’437 patent, is not a means-plus-function limitation.

IV. CONCLUSION

Accordingly, it is **ORDERED AND ADJUDGED** that the claims, terms, and phrases of the patents-at-issue are construed as set forth above.

DONE AND ORDERED at Miami, Florida, this 9th day of September, 2013.



CECILIA M. ALTONAGA
UNITED STATES DISTRICT JUDGE

cc: counsel of record