IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

G+ COMMUNICATIONS, LLC,	§	
	§	
Plaintiff,	§	
	§	
v.	§	
	§	CIVIL ACTION NO. 2:22-CV-00078-JRG
SAMSUNG ELECTRONICS CO. LTD.,	§	
SAMSUNG ELECTRONICS AMERICA,	§	
INC.,	§	
	§	
Defendants.	§	
	§	

CLAIM CONSTRUCTION MEMORANDUM OPINION AND ORDER

G+ Communications, LLC, alleges infringement by Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc., (together "Samsung") of claims from U. S. Patents 8,761,776, 9,184,881, 10,448,430, 10,594,443, and 10,736,130. Generally, the patents relate to wireless communications, such as LTE systems. *See* '776 Patent at 1:6–7 ("The present invention relates to the field of communications, particularly to a cell reselection method and terminal."); '881 Patent at 1:13–15 ("The present invention relates to communication field [sic], and in particular to a method for feeding back confirmation information on a physical uplink shared channel[.]"); '430 Patent at 1:6–8 ("The present disclosure relates to . . . the field of communications, and in particular to a random access method, device and system."); '443 Patent at 1:16–20 ("The present disclosure relates to . . . wireless communication technology, particularly to a method for transmitting [and receiving HARQ] information[.]"); '130 Patent at 1:7–10 ("The disclosure relates to an uplink control signal transmission technology, and in particular to a method and device for uplink control signal transmission, a user terminal and a storage medium.").

In their briefing, the parties dispute the scope of fifteen terms and phrases, with Samsung challenging many of the terms as indefinite. Having considered the parties' briefing and arguments of counsel during a June 1, 2023 hearing, the Court resolves the disputes as follows.

I. GENERAL LEGAL STANDARDS

A. Generally

"[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). As such, if the parties dispute the scope of the claims, the court must determine their meaning. *See, e.g.*, *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1317 (Fed. Cir. 2007); *see also Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996), *aff'g*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc).

Claim construction, however, "is not an obligatory exercise in redundancy." *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Rather, "[c]laim construction is a matter of [resolving] disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims . . . ." *Id.* A court need not "repeat or restate every claim term in order to comply with the ruling that claim construction is for the court." *Id.*

When construing claims, "[t]here is a heavy presumption that claim terms are to be given their ordinary and customary meaning." *Aventis Pharm. Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) (citing *Phillips*, 415 F.3d at 1312–13). Courts must therefore "look to the words of the claims themselves . . . to define the scope of the patented invention." *Id.* (citations omitted). The "ordinary and customary meaning of a claim term 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." *Phillips*, 415 F.3d at 1313. This "person of ordinary

skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.*

Intrinsic evidence is the primary resource for claim construction. *See Power-One, Inc. v. Artesyn Techs., Inc.*, 599 F.3d 1343, 1348 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1312). For certain claim terms, "the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Phillips*, 415 F.3d at 1314; *see also Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) ("We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history."). But for claim terms with less-apparent meanings, courts consider "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean . . . [including] the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id.*

B. Means-Plus-Function Claiming

A patent claim may be expressed using functional language. *See* 35 U.S.C. § 112 ¶ 6 (pre-AIA); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347–49 & n.3 (Fed. Cir. 2015) (en banc in relevant portion). Under 35 U.S.C. § 112 ¶ 6, a structure may be claimed as a "means . . . for performing a specified function," and an act may be claimed as a "step for performing a specified function." *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002). When it applies, § 112 ¶ 6 limits the scope of the functional term "to only the structure, materials, or acts described

in the specification as corresponding to the claimed function and equivalents thereof." *Williamson*, 792 F.3d at 1347.

But § 112 ¶ 6 does not apply to all functional claim language. There is a rebuttable presumption that § 112 ¶ 6 applies when the claim language includes "means" or "step for" terms, and a rebuttable presumption it does *not* apply in the absence of those terms. *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. These presumptions stand or fall according to whether one of ordinary skill in the art would understand the claim with the functional language, in the context of the entire specification, to denote sufficiently definite structure or acts for performing the function. *See Media Rights Techs., Inc. v. Capital One Fin. Corp.*, 800 F.3d 1366, 1372 (Fed. Cir. 2015) (noting § 112 ¶ 6 does not apply when "the claim language, read in light of the specification, recites sufficiently definite structure" (quotation marks omitted) (citing *Williamson*, 792 F.3d at 1349; *Robert Bosch, LLC v. Snap-On Inc.*, 769 F.3d 1094, 1099 (Fed. Cir. 2014))); *Williamson*, 792 F.3d at 1349 (noting § 112 ¶ 6 does not apply when "the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure"); *Masco Corp.*, 303 F.3d at 1326 (noting § 112 ¶ 6 does not apply when the claim includes an "act" corresponding to "how the function is performed"); *Personalized Media Commc'ns, LLC v. I.T.C.*, 161 F.3d 696, 704 (Fed. Cir. 1998) (noting § 112 ¶ 6 does not apply when the claim includes "sufficient structure, material, or acts within the claim itself to perform entirely the recited function . . . even if the claim uses the term 'means.'" (quotation marks and citation omitted)). *See also Williamson*, 792 F.3d at 1350 (noting "'[m]odule' is a well-known nonce word that can operate as a substitute for 'means' in the context of § 112, para. 6").

C. Indefiniteness

"[A] patent is invalid for indefiniteness if its claims, read in light of the specification

delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc*., 572 U.S. 898, 901 (2014). The claims "must be precise enough to afford clear notice of what is claimed," but that consideration must be made while accounting for the inherent limitations of language. *Id.* at 908; *see also Williamson*, 792 F.3d at 1352 ("Under 35 U.S.C. § 112, paras. 2 and 6, . . . if a person of ordinary skill in the art would be unable to recognize the structure in the specification and associate it with the corresponding function in the claim, a means-plus-function clause is indefinite."). "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

II. THE LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the art is the skill level of a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In resolving the appropriate level of ordinary skill, courts consider the types of and solutions to problems encountered in the art, the speed of innovation, the sophistication of the technology, and the education of workers active in the field. *Id.* Importantly, "[a] person of ordinary skill in the art is also a person of ordinary creativity, not an automaton." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007).

Here, G+ asserts a skilled artisan "would have had a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and three to four years experience in the design and development of wireless communications systems." Dkt. No. 98 at 1. Samsung does not dispute that skill level. Accordingly, the Court adopts G+'s characterization of a skilled artisan for its analysis.

III. U.S. PATENT 8,761,776

A. Background

In 3G wireless systems, terminal devices measure the signal quality of different potential cells and compare those measurements to the signal quality of the cell currently serving the device. *See* '776 Patent at 1:27–30. If the measured signal quality of a neighboring cell is "better" (as determined by the system settings) than the serving cell, the terminal will opt for the better quality cell. *See id.* at 1:30–33.

This process works by mapping the measured values of the serving and neighboring cells to "cell reselection assessment values," designated "R_s" and "R_n," respectively. *See id.* at 1:34–39. R_s is compared with each R_n, and the cells are ranked according to R values. *Id.* If the highest ranked cell is not the serving cell, the terminal moves to the best cell. *See id.* at 1:39–42.

In certain systems, the terminal calculates R_s as the sum of the measured signal quality of the serving cell ($Q_{meas,\ s}$) and a hysteresis parameter (Q_{hysts}). In other words,

$$R_s = Q_{meas,\ s} + Q_{hysts}.$$

See id. at 1:47–57. Similarly, the terminal calculates R_n for each neighboring cell as the difference between the measured signal quality of the cell ($Q_{meas,\ n}$) and a level offset parameter (Q_{offset}), so

$$R_n = Q_{meas,\ n} - Q_{offset}.$$

Id. After the terminal calculates R_s and each R_n, the terminal ranks all R values and determines whether to transfer to a new cell. *See id.* at 1:57–60. Because this process depends "on not only the radio quality of these cells but also on the value of Qoffset, the foregoing reselection method through ranking R values is also called an offset-based cell reselection method." *Id.* at 1:60–65. Terminals, however, only select the best cell using this method if the selection is performed among cells on the same frequency, because "inter-frequency measurement requires the terminal to switch

the resonant frequency of a receiver." *Id.* at 2:2–9.

The patent, however, purports to teach a method of reselection among cells on *multiple* frequencies using a "priority-based reselection method." According to that method, the terminal first selects cells on multiple frequencies with the same priority according to a priority-based reselection *principle*, and cells on multiple frequencies of the same priority become "same-priority cells." *See generally id.* at 2:36–67.

The patent only has three claims, all of which are at issue. Claim 1 recites the method and includes three of the five disputed terms from the '776 Patent:

> 1. A cell reselection method, by which a terminal, which is currently associated with a serving cell on a serving frequency with a first priority, performs reselection among cells on multiple frequencies, other than the serving frequency, with a second priority, the method including:
>
> setting the cells on multiple frequencies with the second priority as *same-priority cells*;
>
> selecting cells on multiple frequencies with the second priority according to a priority-based reselection principle when a terminal performs cell reselection; and
>
> selecting a cell as a reselected cell by the terminal from among the *same-priority cells* based on a best-cell reselection principle,
>
> wherein the *same-priority cells* include one of the following:
>
> cells on multiple frequencies with the second priority that is higher than the first priority;
>
> cells on multiple frequencies with the second priority that is lower than the first priority; and
>
> a serving cell, and cells on the serving frequency and on one or more frequencies having the same priority with the serving frequency,
>
> *wherein the priority of the same-priority cells is equal to the*

> *absolute priority of corresponding frequencies*, and
>
> wherein the best-cell reselection principle is an *offset-based cell reselection principle*.

'776 Patent at 6:58–7:16 (disputed terms italicized). Claim 2 is directed to a terminal that implements the method and includes first and second "reselection modules" used to select cells. *See id.* at 7:17–8:18.

B. Disputed Terms From the '776 Patent

1. "offset-based reselection principle" (Claims 1–2)

G+'s Construction	Samsung's Construction
"using Qoffset as a variable for reselection"	"Rs=Qmeas,s+Qhysts, Rn=Qmeas,n−Qoffset, wherein s stands for a serving cell, n stands for a neighbouring cell, Qmeas,s stands for a measured level of a serving cell, Qmeas,n stands for a measured level of a neighbouring cell, Qhysts stands for the hysteresis of a serving cell, and Qoffset stands for a level offset of a neighbouring cell. After the calculation is completed, the terminal will rank all R values. The one ranked first is the best cell, the terminal will select the best cell when performing reselection."

This dispute concerns lexicography. Samsung contends the specification provides an express definition for this term in the Background, which it proposes as its construction. Dkt. No. 101 at 1–2 (citing '776 Patent at 1:47–64). G+ argues Samsung's construction imports limitations, and the "offset-based reselection principle" requires only that Q_{offset} be used as a variable for reselection. *See* Dkt. No. 98 at 2–3. Further, G+ contends the specification does not define the term. *Id.*

The Court agrees with G+. "To act as its own lexicographer, a patentee must 'clearly set

forth a definition of the disputed claim term' other than its plain and ordinary meaning." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). Here, the last sentence of the cited passage links the disputed phrase not to the specific formula recited earlier, but on the radio quality of the neighboring cells and the value of Q_{offset}. *See* '776 Patent at 1:61–63 ("the difficulty of reselection among neighbouring cells lies on *not only the radio quality of these cells but also on the value of Qoffset*" (emphasis added)). Thus, the method is "called an offset-based cell reselection method." *Id.* at 1:63–65. This comports with the ordinary meaning of words making up the phrase—that is, "an offset-based cell reselection method" is "a reselection method based on an offset." That does not require the method to be based on *more* than Q_{offset}, nor does it exclude that possibility. This phrase is not clearly defining "offset-based cell reselection principle" to mean the specifically recited formula. Accordingly, the Court adopts G+'s construction for this term: "using Qoffset as a variable for reselection."[1]

2. "same-priority cells" (Claims 1–2)

G+'s Construction	Samsung's Construction
Plain and ordinary meaning	"cells assigned a same cell priority"

Samsung argues its construction "simply clarifies what the intrinsic record requires"—that to practice the claimed method, cells "must be assigned a priority in addition to the established priorities associated with the frequencies on which [they] operate." Dkt. No. 101 at 3. It points to alleged disavowal from the prosecution history. *Id.* at 4. G+ counters that Samsung's construction

[1] During the hearing, Samsung criticized G+'s construction for not "even contemplate[ing] calculating R values," Hr'g Tr., Dkt. No. 117 at 11:20–21, but G+ agreed "the best cell reselection principle is described by calculating the R values," *id.* at 15:2–4.

would confuse the jury and contradicts the claim language. Dkt. No. 98 at 4.

The Court rejects Samsung's construction for two reasons. First, although Samsung asserts the patent repeatedly teaches "setting" cells *to* a same priority, Dkt. No. 101 at 2, the patent never uses that language. Rather, the patent teaches "setting" cells *as* "same-priority cells." *See, e.g.*, '776 Patent at [57] ("The method includes: cells on multiple frequencies with the same priority *are set as* same-priority cells." (emphasis added)); *id.* at 4:18–21 ("[T]he present invention provides a technical solution for cell reselection, wherein cells on multiple frequencies with the same priority *are set as same-priority cells*." (emphasis added)). In other words, "same-priority cells" are simply a grouping of cells with the same priority into a logical "bucket." While the claims later limit the priority of "same-priority cells" to a value, *see* '776 Patent at 7:13–14, the claim language does not require that value be established through "assignment." Notably, neither example from the specification describes an "assignment" of a cell priority to the same-priority cells. *See id.* at 5:4–63.

Second, the Court is not persuaded by Samsung's "disavowal" argument. Samsung emphasizes two statements made during prosecution: (1) the cited reference's "disclosure of 'equal priority' relates to the priority of the frequency of the cell, rather than the priority of the cell"; and (2) "the priority of the frequency of the cell and the priority of the cell are distinct concepts." Dkt. No. 101 at 4 (citing Dkt. No. 98-5 at GCOM000891). In the same paragraph, the applicants wrote:

> Huawei does not disclose or suggest searching and ranking based on the priority of the cell. *In other words, Huawei does not disclose or suggest which cells are considered by the UE as cells of equal priority prior to ranking*. Accordingly, Huawei does not disclose or suggest, at least, "setting the cells on multiple frequencies with the second priority as same-priority cells[.]"

Dkt. No. 98-5 at GCOM000891–892 (emphasis added).

None of these statements are inconsistent with G+'s position. That is, nothing in these

statements requires the "same-priority cells" to be *assigned* a priority—only that they be considered equal. Consistent with that notion, the specification discloses which cells are considered as cells of equal priority prior to ranking. Moreover, these arguments were made with respect to the entire "setting" limitation, not just the phrase "same-priority cells."

The Court does not find clear and unmistakable disavowal justifying Samsung's construction that "same-priority cells" are cells that have been assigned a value. Accordingly, the Court rejects Samsung's construction and will give this term its plain and ordinary meaning.

3. "wherein the priority of the same-priority cells is equal to the absolute priority of corresponding frequencies" (Claims 1–2)

G+'s Construction	Samsung's Construction
Not Indefinite. Plain and Ordinary meaning	Indefinite

This dispute overlaps with the dispute discussed *supra* over "same-priority cells." Samsung argues a skilled artisan "would not understand how the priority of a cell relates to priority of the frequency, which are two distinct concepts." Dkt. No. 101 at 4–5. Moreover, says Samsung, because the patent describes the method as an improvement of a prior-art "priority-based reselection method," a skilled artisan would not understand that "priority of the same-priority cells" is the absolute priority of the corresponding frequency. *Id.* at 5 (citing Min Decl., Dkt. No. 98-3 ¶ 71).

This term is not indefinite. Although certain cells were known to have the "same priority," the *value* of that priority is not specified. Instead, it is generally referred to as a "second priority" relative to the "first priority" of a serving frequency. The disputed phrase gives the cells' priority a value—the absolute value of the corresponding frequencies. That answers the question asked by Samsung: How does the priority of a cell relate to the priority of the frequency? They are equal.

Despite its "indefiniteness" challenge, Samsung appears to have the same understanding

of the claim language. During the hearing, Samsung noted the concept of ranking based on frequency (rather than cell) was well-known in the prior art. *See* Hr'g Tr., Dkt. No. 117 at 27:10–12. It argued that, despite the prosecution-history statements that the cell priority and frequency priority are "distinct concepts," the disputed "wherein" clause effectively negates that distinctiveness by making them equal:

> [Y]ou have this specification purposefully not equating these two things saying—and then the claim language, when you get through the claim language you're creating this second same-priority cell, and then you get to this ['wherein'] clause, and now all of the sudden I'm going backwards, I'm equating the two, that's the problem. . . . So either you're conflicting with the absolute requirements of the spec and the claim and the prosecution history, or you're creating an element that's not even—who cares about it. The 'wherein' clause, why would you have it? If we're just going to do the ranking based on frequency, why have that clause?
>
> . . . [T]he whole point of the claim and this invention is the idea that we're going to create this second level of selection, same-priority cells, and from that create the best one. And now all of the sudden we hit the 'wherein' clause and we're going backwards, but we're equating the two again. So that's our fundamental problem.

Hr'g Tr., Dkt. No. 117 at 28:8–29:5. In other words, (1) grouping cells from same-priority frequencies into a "bucket," (2) setting the priority of the grouped cells as equal to the priority of the frequencies, and then (3) ranking the cells is functionally the same as ranking the cells based on the frequencies as disclosed in the prior art.

Although this may later prove a persuasive argument for invalidity, it's not persuasive here. Samsung urges the Court to ignore what appears to be an apparent meaning of the disputed phrase because it would result in a claim functionally the same as the prior art. Samsung contends that because this is the only apparent meaning of the phrase, the claim must be indefinite. The Court, however, knows of no binding authority supporting such reasoning. Accordingly, the Court rejects Samsung's indefiniteness challenge and will give this term its plain and ordinary meaning.

4. *"first reselection module, used to select cells on multiple frequencies, other than the serving frequency, with a second priority according to a priority-based reselection principle when a terminal performs cell reselection" (Claim 2)*

G+'s Construction	Samsung's Construction
Not Indefinite **Governed by 35 U.S.C. § 112(6).** **Function**: "selects cells on frequencies with higher priority based on the priority of frequencies" **Structure:** a processor or part of an integrated processor within the terminal operating executable code and comprises a combination of hardware and/or software, and equivalents thereof.	Indefinite. **§ 112 ¶ 6 governs this claim element**. **Function:** "selecting cells on multiple frequencies, other than the serving frequency, with a second priority according to a priority-based reselection principle when a terminal performs cell reselection" **Corresponding structure**: none.

The parties agree this term is governed by 35 U.S.C. § 112 ¶ 6 and generally agree on the claimed function, but disagree on the corresponding structure. According to Samsung, "the specification does not mention any structure that performs the recited function." Dkt. No. 101 at 6. G+ asserts that "module" refers to a processor and the specification discloses well-known techniques and algorithms for performing the function. Dkt. No. 98 at 8–9.

As an initial matter, the "wherein" clause following the recited "first reselection module" is important, as a skilled artisan would understand the *second* reselection module is selecting a best cell from the output of the *first* reselection module. *See* '776 Patent at 8:3–5. Accordingly, the Court concludes the claimed function is "selecting cells on multiple frequencies, other than the serving frequency, with a second priority according to a priority-based reselection principle when a terminal performs cell reselection, wherein the cells on multiple frequencies with the second

priority are same-priority cells."[2]

Regarding the corresponding-structure inquiry, the focus is not merely whether a structure can perform the recited function, but also whether the corresponding structure is "clearly linked or associated" with that function. *Medtronic*, 248 F.3d at 1311. Here, the Background generally explains the prior-art method of selecting a frequency (rather than cells on frequencies) as "firstly rank[ing] the frequencies based on their absolute priority and find[ing] out the frequency with top priority, and then select[ing] a cell on this frequency by the offset-based cell reselection method." *See* '776 Patent 2:5–10 (noting "[t]his reselection method is called a priority-based reselection method"). After setting forth several technical conditions that must be met, the patent elaborates:

> [I]f a cell on a frequency with higher priority meets the foregoing conditions and the terminal has camped in a serving cell for more than one second, then the terminal will perform reselection and transfer to this cell; [but] if no reselectable cell exist[s] on the serving frequency or on the frequencies having the same priority with the serving frequency, and no cell on the frequencies with higher priority meets the foregoing conditions . . . then the terminal will perform reselection and transfer to [a cell on a lower priority frequency].

'776 Patent at 2:10–35. In other words, the terminal should choose cells on higher-priority frequencies first, cells on same priority frequencies next, and cells on lower-priority frequencies last, provided all the other conditions are met.

This general explanation is consistent with the two examples in the Detailed Description. Example 2 explains selection to a frequency with a lower priority is an option because there is no frequency with a higher priority than the frequency on which the terminal resides, and the other cell on a same-priority frequency does not satisfy the reselection conditions. *Id.* at 5:42–49 (noting

[2] At the hearing, neither party objected to including the "wherein" clause as part of the identified function. *See* Hr'g Tr., Dkt. No. 117 at 35:16–25, 37:22–38:2.

cell C_b2_1, a cell on a frequency with the same priority as the serving frequency, "does not satisfy reselection conditions. As there is no frequency with priority higher than the priority of F_b1 here, the terminal needs to consider performing reselection among lower priority frequencies"). Example 1, however, goes no further than describing selection to cells on higher-priority frequencies than the serving frequency. *See generally id.* at 5:3–31. This makes sense: Because in Example 1 cells on higher-priority frequencies are available and meet the reselection conditions, there is no need to consider cells on frequencies with the same or lower priority as that of the serving frequency.

In addition to the general notion of choosing cells on higher-priority frequencies first, same-priority frequencies second, and lower-priority frequencies last, both the Background and examples describe different conditions that must be met for reselection. Generally, the signal level of the cell on a frequency ($S_{cell, x}$) must be greater than some threshold for the corresponding frequency ($Thresh_x$) within a certain time ($Treselection_{RAT}$). *See* '776 Patent at 2:9–21. For example, when considering reselection to a higher-priority frequency, a non-serving cell is only considered for reselection if

$$S_{nonServingCell, x} > Thresh_{x, high} \text{ within } Treselection_{RAT}.$$

See id.; *see also id.* at 5:13–21. Similarly, a non-serving cell is only considered for reselection to a lower-priority frequency if

$$S_{nonServingCell, x} > Thresh_{x, low} \text{ within } Treselection_{RAT}.$$

See id. at 2:30–41; *see also id.* at 5:46–52. Thus, the Court rejects Samsung's contention a skilled artisan "would not understand these disclosures as algorithms because they do not describe how priority-based reselection actually occurs." Dkt. No. 101 at 7.

Samsung alternatively argues "these disclosures correspond with [only] two of the three

possible situations for the recited function." Dkt. No. 101 at 7. Example 1, according to Samsung, only selects "cells on multiple frequencies with the second priority that is higher than the first priority," and Example 2 only selects "cells on multiple frequencies that is lower than the first priority." *Id.* Samsung contends the specification does not address selecting cells on frequencies having the same priority as the serving cell's frequency. *Id.*

The Court disagrees with Samsung for two reasons. First, Samsung ignores the language from Example 2 explaining *why* cells on a lower-priority frequency are even being considered—that the only cell on a *same-priority* frequency "does not satisfy reselection conditions" and "there is no frequency with priority higher than the priority" of the serving cell's frequency. '776 Patent at 5:45–49. In other words, Example 2 uses the "priority-based reselection principle" by considering higher-priority frequencies first (there were none), same priority cells next (the only cell didn't meet reselection conditions), before finally finding "same-priority cells" on the lower-priority frequencies. Example 1 also used the "priority-based reselection principle," but did not reach the same- or -lower-priority frequencies. Second, although Samsung correctly notes the specification does not disclose an express example of selection to cells on same-priority frequencies, the algorithm is the same as that used in the two express examples—that is, the signal level of a measured cell on the same-priority frequency must be greater than some threshold for the corresponding frequency within a certain time.

In sum, the Court finds sufficient structure corresponding to the recited function. That structure is "a processor programmed to:

(1) For any cells on multiple frequencies with the second priority when the second priority is higher than the first priority, set each cell that exceeds a threshold value for that cell's frequency within a measured time for cell reselection ($T_{reselection-RAT}$) as a "same-priority cell";

(2) If there are no "same-priority cells" after Step 1: For any cells on multiple frequencies with the second priority when the second priority is the same as the first priority, set each cell with a signal level exceeding a threshold value for that cell's frequency within the measured time for cell reselection ($T_{reselection_{RAT}}$) as a "same-priority cell";

(3) If there are no "same-priority cells" after Steps 1 and 2: For any cells on multiple frequencies with the second priority when the second priority is lower than the first priority, set each cell with a signal level exceeding a threshold value for that cell's frequency within the measured time for cell reselection ($T_{reselection_{RAT}}$) as a "same-priority cell."

5. "second reselection module, used to select a cell as a reselected cell from among the same-priority cells based on a best-cell reselection principle" (Claims 2)

G+'s Construction	Samsung's Construction
Not Indefinite **Governed by 35 U.S.C. § 112 ¶ 6.** **Function:** selects a cell as a reselected cell from among the same-priority cells based on a best-cell reselection principle. **Structure:** a processor or part of an integrated processor within the terminal operating executable code and comprises a combination of hardware and/or software, and equivalents thereof.	Indefinite **§ 112 ¶ 6 governs this claim element**. **Function:** "selecting a cell as a reselected cell from among the same priority cells based on a best-cell reselection principle" **Corresponding structure**: none.

As with the prior term, the parties mainly dispute whether the specification sufficiently discloses a corresponding structure. Samsung's briefing concerns the alleged absence of specialized hardware or software. Dkt. No. 101 at 8–9. At the hearing, however, Samsung alleged the validity of this term rises or falls with the validity of "first reselection module":

> [W]e're not disputing that the best cell reselection principle is not disclosed in terms of [an] algorithm—it is—but if you look at the claim language, the claim language says that you're reselecting a cell from among the same-priority cells, and that—those same-priority cells come from the result of the first reselection module. And

> because the first reselection module does not have an algorithm and does not have any disclosure of an algorithm, the second reselection module, which keys off of that one, also does not have the necessary algorithm.

Hr'g Tr., Dkt. No. 117 at 46:15–25.

As with the prior term, additional language should be added to the parties' agreed-to claimed function—specifically, the last "wherein" clause which limits the scope of best-cell reselection principle." The Court thus finds the function of the module as "selecting a cell as a reselected cell from among the same priority cells based on a best-cell reselection principle that is an offset-based cell reselection principle."

As for corresponding structure, column 1, lines 47–65 provide the algorithm. Using that algorithm, the Court construes the corresponding structure as: "a processor programmed to: (1) for each of the same-priority cells, calculate R=Qmeas−Qoffset, where Qmeas stands for a measured level of the cell and Qoffset stands for a level offset of the cell; (2) after the calculation is completed, rank all R values, where the one ranked first is the best cell; and (3) select the best cell."[3]

IV. U.S. PATENT 10,448,430

A. Background

In wireless communications, user equipment (UE) cannot uplink to a node until it synchronizes with the system using a "random access" process. '430 Patent at 1:22–25. The random access

[3] Column 1, lines 47–65 also include the step of calculating R_s for the *serving* cell. Because the "first reselection module" "select[s] cells on multiple frequencies, *other than the serving frequency*, with a second priority," '776 Patent at 7:21–23 (emphasis added), the serving cell cannot be a "same-priority cell." Accordingly, the algorithm need not include that step, which is consistent with both Example 1 and Example 2 in the specification. *See id.* at 5:25–8 (calculating and ranking $R_{C_a1_1}$, $R_{C_a1_2}$, and $R_{C_a2_1}$, but not $R_{C_b1_1}$), 5:57–60 (calculating and ranking $R_{C_c1_1}$ and $R_{C_c2_1}$, but not $R_{C_b1_1}$).

is a basic function, but as more people use wireless communication systems, the potential for conflict during the synchronization process increases. *See id.* at 2:16–31.

The '430 Patent "provides a random access method, device and system, intended to save . . . resources and meet requirements for a huge number of machine communications." *Id.* at 2:38–41. Rather than having a one-to-one relationship between UEs and random accesses, "one or more UEs in a UE group send a preamble to an eNB . . . so as to instruct the eNB to execute random accesses of some or all UEs in the UE group. Thus, a group of UEs only needs to occupy a [resource] in a random access, so that . . . resources can be greatly saved, thereby meeting requirements for a huge number of machine communications." *Id.* at 8:52–60.

B. Disputed Terms From the '430 Patent

1. "UE group" (Claims 1–18)

G+'s Construction	Samsung's Construction
"a set of one or more UE(s)"	"a plurality of UEs configured to jointly perform a single random access"

The claims repeatedly refer to "User Equipment (UE) in a UE group." *See, e.g.*, '430 Patent at 30:11; *see also id.* at 30:16–17 ("the first UE or a second UE in the UE group"). G+ argues a UE group can be only one UE, pointing to the specification's explanation that (1) the first UE may be at least one UE in the group; (2) the first UE can be representative of that group; and (3) the second UE may be all or some UEs in the UE group. Dkt. No. 98 at 12 (citing '430 Patent at 9:36–40, 11:59–64); *see also* Dkt. No. 106 at 5 (suggesting these excerpts amount to lexicography). G+ also points to Claim 1, which recites similar language. Dkt. No. 98 at 12. Samsung counters that such an interpretation is inconsistent with the ordinary meaning of "group" and the stated purpose of the patent. Dkt. No. 101 at 10.

The Court agrees with Samsung and construes "UE group" as "two or more UEs." The ordinary meaning of "group" requires more than one thing. *See, e.g.*, *group*, https://www.merriam-webster.com/dictionary/group, Dkt. No. 101-1 ("a number of individuals assembled together or having some unifying relationship"; "an assemblage of objects regarded as a unit"). G+ appears to agree with that notion by arguing lexicography, *see* Hr'g Tr., Dkt. No. 117 at 49:14–50:3, but points to nothing that clearly sets forth any intent to redefine the term. As Samsung correctly states, "that the second UE may contain, among other UEs, the first UE . . . does not otherwise indicate that there could be just one UE in a group." Dkt. No. 101 at 11. The invention's stated purpose only bolsters this conclusion. *See* '430 Patent at 2:16–31 (noting "[f]uture communication requirements for a huge number of machines" may not be sufficient for existing systems); *see also id.* at 8:51–60 (noting the embodiments "provide a random access method, device and system" so "a group of UEs only needs to occupy a PRACH resource . . . in a random access, so that PRACH resources can be greatly saved, thereby meeting requirements for a huge number of machine communications").

2. "pre-set UE number" (Claims 1, 4, 18)

G+'s Construction	Samsung's Construction
Not Indefinite. Plain and Ordinary meaning	Indefinite

Claim 1 requires sending a message that "comprises [1] a number of UEs having random access requests in the UE group or [2] a number of UEs contained in the UE group or [3] a *pre-set UE number.*" '430 Patent at 30:25–30 (emphasis added); *see also id.* at 32:51–56 (reciting the same language in Claim 18). Likewise, Claim 4 recites "wherein at least one of the preamble, the time domain resource or the frequency domain resource corresponds to [1] the number of UEs having random access requests in the UE group or [2] the number of UEs contained in the UE group or

[3] the *pre-set UE number*." *Id.* at 30:40–44 (emphasis added).

Samsung questions whether "pre-set UE number" pertains to a quantity, an identifier, or something else. Dkt. No. 101 at 11. It suggests this language is the result of a translation error, as a certified translation of the underlying foreign application shows the term referred to a preset quantity of UEs. *Id.* at 12. Asserting the term could include a quantity, an identifier, or something else, G+ accuses Samsung of confusing breadth with indefiniteness. Dkt. No. 98 at 13–14.

The Court disagrees that this term, as G+ argues, is "a broad term that could cover many things." *See* Hr'g Tr., Dkt. No. 117 at 68:18–19. While "number" could function as either an identifier or quantity depending on context, the scope of the claim would be fundamentally different depending on which definition a factfinder were to use. Although G+ suggests the term could have both or even other meanings, given the specificity with which other identifiers and quantities are described and claimed in the patent, a skilled artisan would not view this claim term as simply some number generally "associated with the UE." Ultimately, the Court is persuaded the term is either an identifier (e.g., a driver license number) or a quantity (e.g., the number of drivers), but not both.

The Court is of the opinion that a skilled artisan would understand the term as a quantity for at least three reasons. First, the surrounding claim language pertains to other quantities, and a skilled artisan would consider the meaning of the term considering that language. Second, given the nature of the invention as a whole—"*group based* random access method device and system"—quantities of UEs are important. Third, when the patent refers to an identifier, it does so with "identifier" or "ID." Accordingly, the Court construes "pre-set UE number" as "pre-set number of UEs."

3. "monitoring unit configured to: monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB" (Claim 18)

G+'s Construction	Samsung's Construction
Not Indefinite. **Governed by 35 U.S.C. § 112(6).** **Function:** monitor an RAR corresponding to the preamble and sent by the eNB. **Structure:** a processor or part of an integrated processor within the terminal operating executable code and comprises a combination of hardware and / or software, and equivalents thereof.	Indefinite. **§ 112(f) governs this claim element.** **Function:** "monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB" **Corresponding structure**: none.

Claim 18 is directed to a UE with:

> a sending unit and a monitoring unit,
>
> wherein the sending unit is configured to: send a preamble to an evolved Node B (eNB) over a time-frequency resource, the time-frequency resource comprising a time domain resource and a frequency domain resource;
>
> the monitoring unit is configured to: monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB; and
>
> the sending unit is further configured to: send a message 3 according to a Uplink (UL) grant allocated to the UE, wherein the message **3** comprises a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number.

'430 Patent at 32:41–56. The parties agree "monitoring unit" and "sending unit" are governed by 35 U.S.C. § 112(f) and agree on the recited function.[4]

[4] The '430 Patent has an effective filing data after the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 3, 125 Stat. 284, 285-93 (2011). Therefore, the current version of § 112 controls. *See Fleming v. Escort, Inc.*, 774 F.3d 1371, 1374 n.1 (Fed. Cir. 2014).

The sole dispute about "monitoring unit" is whether the specification identifies corresponding structure performing the identified function. Samsung contends the recited function is unconventional and a skilled artisan would not know how to implement it without additional guidance. Dkt. No. 101 at 13–14 ("the specification fails to disclose any computer algorithm or an integrated circuit design that could perform . . . group-based monitoring by one or more UEs"). G+ contends the specification points to at least two algorithms for performing the recited function. Dkt. No. 98 at 14–15 (pointing to, *inter alia*, '430 Patent at 2:62–3:4, 3:22–28).

In general, "the disclosure must be of 'adequate' corresponding structure to achieve the claimed function." *Williamson*, 792 F.3d at 1352 (citing *Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1311 (Fed. Cir. 2012)). Here, however, the claimed function does not concern "group-based monitoring by one or more UEs." Rather, the claimed function simply requires monitoring an RAR corresponding to a preamble, and the specification discloses two algorithms for doing so. *See* '430 Patent at 2:62–3:4, 3:22–28. Accordingly, the Court finds the corresponding structure as "a processor programmed to either (1) descramble a Cyclic Redundancy Check (CRC) of Downlink Control Information (DCI) for scheduling the RAR according to a pre-set RA-RNTI or an RA-RNTI corresponding to the preamble, and receive the RAR, the RAR including at least one TC-RNTI and/or at least one Uplink (UL) grant, or[5] (2) determine corresponding RA-RNTIs according to respective IDs and/or preambles, descramble a CRC of DCI for scheduling the RAR according to the corresponding RA-RNTIs, and receive corresponding RARs, the RAR including a TC-RNTI and/or a UL grant allocated to the first UE or second UE."

[5] "When multiple embodiments in the specification correspond to the claimed function, proper application of § 112, ¶ 6 generally reads the claim element to embrace each of those embodiments." *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999).

4. *"sending unit . . . configured to: send a preamble to an evolved Node B (eNB) over a time-frequency resource . . . comprising a time domain resource and a frequency domain resource; . . . and . . . further configured to: send a message 3 according to a Uplink (UL) grant allocated to the UE, wherein the message 3 comprises a number of UEs having a random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number" (Claim 18)*

G+'s Construction	Samsung's Construction
Not Indefinite. **Governed by 35 U.S.C. § 112(6).** **Function:** send a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource, and send a message 3 according to a Uplink (UL) grant allocated to the UE, the message 3 comprising a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number. **Structure:** a processor or part of an integrated processor within the terminal operating executable code and comprises a combination of hardware and / or software, and equivalents thereof.	Indefinite. **§ 112(f) governs this claim element.** **Function:** "send a preamble to an evolved Node B (eNB) over a time frequency resource, comprising a time domain resource and a frequency domain resource; and further send a message 3, comprising a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number, according to a Uplink (UL) grant allocated to the UE" **Corresponding structure**: none.

As with the prior term, the parties agree this is a means-plus-function term and generally agree on the recited function. Samsung contends "[t]he specification fails to provide sufficient corresponding structure for the claimed function." Dkt. No. 101 at 16. Although it acknowledges the disclosed embodiments may be implemented in a processor, Samsung claims the specification fails to disclose any algorithm or circuit design for the function. *Id.* (citing '430 Patent at 28:46–29:62). G+ does not point to an algorithm, but argues "[t]he '430 Patent describes the sending unit using terms of art that convey to a POSITA how to program the

processor to perform the sending function." Dkt. No. 98 at 17.

According to the specification, the physical structure of the "sending unit" is the combination of a processor and a transmitter, despite that "transmitter" is never expressly mentioned in the patent. The patent relates to wireless communication between a UE and an eNodeB. *See, e.g.*, '430 Patent at [57] (noting the eNB transmits the RAR in response to the preamble). The specification further provides, "[t]he UE includes: a sending unit . . . configured to: send a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource[.]" '430 Patent at 6:7–11; *see also id.* at 7:7–21 ("the sending unit is configured to: send a preamble over a frequency domain resource periodically"). A processor alone would be incapable of sending data over a time-frequency resource. Thus, a skilled artisan would interpret these and other excerpts as requiring a transmitter controlled by a processor to send the required message at the appropriate time. *See Atmel Corp. v. Info. Storage Devices*, 198 F.3d 1374, 1378 (Fed. Cir. 1999) ("For purposes of § 112 P 2, it is the disclosure in the specification itself, not the technical form of the disclosure that counts."); *see also* Part III *supra* (concluding a skilled artisan at the time of invention "would have had a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and three to four years experience in the design and development of wireless communications systems"). Put differently, "[i]t is well within the realm of common experience" that transmitters are used to communicate between UEs and eNodeBs. *Accord In re Kullmann*, 115 F.3d 942 (Fed. Cir. 1997) ("[W]e note that, in the medical imaging field, it is well within the realm of common experience that computers are used to generate images for display by mathematically processing digital input.").

However, sufficient disclosure of structure by itself is not enough as the specification must still link this structure to the claimed function. Here, the sending unit performs two distinct

functions: (1) sending a preamble; and (2) sending a "message 3." So far as sending the preamble, a well-known LTE function, the patent explains "[t]he UE includes: a sending unit . . . configured to: send a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource[.]" '430 Patent at 6:7–11; *see also id.* at 25:59–61"[I]in an embodiment, the sending unit 501 is configured to: send a preamble over a frequency domain resource periodically."); *id.* at 27:7–9 ("[I]n an embodiment, the sending unit 501 is configured to: send a preamble over a frequency domain resource periodically."). This links the first function to the "sending unit." For sending the "message 3," "[i]n an embodiment, the sending unit 501 may be further configured to: send a message 3 according to the UL grant allocated to the UE." *Id.* at 26:30–32.

Based on the forgoing, the Court finds the corresponding structure as "a processor connected to a transmitter, the processor programmed to, using the transmitter, send a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource, and send a message 3 according to a Uplink (UL) grant allocated to the UE, the message 3 comprising a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number."

V. U.S. PATENT 9,184,881

A. Background

The '881 Patent explains that, in some configurations of certain wireless networks, the number of allocated downlink sub-frames is greater than the number of allocated uplink sub-frames. In those configurations, the system may transmit acknowledgement (ACK) and no-acknowledgement (NACK) information with uplink data on the Physical Uplink Shared Channel (PUSCH). But if the control channel corresponding to the downlink data is not correctly detected,

the eNodeB might mistake an ACK for *other* data, which will cause delay as the system corrects the mistake. '881 Patent at 2:52–3:21. The patent teaches a specific method of sending the ACK/NACK of a plurality of downlink sub-frames on an uplink PUSCH that increases the feedback efficiency of the system and helps solve the problem of the loss of downlink data. *Id.* at 5:65–6:3.

B. Disputed Terms From the '881 Patent

1. *"a number value of the downlink sub-frame" (Claim 1)*

G+'s Construction	Samsung's Construction
Plain and Ordinary meaning	"a number identifying how many downlink sub-frames are used to transmit data"

The parties dispute whether this phrase covers (1) the number of sub-frames used to transmit data (as Samsung urges), or (2) in addition to the number of subframes, a specific sub-frame by number (G+'s position). Samsung argues the term warrants a "clarification" because "[t]he choice of words in the claim term is unclear." Dkt. No. 101 at 17. It then points to the specification's description that "the number of downlink sub-frames corresponding to the confirmation information" is sent with the data. *Id.* at 18 (citing '881 Patent at 7:24–40). G+ argues Samsung's construction is inconsistent with the evidence and suggests the term can mean either a quantity or a position. Dkt. No. 98 at 18–20.

For several reasons, the Court agrees with G+ that this term relates to a position in a frame. First, although Samsung correctly notes "the number of downlink subframes" appears throughout the specification, the disputed term includes the additional word "value" and refers specifically to "the sub-frame" (singular) rather than multiple "sub-frames." Moreover, the specification uses these phrases in different ways. For example, "in addition" to the "signaling representing the

number (k) of the downlink sub-frames,"

> the eNodeB determines *a set of number values* of all the downlink sub-frames corresponding to information which is fed back by the one uplink sub-frame according to a configuration pattern for the current number of downlink/uplink sub-frames, and *selects corresponding number values from the set* according to an amount of the data actually required to be transmitted to be carried in the DCI.

'881 Patent at 7:24–47 (emphasis added).

The claim language supports this conclusion by differentiating between the number of downlink subframes and the number *value* of the downlink subframes in the same limitation. Specifically, the claim language following the disputed phrase links the term to "the confirmation information." *Id.* at 11:12–14. Later, the limitation notes "the number of downlink subframes is equal to the number of the downlink subframes corresponding to the confirmation information." *Id.* at 11: 17–20. Thus, these claim terms presumptively have different meanings. *See Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008) ("Different claim terms are presumed to have different meanings.").

Samsung also points to the prosecution history as support for its construction. Dkt. No. 101 at 18. When distinguishing their invention over a cited reference (Gao), the applicants argued:

> the eNodeB can inform the user equipment how many downlink sub-frames are used to transmit the data (i.e., a number value of the downlink sub-frame) and the position of the downlink sub-frames which transmit data (i.e., continuous downlink sub-frames after the subframe carrying the downlink control information), which are both not disclosed by Gao.

'881 Patent File Wrapper, Dkt. No. 98-2 at GCOM000221–000222 (emphasis in original). Samsung understandably focuses on the first parenthetical, which it says defines the preceding phrase and conflicts with the specification.

But "[w]hen the prosecution history appears in conflict with the specification, any

ambiguity must be resolved in favor of the specification. The specification is the best source for understanding a technical term, to be supplemented, as needed, by the prosecution history." *Lydall Thermal/Acoustical, Inc. v. Fed.-Mogul Corp.*, 344 F. App'x 607, 614 (Fed. Cir. 2009) (citing *Biogen, Inc. v. Berlex Labs., Inc.*, 318 F.3d 1132, 1140 (Fed. Cir. 2003)).

Here, the Court finds no need to supplement the specification with the prosecution history.[6] Importantly, however, the applicants used both phrases in their prosecution-history argument, first referring to "a number value of the downlink subframe" and then to "the number of the downlink sub-frames," further showing a clear distinction between the two phrases.

Finally, for the same reasons set forth *supra*, the Court rejects that this term *also* refers to a quantity, as urged by G+. The distinction between "number of the downlink subframes" and "number value of the downlink subframe" is clear from the intrinsic record, and adopting a construction for the disputed term that would include both a quantity and a position would render other claim language superfluous. Accordingly, the Court construes this term as "a number identifying the downlink sub-frame."

2. "the downlink sub-frame" / "this downlink sub-frame" (Claims 1, 9)

G+'s Construction	Samsung's Construction
Not indefinite. Plain and Ordinary meaning	Indefinite

Samsung contends a skilled artisan would not know if the various references to "downlink sub-frame" in Claims 1 and 9 refer to the same or different subframes. Dkt. No. 101 at 19. Relying

[6] Even if it did find such a need, this is not clear lexicography because a skilled artisan would at least question whether the parentheticals were transposed. "[T]he position of the downlink sub-frames which transmit data" seems better suited to how the specification uses "number value," whereas "how many downlink sub-frames are used to transmit the data" better relates to "continuous downlink sub-frames after the subframe carrying the downlink control information."

on an expert declaration, it argues Claims 1 and 9 recite multiple possible antecedent bases for the terms at issue. *Id.* at 20–21 (citing Wicker Decl., Dkt. No. 98-4 ¶¶ 70–73). It also criticizes G+ for failing to explain how any of the "different types of 'the downlink subframe[s]' . . . relate to the one and only recitation of 'a downlink subframe' that appears in the claim 1 preamble." *Id.* at 21.

Samsung's position is not persuasive. For one, it ignores the surrounding claim language that provides the requisite clarity. *See, e.g.*, '881 Patent at 11:12–13 ("a number value of the down-link-subframe corresponding to the confirmation information"), 11:16–17 (the "plurality of continuous downlink sub-frames after the sub-frame carrying the downlink control information"); *id.* at 11:47 ("the sub-frame which transmits the data"). Perhaps Samsung's best argument relates to recitation of "this down-link subframe," *see, e.g.*, *id.* at 11:25, 11:34, 11:50, but Samsung does not show how even those references are unclear to a skilled artisan.

Tellingly, Samsung's expert on this issue makes no attempt to analyze the claim language from the perspective of a skilled artisan. Instead, he simply notes "the claims contain multiple recitations of the terms 'the downlink sub-frame' and 'this downlink sub-frame,'" and then concludes "there is no clarity as to whether those limitations refer to *the same or different downlink sub-frames*." Wicker Decl., Dkt. No. 98-4 ¶ 70 (emphasis in original). He further opines "a POSITA would be able to interpret the claims in multiple ways," but doesn't enumerate those "ways" nor how he reaches that conclusion. *See id.* ¶ 72.

Ultimately, Samsung and its expert attempt to shift their burden to G+, concluding Claims 1 and 9 are indefinite because they use "downlink sub-frame" in many different contexts. The Court, however, concludes Samsung has not carried its "clear and convincing" burden of showing this term is indefinite and will therefore give this term its plain and ordinary meaning.

3. "an amount of the confirmation information" (Claims 1, 9)

G+'s Construction	Samsung's Construction
Not indefinite. Plain and Ordinary meaning	Indefinite

In its briefing, Samsung argues a skilled artisan would not understand if "amount" refers to the volume of confirmation information or the number of distinct pieces of confirmation information. Prior to the hearing, however, the parties agreed this term is not indefinite and should be given its plain and ordinary meaning. Hr'g Tr., Dkt. No. 117 at 103:1–9.

VI. U.S. PATENT 10,736,130

A. The Disputed Term From the '130 Patent

1. "a processor arranged . . . " (Claim 20)

G+'s Construction	Samsung's Construction
Not Indefinite Not governed by 112(f) Plain and Ordinary meaning Plaintiff objects to this as Defendants identified nearly an entire claim and not a claim term for construction.	Indefinite § 112(f) governs this claim element. **Function**: "to execute the stored processor- executable instructions to perform steps of: sending K predefined sequences on M transmission symbols in a Transmission Time Interval (TTI) to send B-bit uplink control information, wherein M is a positive integer, K is an integer, 1≤K≤2B, B is an integer greater than or equal to 1, on each of the M transmission symbols, one of the K predefined sequences is sent, and each of the K predefined sequences has a length of N and is mapped to N subcarriers of the corresponding transmission symbols corresponding to the each of the K predefined sequence, wherein N=2n with n being a positive integer" **Corresponding Structure**: none

Relying on *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1315–16

(Fed. Cir. 2011), Samsung asserts "[t]he mere disclosure of a general-purpose processor is not sufficient structure" to avoid invoking 35 U.S.C. § 112(f).[7] Dkt. No. 101 at 24. "To hold otherwise," says Samsung, "would be contrary to Federal Circuit precedent because it would permit functional claiming of software by reciting that a 'processor' is 'configured' or 'operable' to perform those functions." *Id.* (citing *Williamson*, 792 F.3d at 1349).

But neither *Katz* nor *Williamson* support Samsung's position here. The *Katz* analysis cited by Samsung relates to whether there was corresponding structure—the second of *Williamson*'s two-step analysis. The *Katz* court recognized the limitations at issue were subject to § 112 ¶ 6. *See Katz*, 639 F.3d at 1313 (noting that, for the claims in means-plus-function format, "the [trial] court concluded that the claims were invalid for indefiniteness because the only corresponding structure disclosed in the specification was a general purpose computer and the specification did not disclose an algorithm by which the general purpose computer performed the recited function"). Samsung's citation to *Williamson* relates to the Federal Circuit's decision to "abandon characterizing as 'strong' the presumption that a limitation lacking the word 'means' is not subject to § 112, para. 6." *Williamson*, 792 F.3d at 1349. As noted in *Williamson*, § 112 ¶ 6 (or § 112(f)) does not apply when "the words of the claim are understood by persons of ordinary skill in the art to have sufficiently definite meaning as the name for structure." *Williamson*, 792 F.3d at 1349. The same is trye here as "processor" undoubtedly connotes structure to an electrical engineer, computer engineer, and computer scientist. The limitation includes even more "structure" in the form of a detailed algorithm. Finally, there is a rebuttable presumption that § 112(f) does not apply because the

[7] The '130 Patent has an effective filing data after the effective date of the Leahy-Smith America Invents Act. Therefore, the current version of § 112 controls. *See Fleming v. Escort, Inc.*, 774 F.3d 1371, 1374 n.1 (Fed. Cir. 2014).

limitation does not use "means." *Masco Corp.*, 303 F.3d at 1326; *Williamson*, 792 F.3d at 1348. Samsung has not rebutted that presumption. Accordingly, the Court concludes § 112(f) does not govern this claim term and will otherwise give the term its plain and ordinary meaning.

VII. U.S. PATENT 10,594,443

A. Background

The '443 Patent relates to a method for transmitting and receiving hybrid automatic repeat request (HARQ) information, '443 Patent at 1:16–20. This is a combination of forward error correction (FEC) and automatic repeat request (ARQ) error-control. In a typical system a receiving device (e.g., a terminal or base station) receives data from a sending device over several carriers. The receiving device feeds back HARQ information to the sending device, which indicates whether the transmission on the carriers is correct. The patent provides a method of improving system throughput relative to the prior art while reducing HARQ overhead. *Id.* at [57].

B. Disputed Terms From the '443 Patent

1. "blind detection" (Claims 8, 17)

G+'s Construction	Samsung's Construction
Plain and Ordinary meaning	"decoding on the premise of assuming k as a specific value and correspondingly assuming M as a specific value"

Claim 8 requires:

> receiving . . . M bits of HARQ information . . . ; the M bits of HARQ information being used to indicate whether N transmission blocks transmitted to the first node by the second node be correctly received by the first node; among the M bits, M2 bits being used to indicate positions of k erroneous transmission blocks in the N transmission blocks, M2≤M[.]

’443 Patent at 17:15–26. Under a certain condition—specifically, when M2=M—the claim requires “blind detection” to obtain the desired information. *Id.* at 17:27–30; *see also id.* at 18:55–58 (reciting, in Claim 17, “a processor configured to obtain the M bits of HARQ information through a blind detection”).

The parties dispute the scope of “blind detection.” According to Samsung, the patentee defined the term. Dkt. No. 101 at 27. Samsung acknowledges that “blind detection” techniques were known in the art, but contends those techniques would not work with the recited inventions. *Id.* G+, however, asserts the patentee did *not* define the term and Samsung’s proposed construction imports limitations into the claims. Dkt. No. 98 at 27. Moreover, G+ contends Samsung’s construction for the term would not work technically. *Id.*

Although there are scattered references to “blind detection” throughout, the patent first explains the term with any detail when describing the first embodiment:

> After receiving the HARQ information from the node 1, the node 2 performs decoding through *a blind detection*. The blind detection refers to that the node 2 performs decoding on the premise of assuming k as a specific value and correspondingly assuming M as a specific value. If the node 1 adds a cyclic redundancy check (CRC) code to the HARQ information, then the node 2 may judge whether the assumption concerning k and M is feasible by checking through CRC after decoding. If feasible, then the HARQ information as obtained after decoding is just the one as expected; otherwise, repeating the above steps by assuming k as other values until the node 2 is correctly decoded.

’443 Patent at 11:10–21 (emphasis added). The patent provides a similar description with reference to the fourth embodiment, but doesn’t use the phrase “blind detection” in that explanation. *Id.* at 13:7–18.

The Court does not find this language clearly sets forth a definition of the term. For one, the passage could reasonably be read as “[t]he blind detection <u>of this embodiment</u> refers to . . . .”

The patent's other scattered references in the summary do not suggest the blind detection of the first embodiment applies to all embodiments.

That said, the Court agrees this term requires a construction, but G+ does not propose one. Instead, it explains the *purpose* of blind detection is "to gather control information" and that it is "a well-known process." Dkt. No. 98 at 26. Having considered the parties' briefing and arguments during the hearing, the Court construes "blind detection" as used in these claims as "decoding based on one or more predefined rules using trial and error." In the first embodiment, for example, the predefined rules are the assumption of k as a specific value and the assumption of M as a specific value.

2. *"a length type of M2 including a first length type or a second length type; the first length type indicating a value of M2 being predefined, and the second length type indicating a value of M2 being determined based on k" (Claims 1, 8, 10)*

G+'s Construction	Samsung's Construction
Not Indefinite. Plain and Ordinary meaning	Indefinite

Prior to the hearing, the parties agreed this term is not indefinite and should be given its plain and ordinary meaning. *See* Hr'g Tr., Dkt. No. 117 at 109:1–10.

VIII. CONCLUSION

Disputed Term	The Court's Construction
U.S. Patent 8,761,776	
"offset-based reselection principle" (Claims 1–2)	"using Qoffset as a variable for reselection"
"same-priority cells" (Claims 1–2)	Plain and ordinary meaning

"wherein the priority of the same-priority cells is equal to the absolute priority of corresponding frequencies" (Claims 1–2)	Plain and ordinary meaning.
"first reselection module, used to select cells on multiple frequencies, other than the serving frequency, with a second priority according to a priority-based reselection principle when a terminal performs cell reselection" (Claim 2)	**§ 112 ¶ 6 Function:** "selecting cells on multiple frequencies, other than the serving frequency, with a second priority according to a priority-based reselection principle when a terminal performs cell reselection, wherein the cells on multiple frequencies with the second priority are same-priority cells" **§ 112 ¶ 6 Structure:** "a processor programmed to: (1) For any cells on multiple frequencies with the second priority when the second priority is higher than the first priority, set each cell that exceeds a threshold value for that cell's frequency within a measured time for cell reselection ($T_{reselection_{RAT}}$) as a "same-priority cell"; (2) If there are no "same-priority cells" after Step 1: For any cells on multiple frequencies with the second priority when the second priority is the same as the first priority, set each cell with a signal level exceeding a threshold value for that cell's frequency within the measured time for cell reselection ($T_{reselection_{RAT}}$) as a "same-priority cell"; (3) If there are no "same-priority cells" after Steps 1 and 2: For any cells on multiple frequencies with the second priority when the second priority is lower than the first priority, set each cell with a signal level exceeding a threshold value for that cell's frequency within the measured time for cell reselection ($T_{reselection_{RAT}}$) as a "same-priority cell."

"second reselection module, used to select a cell as a reselected cell from among the same-priority cells based on a best-cell reselection principle" (Claim 2)	**§ 112 ¶ 6 Function:** "selecting a cell as a reselected cell from among the same priority cells based on a best-cell reselection principle that is an offset-based cell reselection principle" **§ 112 ¶ 6 Structure: "**a processor programmed to: (1) for each of the same-priority cells, calculate R=Qmeas−Qoffset, where Qmeas stands for a measured level of the cell and Qoffset stands for a level offset of the cell; (2) after the calculation is completed, rank all R values, where the one ranked first is the best cell; and (3) select the best cell."
U.S. Patent 10,448,430	
"UE group" (Claims 1–18)	"two or more UEs"
"pre-set UE number" (Claims 1, 4, 18)	"pre-set number of UEs"
"monitoring unit configured to: monitor a Random Access Response (RAR) corresponding to the preamble and sent by the eNB" (Claim 18)	**§ 112(f) Structure:** "a processor programmed to either: (1) descramble a Cyclic Redundancy Check (CRC) of Downlink Control Information (DCI) for scheduling the RAR according to a pre-set RA-RNTI or an RA-RNTI corresponding to the preamble, and receive the RAR, the RAR including at least one TC-RNTI and/or at least one Uplink (UL) grant, or (2) determine corresponding RA-RNTIs according to respective IDs and/or preambles, descramble a CRC of DCI for scheduling the RAR according to the corresponding RA-RNTIs, and receive corresponding RARs, the RAR including a TC-RNTI and/or a UL grant allocated to the first UE or second UE."

"sending unit . . . configured to: send a preamble to an evolved Node B (eNB) over a time-frequency resource comprising a time domain resource and a frequency dome resource; . . . and . . . further configured to: send a message 3 according to a Uplink (UL) grant allocated to the UE, wherein the message 3 comprises a number of UEs having a random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number" (Claim 18)	**§ 112(f) Structure:** "a processor connected to a transmitter, the processor programmed to, using the transmitter, send a preamble to an eNB over a time-frequency resource, the time-frequency resource including a time domain resource and a frequency domain resource, and send a message 3 according to a Uplink (UL) grant allocated to the UE, the message 3 comprising a number of UEs having random access requests in a UE group or a number of UEs contained in the UE group or a pre-set UE number."
U.S. Patent 9,184,881	
"a number value of the downlink sub-frame" (Claim 1)	"a number identifying the downlink sub-frame"
"the downlink sub-frame" / "this downlink sub-frame" (Claims 1, 9)	Plain and ordinary meaning.
"an amount of the confirmation information" (Claims 1, 9)	Plain and ordinary meaning.
U.S. Patent 10,736,130	
"a processor arranged . . . " (Claim 20)	Not governed by 35 U.S.C. § 112(f). Plain and ordinary meaning.
U.S. Patent at 10,594,443	
"blind detection" (Claims 8, 17)	"decoding based on one or more predefined rules using trial and error"

"a length type of M2 including a first length type or a second length type; the first length type indicating a value of M2 being predefined, and the second length type indicating a value of M2 being determined based on k" (Claims 1, 8, 10)	Plain and ordinary meaning.

The Court **ORDERS** each party not to refer, directly or indirectly, to its own or any other party's claim-construction positions in the presence of the jury. Likewise, the Court **ORDERS** the parties to refrain from mentioning any part of this opinion, other than the actual positions adopted by the Court, in the presence of the jury. Neither party may take a position before the jury that contradicts the Court's reasoning in this opinion. Any reference to claim construction proceedings is limited to informing the jury of the positions adopted by the Court.

So ORDERED and SIGNED this 13th day of July, 2023.

RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE