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

COLLISION COMMUNICATIONS, INC.	§	
v.	§	CASE NO. 2:21-CV-308-JRG
NOKIA NETWORKS AND SOLUTIONS OY and NOKIA OF AMERICA CORPORATION	§	(LEAD CASE)
COLLISION COMMUNICATIONS, INC.	§	
v.	§	CASE NO. 2:21-CV-327-JRG
TELEFONAKTIEBOLAGET LM ERICSSON and ERICSSON INC.,	§	(MEMBER CASE)

CLAIM CONSTRUCTION ORDER

On August 18, 2022, the Court held a hearing to determine the proper construction of disputed terms in United States Patents No. 7,233,620, 7,593,492, 7,724,851, 9,814,071, 9,888,479 and 10,477,561. Before the Court is the Opening Claim Construction Brief (Dkt. No. 67) filed by Plaintiff Collision Communications, Inc. Also before the Court is the Responsive Claim Construction Brief (Dkt. No. 75) filed by Defendants Nokia Networks and Solutions Oy, Nokia of America Corporation (collectively, "Nokia"), Telefonaktiebolaget LM Ericsson, and Ericsson Inc (collectively, "Ericsson") as well as Plaintiff's reply (Dkt. No. 77). Further before the Court are the parties' Patent Rule 4-3 Joint Claim Construction Statement (Dkt. No. 60) and the parties' Patent Rule 4-5(d) Joint Claim Construction Chart (Dkt. No. 78). Having reviewed the arguments made by the parties at the hearing and in their claim construction briefing, having

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considered the intrinsic evidence, and having made subsidiary factual findings about the extrinsic evidence, the Court hereby issues this Claim Construction Memorandum and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015).

Table of Contents

I. BACKGROUND **3**
II. LEGAL PRINCIPLES **3**
III. AGREED TERMS **6**
IV. DISPUTED TERMS IN U.S. PATENT NO. 7,724,851 ..... **7**
1. "multiuser detection unit," "multiple user detector," "multiuser detector," "multiuser detecting unit," and "MUD" 8
2. "parameter estimating unit(s)" Terms 16
3. "time stamp information from each independent signal receiving collector's preprocessed signal" and "time stamps provided by said at least two parameter estimation units and said at least two preprocessing units" 21
4. "means for stacking each of said parameter estimate signals" 26
5. "means for including" Terms 35
6. "means for stacking said received signals" 40
7. "a stacking device for stacking measurements and combining parameters between each of said parameter estimating units" 43

V. DISPUTED TERMS IN U.S. PATENTS NO. 9,888,479 AND 10,477,561 ..... **48**
8. "[determining/determine] revised operating parameters for the [first/second] UE that minimize changes to" 49

VI. DISPUTED TERMS IN U.S. PATENT NO. 7,233,620 ..... **55**
9. "each of one or more interfering signals" 56

VII. DISPUTED TERMS IN U.S. PATENT NO. 7,593,492 ..... **64**
10. "multi-user detector decision unit using decision criteria to determine a selected multi-user detector" 65
11. "said design criteria" 74

VIII. CONCLUSION **74**

I. BACKGROUND

Plaintiff alleges infringement of United States Patents No. 7,233,620 ("the '620 Patent"), 7,593,492 ("the '492 Patent"), 7,724,851 ("the '851 Patent"), 9,814,071 ("the '071 Patent"),[1] 9,888,479 ("the '479 Patent") and 10,477,561 ("the '561 Patent") (collectively, the "patents-in-suit") (Dkt. No. 67, Exs. 1–5). Plaintiff asserts the '620 Patent, the '492 Patent, the '851 Patent, and the '071 Patent against Nokia. Dkt. No. 67 at 1 n.1. Plaintiff originally asserted all of the patents-in-suit against Ericsson. *Id.* The Court granted an unopposed motion to dismiss the '620 Patent and the '492 Patent as to Defendant Ericsson. *See* Dkt. No. 84; *see also* Dkt. No. 85, July 21, 2022 Order. For simplicity, the Court herein refers to "Defendants" even as to patents that are presently asserted against only Nokia.

II. LEGAL PRINCIPLES

"It 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.'" *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). "In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841 (citation omitted). "In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the

[1] The parties present no disputed claim terms as to the '071 Patent.

'evidentiary underpinnings' of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal." *Id.* (citing 517 U.S. 370).

To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See Phillips*, 415 F.3d at 1313; *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312–13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am.*

Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc. v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317 (citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too

broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

The Supreme Court of the United States has "read [35 U.S.C.] § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). "A determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citations and internal quotation marks omitted), *abrogated on other grounds by Nautilus,* 134 S. Ct. 2120. "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).

III. AGREED TERMS

In their April 14, 2022 Patent Rule 4-3 Joint Claim Construction and Prehearing Statement (Dkt. No. 60 at 2–3) and their June 23, 2022 P.R. 4-5(d) Joint Claim Construction Chart (Dkt. No. 78, Ex. A at 8, 13–15 & 32), the parties submit the following agreed-upon constructions:

Term	Agreed Construction
"independent signal collectors" ('851 Patent, Claims 1, 3)	"collectors that receive signals wherein the collection of signals do not span the same mathematical space"

"independent signal receiving collector" ('851 Patent, Claims 1, 6, 7) "independent of said first signal collector" ('851 Patent, Claims 2, 10)	"collector that receives signals wherein the collection of signals do not span the same mathematical space" "collector that receives signals that do not span the same mathematical space as the signals received by the first signal collector"
"A receiver for use in a digital communication system that includes <u>a multiple user detector for separating signals that interfere from a first user transmitter and a second user transmitter</u> in order to increase overall throughput and to increase the number of interfering users in a MUD system comprising:" ('851 Patent, Claim 2)	The underlined portion of the preamble is limiting
"A digital communication system that includes <u>a multiple user detector for separating signals that interfere from a first user transmitter and a second user transmitter</u> in order to increase overall throughput and to increase the number of interfering users in a MUD system comprising:" ('851 Patent, Claim 10)	The underlined portion of the preamble is limiting
"A method for enabling a receiving node to distinguish <u>information concurrently received from a plurality of transmitting nodes on a shared communication channel of a wireless digital network</u>, the method comprising" ('071 Patent, Claim 21)	The underlined portion of the preamble is limiting

IV. DISPUTED TERMS IN U.S. PATENT NO. 7,724,851

The '851 Patent, titled "Receiver with Multiple Collectors in a Multiple User Detection System," issued on May 25, 2010, and bears an earliest priority date of March 4, 2004. Plaintiff submits that "[t]he '851 patent is generally directed to increasing the number of users capable of

communicating over an interference-heavy cellular network by implementing a novel multi-user detection ('MUD') process." Dkt. No. 67 at 1. The Abstract of the '851 Patent states:

> A digital wireless communication system for increasing the number of users capable of communicating over a network permits multiusers to transmit information simultaneously on the same channel of frequency. The primary example of such a system would be that employing radio frequency transmissions, even optical transmissions; however, the invention will also apply to magnectic [*sic*] detections such as in the reading of information stored on a magnetic tape. It is possible to increase overall throughput in terms of total number of bits transmitted through the shared medium by all users of a multiple access system if the signals are allowed to interfere. The present invention provides a multiuser detection process and apparatus that is capable of pulling apart signals in heavy interference in real time by combining the signals received from two or more spatially sep[a]rated collectors or antennas. The present invention includes the step of taking more measurements of the received signal from two separate collections prior to definition of the multiuser algorithm parameters and combining the different collection of signals as one signal for multiple user detection processing.

1. "multiuser detection unit," "multiple user detector," "multiuser detector," "multiuser detecting unit," and "MUD"

"multiuser detection unit" '851 Patent, Claim 1 **"multiple user detector"** '851 Patent, Claims 2, 10 **"multiuser detector"** '851 Patent, Claims 2, 9 **"multiuser detecting unit"** '851 Patent, Claim 3 **"MUD"** '851 Patent, Claims 2, 10, 11	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"multiuser detection unit that receives signals that are not beamformed"	"multiuser detection unit that receives signals with all interference intact that are not beamformed and that are not spatially nulled"

Dkt. No. 60, Ex. A at 3; *id.*, Ex. B at p. 7 of 11; Dkt. No. 78, Ex. A at 6.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction: "multiuser detection unit that receives signals that are not beamformed."

(a) The Parties' Positions

Plaintiff argues that Defendants are proposing additional requirements that are not required. Dkt. No. 67 at 2. For example, Plaintiff argues that "[t]he specification . . . makes no mention of the MUD receiving signals with 'all interference intact.'" *Id.* Plaintiff also argues that, during prosecution, "[t]he inventors repeatedly and consistently distinguished the invention based on only beamforming." *Id.* Further, Plaintiff argues that "'spatial nulling' is just another name for beamforming," and "the 'no spatial nulling' statement [in the prosecution history] is just another way of saying the invention does not beamform, was not how [the] Thomas [reference] was distinguished, and is not a disclaimer." *Id.* at 3 (citations omitted). Finally, Plaintiff argues that "'all interference intact' is the expected result of not beamforming, and not the basis for distinguishing Thomas." *Id.* at 4.

Defendants respond that "the patentee clearly and unmistakably disclaimed a multiuser detection unit that receives signals that (i) are beamformed or spatially nulled or (ii) do not have all interference intact." Dkt. No. 75 at 13. For example, Defendants argue that "Collision's expert highlights that the '851 Patent specification disclaims beamforming, but the portion of the specification that he cites also expressly disclaims spatial nulling." *Id.* Defendants submit: "Collision argues including 'spatial nulling' in the construction is 'superfluous' because 'beamforming' and 'spatial nulling' are the same thing, but Defendants disagree that those terms are synonymous." *Id.* at 14 (citations omitted). Defendants further urge that "[t]he Court should

also adopt the requirement in Defendants' construction that the MUD receive signals 'with all interference intact' because Applicants clearly and unmistakably disclaimed systems that remove interference before the MUD." *Id.* at 14–15.

Plaintiff replies by reiterating that "spatial nulling" means beamforming, and Plaintiff argues that Defendants' arguments and evidence purportedly to the contrary do not support Defendants' position that "spatial nulling" is different from beamforming. Dkt. No. 77 at 1. Plaintiff also argues that, in the prosecution history cited by Defendants, the patentees did not disclaim removing interference but rather "merely explain[ed] why their invention does not form beams." *Id.*

At the August 18, 2022 hearing, Defendants argued that "beamforming" and "spatial nulling" are not synonymous because whereas beamforming emphasizes signals from a particular area, spatial nulling cancels out signals from a particular area. Nonetheless, Defendants proposed that Plaintiff could address Defendants' concerns about Plaintiff's proposed construction if Plaintiff stipulated that, as to the '851 Patent, spatial nulling is the same as beamforming and is disclaimed. Plaintiff responded that referring to only beamforming in the construction is appropriate because spatial nulling appears only once in the specification and is not explained.

(b) Analysis

Claim 1 of the '851 Patent, for example, recites (emphasis added):

> 1. A method for increasing overall throughput of a multiple access system, said system comprised of at least one transmitter for transmitting data signals using a single channel, and at least one corresponding receiver, the method comprising the steps of:
>
> receiving signals through at least two independent signal collectors for each receiver;
>
> processing each signal received by each signal receiving collector through a separate preprocessing unit including analog to digital signal conversion, each

> separate preprocessing unit providing processed digital signals from one of the collectors;
>
> connecting an [*sic*] separate parameter estimation unit to the output of each preprocessing unit to receive processed digital signals from one of the collectors;
>
> connecting an organizational unit accepting signal inputs from each of the parameter estimation units and processed digital signals from each of the preprocessing units;
>
> stacking said signals received from each of said parameter estimation units via the organizational unit into a vector measurement at each time sample;
>
> combining separate sets of parameter estimates received from each of said parameter estimation units into a single set in said organizational unit;
>
> transmitting said single set of parameters to a *multiuser detection unit*;
>
> outputting a symbol stream for each user from said *multiuser detection unit*; and
>
> using the following to stack the digital received signals into vector measurements at each time sample: time stamp information from each independent signal receiving collector's preprocessed signal.

The specification discloses:

> Using the present invention, two simultaneous collections are made of the received signal which is comprised of several signals added together, one from each of the simultaneously transmitting users. This means that two separate antennas or collectors would be maintained at the single base station receiver, which would then permit two simultaneous collections of the signal. Each collected signal at the base station would be time stamped before the signals are sent off to the MUD processing of choice; however, the two collectors need not be calibrated in any way. Moreover, the two collectors must not be processed together to create any sort of beam and must simply be treated as separate measurements for the collection step.
>
> When viewing the present invention, it is very instructive to see what a current receiver looks like, prior to the improvement of this invention. Typically the conventional receiver has a single collector (antenna) that collects the received signal or a set of antenna elements that collect the signal after having been formed into a beam via conventional beamforming processing techniques.

'851 Patent at 3:34–53.

The parties also discuss disclosure regarding "spatial nulling":

> The procedure in accordance with this invention is not beamforming or spatial nulling prior to sending the signal along for processing.

Id. at 5:46–48. This type of usage of "or" may or may not be understood as setting forth synonyms. This is the only usage of the phrase "spatial nulling" in the specification and does not establish whether or not "spatial nulling" is the same as "beamforming." *See Pause Technology LLC v TiVo Inc.*, 419 F.3d 1326, 1335 (Fed. Cir. 2005) (as to "fixed duration or 'time window,'" finding that "the use of the quotation marks and the context of the surrounding text shows that this phrase does not specify two alternative time intervals but simply describes in different words the same interval").

Plaintiff argues that "spatial nulling" is the same as "beamforming" and, moreover, Plaintiff argues that the patentee distinguished prior art references during prosecution by relying on beamforming, not "spatial nulling."

During prosecution of the '851 Patent, the patentee stated:

> The Thomas invention determines the required set of antenna patterns needed to spatially separate a collection of signals coming into the receiver from different transmitters. This is a scheme for adaptive *nulling/beamforming* in order to spatially "isolate" each received signal that originates from an individual transmitter so as not to allow the transmissions from other transmitters to enter the beam configured for the transmitter of interest.
>
> Applicants' invention does not form any sort of beam, rather, Applicants' invention will work well because it does not first try to form beams. It receives all of the signals at their fullest strength, *without trying to spatially null anything*.

Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 17 (emphasis added); *see id.* at 12 ("Applicants' invention specifically does not form a beam with the separate collectors."); *see also id.* at 15 ("Applicants' invention specifically does not form a beam."); *id.* at 19 ("Applicants' invention also does not form multiple different beams in space. Applicants' invention does not even form one beam in space.").

Plaintiff argues that "[t]he separate inclusion of 'no spatial nulling' in the construction is not just unnecessary and redundant, it is likely to confuse the jury, which may conclude that

'spatial nulling' and 'beamforming' are two different things." Dkt. No. 67 at 4 (citations omitted).

On one hand, the patentee referred to the claimed invention operating "without trying to spatially null anything," and in doing so the patentee distinguished the Thomas reference as being "a scheme for adaptive nulling/beamforming in order to spatially 'isolate' each received signal." Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 17. Even if the patentee distinguished the prior art reference on other grounds, a particular argument can potentially give rise to a disclaimer. *See Speedtrack, Inc. v. Amazon.com, Inc.*, 998 F.3d 1373, 1380 (Fed. Cir. 2021) ("An applicant's argument that a prior art reference is distinguishable on a particular ground can serve as a disclaimer of claim scope even if the applicant distinguishes the reference on other grounds as well.") (citation omitted). Also, unlike the *Lone Star* case cited by Plaintiff, Defendants' proposal of referring to spatial nulling in the construction does not merely repeat language that is already in the claim. *See Lone Star Tech. Innovations, LLC v. Asustek Computer Inc.*, No. 6:19-CV-59-RWS, 2020 WL 6811484, at *20 (E.D. Tex. July 31, 2020) (rejecting construction as "redundant, unnecessary and may cause confusion").

On the other hand, the reference to "adaptive *nulling/beamforming*" in this prosecution history supports Plaintiff's contention that the patentee referred to spatial nulling as being synonymous with, or as being a result of ("in order to"), the beamforming. Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 17 (emphasis added). The specification and the prosecution history demonstrate that the patentee used beamforming and spatial nulling as synonymous, at least within the context of the '851 Patent.

Defendants' expert opines:

> Spatial Nulling (Null Beam Forming) is different than beamforming because, in addition to adjusting the phase and gain of each antenna array element so the

> receiver will receive the strongest signal from the transmitter, additional electronic modifications are made to the antenna array to cancel out interference coming from a known direction when it is coming from a different direction than the desired transmitted signal. The result of adding these additional adjustments is to create a null reception area, which essentially ignores signals coming from this direction. This process is referred to as Spatial Nulling because the antenna array is creating a null space for receiving unwanted signals.

See Dkt. No. 75, Ex. 1, June 9, 2022 Lanning Decl. at ¶ 141.

The extrinsic "Godara" article relied upon by Defendants' expert, however, does not compel finding that the patentee used "beamforming" and "spatial nulling" to refer to different concepts. *See* Dkt. No. 75, Ex. 1, June 9, 2022 Lanning Decl. at ¶¶ 135–143; *see also id.*, App'x B, Lal C. Godara, *Applications of Antenna Arrays to Mobile Communications, Part I: Performance Improvement, Feasibility, and System Considerations* 1041 (Proceedings of the IEEE, Vol. 85, No. 7, July 1997).

On balance, Defendants do not persuasively demonstrate that the patentee disclaimed "spatially nulling" as something purportedly distinct from beamforming. The patentee's statements do not amount to a clear and unmistakable statement that the claimed invention excludes "spatial nulling." *See Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325–26 (Fed. Cir. 2003); *see also Golight, Inc. v. Wal-Mart Stores, Inc.*, 355 F.3d 1327, 1332 (Fed. Cir. 2004) ("Because the statements in the prosecution history are subject to multiple reasonable interpretations, they do not constitute a clear and unmistakable departure from the ordinary meaning of the term . . . .") (citation omitted); *Tech. Props. Ltd. LLC v. Huawei Techs. Co., Ltd.*, 849 F.3d 1349, 1357–58 (Fed. Cir. 2017) ("If the challenged statements are ambiguous or amenable to multiple reasonable interpretations, prosecution disclaimer is not established.").

To whatever extent spatial nulling may have a broader or different meaning in this technical field more generally, the intrinsic evidence here does not support finding any

disclaimer as to spatial nulling. Alternatively, in the context of this patent, any disclaimer of spatial nulling disclaimed no more than the disclaimer of beamforming.

As for Defendants' proposal of requiring that signals are received "with all interference intact," Defendants cite the following statement by the patentee during prosecution:

> Applicants' invention does not form any patterns from the set of collected signals. If a beam were to be formed first, there would be no invention. It would just be a beamformer followed by a MUD with appropriate parameter estimator, which is obvious to one skilled in the art.
>
> Applicants' invention also does not form multiple different beams in space. Applicants' invention does not even form one beam in space. Applicants' invention needs to feed the MUD with the received signal from multiple collection sites, *with all the interference intact* and with the appropriate parameter estimates that allow the received signal model to be defined to the level that the MUD receiver requires so that it can run as it is made to do.

Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 19 (emphasis added).

Although the patentee expressly referred to "feed[ing]" the multiple user detector "with all the interference intact," a fair reading of this statement in context is that this is a *result* of "not form[ing] multiple different beams in space." *Id.* This is a particularly appropriate finding because "interference" is an aspect of receiving that, at least at some level, is inherently outside of the control of the receiver. Rather, this prosecution history discusses how prior art references used beamforming and how the claimed invention does *not* use beamforming.

The Court therefore rejects Defendants' proposed construction and adopts the otherwise agreed-upon language proposed by the parties. The Court thus hereby construes **"multiuser detection unit," "multiple user detector," "multiuser detector," "multiuser detecting unit,"** and **"MUD"** to mean **"multiuser detection unit that receives signals that are not beamformed."**

2. "parameter estimating unit(s)" Terms

"parameter estimating unit(s)" **"parameter estimation unit(s)"** '851 Patent, Claims 1, 2, 3, 7, 8, 10	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning	"unit that estimates all values that would be required to write down the received signal equation as a summation of multiple transmitted signals, including the number of transmitted signals and any frequency offset, as well as the unique channel that each transmission went through to get to the receive antenna, and without any pre-ordained assumptions made as to the delays on each of the possible multipaths"

Dkt. No. 60, Ex. A at 4; *id.*, Ex. B at p. 7 of 11; Dkt. No. 78, Ex. A at 7.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction: "unit that estimates all values that would be required to write down the received signal equation as a summation of multiple transmitted signals, including the number of transmitted signals and any frequency offset, as well as the unique channel that each transmission went through to get to the receive antenna, and without any pre-ordained assumptions made as to the delays on each of the possible multipaths."

(a) The Parties' Positions

Plaintiff argues that these terms are well known, and "parameter estimat[ing/ion] units are simply devices that perform the well-known process of estimating parameters." Dkt. No. 67 at 5 (citation omitted). Plaintiff argues that the prosecution history cited by Defendants "is not lexicography because it provides a general description and exemplary characteristics of the parameter estimator and in no way defines a term with 'reasonable clarity, deliberateness, and

precision.'" Dkt. No. 67 at 6 (quoting *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994)). Plaintiff also argues that "Defendants' convoluted 66-word construction should be rejected because: it includes terms that are unclear and imprecise and that themselves require construction (e.g., 'possible multipaths,' 'unique channel,' and 'preordained assumptions'); includes a negative limitation ('without any preordained assumptions'); and is potentially confusing." Dkt. No. 67 at 7–8 (citing *Fractus, S.A. v. ZTE Corp.*, No. 2:17-CV-561-JRG, 2018 WL 4282783, at *30–*31 (E.D. Tex. Sept. 7, 2018)).

Defendants respond that "[t]he parameter estimation unit terms must be construed, and Defendant's construction adopted, because the Applicants made clear and unmistakable arguments differentiating this aspect of their invention over the prior art in order to overcome rejection and secure issuance of the patent." Dkt. No. 75 at 16. Defendants argue that "Applicants' emphasis on what the parameter/channel estimator 'needs to' do as compared to what the prior art 'channel estimator does not' do amounts to clear and unmistakable disclaimer." *Id.* at 17 (citation omitted).

Plaintiff replies that Defendants "stitch together three separate statements that span three pages in the prosecution history (8/20/09 OA Resp. at 8-10) in a transparent attempt to make it appear as if the inventor's general overview statements about the invention and [the] Yellin [reference] are somehow tied to the Examiner's rejection." Dkt. No. 77 at 2.

(b) Analysis

Claim 1 of the '851 Patent, for example, recites (emphasis added):

> 1. A method for increasing overall throughput of a multiple access system, said system comprised of at least one transmitter for transmitting data signals using a single channel, and at least one corresponding receiver, the method comprising the steps of:
>
> receiving signals through at least two independent signal collectors for each receiver;

> processing each signal received by each signal receiving collector through a separate preprocessing unit including analog to digital signal conversion, each separate preprocessing unit providing processed digital signals from one of the collectors;
>
> connecting an [*sic*] separate *parameter estimation unit* to the output of each preprocessing unit to receive processed digital signals from one of the collectors;
>
> connecting an organizational unit accepting signal inputs from each of the *parameter estimation units* and processed digital signals from each of the preprocessing units;
>
> stacking said signals received from each of said *parameter estimation units* via the organizational unit into a vector measurement at each time sample;
>
> combining separate sets of parameter estimates received from each of said *parameter estimation units* into a single set in said organizational unit;
>
> transmitting said single set of parameters to a multiuser detection unit;
>
> outputting a symbol stream for each user from said multiuser detection unit; and
>
> using the following to stack the digital received signals into vector measurements at each time sample: time stamp information from each independent signal receiving collector's preprocessed signal.

The specification discloses:

> In a multiuser detection based, multiple access (MA) system, the transmitted signals from multiple users are purposely made to interfere such that the transmitted signals can all be on the same channel, in the same time slot or frequency band. The signal parameter estimation device (*parameter estimator*) 208 calculates from input signals, using known training sequences or pilot tones, several parameters including for each user (transmitter), a time stamp, symbol timing offset relative to some internal clock, carrier phase offset relative to the internal oscillator at the receiver, any frequency offset or Doppler and multipath structure of the channel. The parameter estimation device 208 gives the impulse response of the channel associated with each transmitted signal 112, 114, and 116 from each transmitter, 102, 104, and 106, respectively. The function of one option for the parameter estimator 208 is described in detail in U.S. patent application Ser. No. 10/228,787 filed Aug. 26, 2002, the entire teachings of which are hereby incorporated by reference.

'851 Patent at 5:62–6:12 (emphasis added).

On one hand, Plaintiff cites patents held by Defendants as evidence that "parameter estimating" and "parameter estimation" have had known meaning in the relevant art. *See* Dkt. No. 67, Ex. 12, U.S. Patent No. 7,643,548 (Ericsson) ("Iterative Forward-Backward Parameter

Estimation"); *see also id.*, Ex. 13, U.S. Patent No. 7,916,810 (Nokia) ("Parameter Estimation for Adaptive Antenna System").

During prosecution, however, the patentee stated:

> Yellin's channel estimator is forced to estimate the channel amplitude from the suboptimal measurements made by the despreader filter process. Moreover, only the channel amplitudes are estimated, one for each pre-ordained assumption of a delay (multipath).
>
> Applicants' parameter estimator estimates all values that would be required to write down the received signal equation as a summation of multiple transmitted signals, so Applicants' channel estimator needs to estimate the number of transmitted signals, as well as the unique channel that each transmission went through to get to the receive antenna. No pre-ordained assumptions are made as to the delays on each of the possible multipaths. Applicants' parameter estimator estimates any frequency offset, which the Yellin channel estimator does not.
>
> * * *
>
> Note that Yellin's invention specifically computes channel amplitudes only, and is not a full parameter estimator as would be required to create the model of the received signal for most MUDs that would be used in Applicants' invention.

Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 10 & 15.

Plaintiff argues that these statements are part of a "general discussion," and "[t]his discussion is untethered to the Examiner's rejection or the claims, and never mentions the Examiner, any Examiner assertions, or the specific rejections or their grounds." Dkt. No. 67 at 6. At the August 18, 2022 hearing, Plaintiff argued that the purported disclaimer *precedes* the patentee's alternating discussion of a rejection based on prior art, followed by how the patentee's invention is different, followed by another rejection based on prior art, and so on.

These statements, however, specifically refer to "Applicants' parameter estimator," and these statements appear in a section that distinguishes between the Yellin reference and "the invention," and this section is preceded by a statement that the rejection in view of Yellin "is respectfully traversed." Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 10; *id.* at 8. Indeed,

the end of the second above-reproduced paragraph directly contrasts "Applicants' parameter estimator" with "the Yellin channel estimator." *Id.* at 10. These statements should be given effect in the Court's construction. *See Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed. Cir. 1995) ("Claims may not be construed one way in order to obtain their allowance and in a different way against accused infringers."). The *Genuine Enabling Technology* case cited by Plaintiff does not compel otherwise. *See Genuine Enabling Tech. LLC v. Nintendo Co.*, 29 F.4th 1365, 1375 (Fed. Cir. 2022) (finding disclaimer but also finding that the district court erred as to an additional disclaimer because "[t]he record does not support finding a separate and distinct disclaimer of claim scope").

Plaintiff's reliance on *Gemstar*, *Snik*, and *Genzyme* is likewise unavailing. *See Gemstar-TV Guide Int'l, Inc. v. Int'l Trade Comm'n*, 383 F.3d 1352, 1375 (Fed. Cir. 2004) ("Gemstar's statements in the prosecution history do not indicate a disavowal or disclaimer of claim scope . . . but merely provide an example to illustrate differences between the invention and the prior art.") (citation omitted); *see also Snik LLC v. Samsung Elecs. Co.*, No. 2:19-CV-00387-JRG, 2020 WL 6559685, at *9–*10 (E.D. Tex. Nov. 6, 2020) (statement that a prior art reference "did not teach the limitations in the pending claims" "d[id] not meet the high bar Defendants needed to establish a specific disclaimer"); *Genzyme Corp. v. Atrium Med. Corp.*, 212 F. Supp. 2d 292, 327–28 (D. Del. 2002) (certain features "'appeared' to be missing from the [prior art, but] they made no statement limiting the scope of their invention"). In the present case, the patentee specifically described "Applicants' parameter estimator" when distinguishing prior art. *See* Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 10 & 15 (reproduced above).

Finally, Plaintiff argues that including negative limitations would be vague and potentially confusing, but the *Fractus* case cited by Plaintiff addressed a different term in a

different patent and is unpersuasive. *See Fractus, S.A. v. ZTE Corp.*, No. 2:17-CV-561-JRG, 2018 WL 4282783, at *30–*31 (E.D. Tex. Sept. 7, 2018).

The Court therefore hereby construes **"parameter estimating unit(s)"** and **"parameter estimation unit(s)"** to mean **"unit that estimates all values that would be required to write down the received signal equation as a summation of multiple transmitted signals, including the number of transmitted signals and any frequency offset, as well as the unique channel that each transmission went through to get to the receive antenna, and without any pre-ordained assumptions made as to the delays on each of the possible multipaths."**

3. "time stamp information from each independent signal receiving collector's preprocessed signal" and "time stamps provided by said at least two parameter estimation units and said at least two preprocessing units"

"time stamp information from each independent signal receiving collector's preprocessed signal" '851 Patent, Claim 1	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning	"time stamp information at the signal collector from each independent signal receiving collector's preprocessed signal"
"time stamps provided by said at least two parameter estimation units and said at least two preprocessing units" '851 Patent, Claim 3	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning	"time stamps at respective signal collectors provided by said at least two parameter estimation units and said at least two preprocessing units"

Dkt. No. 60, Ex. A at 4; *id.*, Ex. B at p. 8 of 11; Dkt. No. 78, Ex. A at 9.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary constructions: "time stamp information, from the signal collector, for each independent signal receiving collector's preprocessed signal"; and "time stamps, from signal collectors, provided by said at least two parameter estimation units and said at least two preprocessing units."

(a) The Parties' Positions

Plaintiff argues that "[t]hese terms use ordinary language that will be readily understood by the jury," and "[b]ecause no disclaimer or lexicography requires the extraneous language proposed by Defendants, plain and ordinary meaning should apply." Dkt. No. 67 at 8. Plaintiff argues that "Defendants' cherry-picked language is not lexicography because it is not definitional," and "the inventors never distinguished any prior art based on their 'at each signal collector' statement or argued that a POSITA would not have been motivated to combine [the] Thomas [reference] with the AAPA [(applicant-admitted prior art)] on this basis." *Id.* at 9.

Defendants respond that "Applicants clearly and unmistakably disclaimed general time stamps, which are of 'no use' and are obvious over the prior art," and "Collision attempts to reclaim this disavowed subject matter by mischaracterizing the intrinsic record." Dkt. No. 75 at 18 & 19.

Plaintiff replies that the prosecution history cited by Defendants does not support Defendants' proposal of "at the signal collector" because "the inventors argued it would not be obvious to combine these references based on *timing*—not the *location* (*i.e.*, at the signal collector) of the time stamps." Dkt. No. 77 at 3.

(b) Analysis

Claim 1 of the '851 Patent, for example, recites (emphasis added):

> 1. A method for increasing overall throughput of a multiple access system, said system comprised of at least one transmitter for transmitting data signals using a single channel, and at least one corresponding receiver, the method comprising the steps of:
>
> receiving signals through at least two independent signal collectors for each receiver;
>
> processing each signal received by each signal receiving collector through a separate preprocessing unit including analog to digital signal conversion, each separate preprocessing unit providing processed digital signals from one of the collectors;
>
> connecting an [*sic*] separate parameter estimation unit to the output of each preprocessing unit to receive processed digital signals from one of the collectors;
>
> connecting an organizational unit accepting signal inputs from each of the parameter estimation units and processed digital signals from each of the preprocessing units;
>
> stacking said signals received from each of said parameter estimation units via the organizational unit into a vector measurement at each time sample;
>
> combining separate sets of parameter estimates received from each of said parameter estimation units into a single set in said organizational unit;
>
> transmitting said single set of parameters to a multiuser detection unit;
>
> outputting a symbol stream for each user from said multiuser detection unit; and
>
> using the following to stack the digital received signals into vector measurements at each time sample: *time stamp information from each independent signal receiving collector's preprocessed signal*.

The specification discloses:

> The method includes providing for two simultaneous collections of the signal by one user. Each collected signal is time stamped along with carefully merging of one or more collected signals to combine the signals into one effective multidimensional signal prior to processing in the multiple user detection process of choice.
>
> * * *
>
> Using the present invention, two simultaneous collections are made of the received signal which is comprised of several signals added together, one from each of the simultaneously transmitting users. This means that two separate antennas or collectors would be maintained at the single base station receiver, which would then permit two simultaneous collections of the signal. Each collected signal at the base station would be time stamped before the signals are sent off to the MUD processing of choice; however, the two collectors need not be calibrated in any way. Moreover, the two collectors must not be processed

> together to create any sort of beam and must simply be treated as separate measurements for the collection step.

'851 Patent at 3:11–16 & 3:34–46 (emphasis added).

During prosecution, the patent examiner rejected multiple claims because, as the patentee summarized the examiner's rejection, "the use of time stamps to determine signals of the same time would have been predictable to one of ordinary skill in the art":

> The Examiner asserts that the AAPA already discloses calculating time stamps for each user. Therefore, it would have been obvious to one of ordinary skill in the art to combine the prior art techniques of Thomas et al and the combination of AAPA and Yellin since both are related to MUD (i.e. decoding information transmitted in the sample channel), and the use of time stamps to determine signals of the same time would have been predicable to one of ordinary skill in the art.
>
> The use of time stamps in Applicants' invention is to know which part of the received signal at one collection site matches up with received signal at a different collection site to allow Applicants' device to stack up portions of the received signal that coincide with the same bit or symbol. Knowing the time each user transmitted its bit is actually of no use. *Applicants' device needs to know when the aggregate of all transmitted signals were received at each signal collector so Applicants can stack the correct parts of the signals collected at different collectors so that they roughly line up in time* so that the same bits are represented in each of the collections being stacked. Remember that it is necessary to turn multiple separate received signal models, r1=S1b, r2=S2b, etc. into one higher dimensional received signal model r=sB (all with the same b, r being the r1 and r2 stacked, and S being S1 and S2 stacked.) The MUD can understand this model and be tuned to process the received signal r to get the bits b. The time stamping need only be good enough to get a good alignment relative to the bit/symbols b. This is nowhere near the sort of timing synchronization needed to do beamforming.
>
> * * *
>
> Applicants' invention also does not require the level of coordination one would require to form beams from different collectors or calculate such beamformed channel estimates. The time stamp for our invention has to be only good enough to allow us to match up the different signals collected at the different receiver so that we are bit or symbol coincident, not even chip coincident, and certainly not precisely coincident (e.g. sample coincident with having many more samples per second than would be required by the nyquist sampling rule) as a beamformer would require.

Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 20–21 & 22 (emphasis added).

Plaintiff argues that the patentee distinguished the prior art based not on the location of the time stamp but rather on the signals being "roughly line[d] up in time" rather than requiring precise timing information. Dkt. No. 77 at 3. At the August 18, 2022 hearing, Plaintiff argued that the patentee explained why precise time stamp information is not necessary in the claimed invention and why a person of ordinary skill in the art therefore would not combine the cited references. Defendants persuasively argued, however, that the statements in this prosecution history regarding the level of precision do not undermine the other aspects of the patentee's explanation of these time stamps.

Nonetheless, Plaintiff persuasively argued at the August 18, 2022 hearing that time stamping need not necessarily occur at the signal collector itself. A fair reading of this prosecution history, therefore, is that the patentee explicitly relied not on what component applies the time stamps but rather on knowing "when the aggregate of all transmitted signals were received at each signal collector" to distinguish the cited references. Dkt. No. 67, Ex. 6, Aug. 20, 2009 Amendment at 20. This statement should be given effect in the Court's construction. *See, e.g., Southwall*, 54 F.3d at 1576. The claim scope can be properly clarified by requiring that the time stamps indicate when each signal was received at each signal collector.

Finally, as to Defendants' proposed construction for the disputed term in Claim 3 of the '851 Patent, Defendants do not justify their proposal of referring to "respective" signal collectors. As referenced in the disputed term, the claim already recites "at least two separate signal preprocessor units" and "at least two separate parameter estimation units," and the claim also recites "at least two independent signal collectors for collecting user transmitted signals."

The Court therefore hereby construes these disputed terms as set forth in the following chart:

Term	Construction
"time stamp information from each independent signal receiving collector's preprocessed signal"	**"time stamp information, from each independent signal receiving collector's preprocessed signal, that indicates when each signal was received at each independent signal collector"**
"time stamps provided by said at least two parameter estimation units and said at least two preprocessing units"	**"time stamps, provided by said at least two parameter estimation units and said at least two preprocessing units, that indicate when each user-transmitted signal was collected at each independent signal collector"**

4. "means for stacking each of said parameter estimate signals"

"means for stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector" '851 Patent, Claim 2	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term is subject to § 112(6). Function: "stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector" Structure: processor programmed with algorithm described at 7:33–8:3.	Means-plus-function Function: "stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector" Structure: no corresponding structure (indefinite)

Dkt. No. 60, Ex. A at 4–5; *id.*, Ex. B at p. 3 of 11; Dkt. No. 78, Ex. A at 9.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction for the corresponding structure (the parties agree that this is a means-plus-function term and the parties agree upon the claimed function): "stack measurements and parameters unit 354; and equivalents thereof."

(a) The Parties' Positions

Plaintiff argues that a person of ordinary skill in the art would have understood that the "stacking unit 354" performs the claimed function, and "[a]s the inventors explained, the 'stacking' operation is 'ordinary' and 'trivial,' and thus the steps involved would not require significant detailed disclosure to have been understood by a POSITA." Dkt. No. 67 at 11 (citation omitted). Plaintiff submits the opinions of its expert, arguing that "Dr. Hochwald's specification-annotated testimony is detailed and substantive, and more than suffices to demonstrate Defendants cannot meet their 'clear and convincing evidence' burden." *Id.* at 13; *see id.* at 13–15.

Defendants respond that "[t]he 'means for stacking' term is indefinite because there is no corresponding structure disclosed in the specification that is capable of (i) stacking each of said parameter estimate signals, (ii) based on a time stamp of each of said parameter estimate signals, and (iii) for generating a desired set of parameter estimating signals acceptable to said multiuser detector." Dkt. No. 75 at 2 (citation omitted). Defendants also argue that "the specification does not link the claimed stacking function to a processor," and "stacking unit 354 does not stack parameter estimate signals[,] [i]t stacks digital received signals using parameter estimation information." *Id.* at 2 & 3. "In other words," Defendants argue, "the specification describes using the parameter estimates to stack the digital received signals from the pre-processing units but never describes any algorithm for stacking parameter estimate signals, as required by the

claim." *Id.* at 3. Defendants argue that "Collision attempts to rewrite the claims to track the specification through expert testimony, but that testimony cannot be used to contradict the intrinsic record." *Id.* at 4 (citation omitted). Defendants argue: "Collision thus effectively argues that a POSITA would have been able to devise an algorithm for stacking, but it is irrelevant whether the required algorithm would have been simple for POSITA. The law requires that the algorithm be disclosed in the specification." *Id.* (citation omitted).

Plaintiff replies that "the specification links 'all' of the disclosed features, including the stacking function, to a programmed processor." Dkt. No. 77 at 4; *see id.* at 3–4. Plaintiff also argues that the specification discloses an algorithm for the entire function. *See id.* at 4–5.

(b) Analysis

Title 35 U.S.C. § 112(f) (formerly § 112, ¶ 6) provides: "An 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." "In exchange for using this form of claiming, the patent specification must disclose with sufficient particularity the corresponding structure for performing the claimed function and clearly link that structure to the function." *Triton Tech of Tex., LLC v. Nintendo of Am., Inc.*, 753 F.3d 1375, 1378 (Fed. Cir. 2014).

The parties agree that this term is a means-plus-function term governed by 35 U.S.C. § 112, ¶ 6. The parties also agree on the claimed function. The parties dispute whether the specification discloses corresponding structure for performing this claimed function.

Claim 2 of the '851 Patent recites (emphasis added):

> 2. A receiver for use in a digital communication system that includes a multiple user detector for separating signals that interfere from a first user transmitter and a

> second user transmitter in order to increase overall throughput and to increase the number of interfering users in a MUD system comprising:
>
> a first signal collector for collecting simultaneously first interfering signals from said first and second user transmitters, a first preprocessing unit for processing said received first interfering signals connected to the output of said first signal collector, and a first parameter estimating unit for generating first parameter estimate signal connected to the output of said first collector preprocessing unit;
>
> a second signal collector for collecting simultaneously second interfering signals from said first and second user transmitters physically separated from said first collector and independent of said first signal collector, a second signal processor for processing said received second interfering signals and a second signal parameter estimation unit for generating second parameter estimate signals; and
>
> organizing means connunicatively [*sic*] coupled to both outputs of said first collector preprocessor and said first collector parameter estimating unit and both outputs of said second signal preprocessing unit and said second collector parameter estimation unit, said organizing unit comprising a *means for stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector*.

The specification discloses:

> All of the down converted sampled collected signals from the different collectors are carefully merged in unit 354 where the additional information obtained from the parameter estimation units 336, 338, and 340 are used as a guide on how to combine the various collections into one effective multidimensional signal, 356, and one effective parameter estimation file sent on 358, that are ultimately sent to the selected MUD processor 360.

'851 Patent at 6:40–48. Early uses of reference numeral 354 in the specification appear as part of the disclosure of "stack measurement and parameter unit (organizational unit) 354" and "stack measurements and parameters unit 354," so the disclosures of "unit 354," "stacking unit 354," "sorting unit 354" are all directed to "stack measurements and parameters unit 354." *See id.* at 6:42, 6:66, 7:21–41, 7:67 & 8:7.

Plaintiff cites the following disclosure in the specification as corresponding structure for the claimed function:

> *Unit 354 combines the separate sets of parameter estimates received from each collector into one set of parameter estimates that are sent to a conventional MUD 360* on line 356 to create one set of parameters that describes, in the same multidimensional space, which is 6 dimensional for this example, the set of individual but interfering signals that have been added by the channel to create the single multidimensional received signal.
>
> The present invention is based on the premise that when creating a signal model using a matrix, S, to represent the received waveforms associated with each user transmitted waveforms, the rank of S determines the number of dimensions or, in other words, the number of orthogonal basis functions that are required to fully represent the individual but interfering signals. It is said that the set of interfering signals spans an x-dimensional space, where x is the rank of the S matrix referred to here. When the model is expanded to include several matrices stacked one upon the other, each due to a different collection site, (collector), the rank of the new, taller, signal matrix is often much higher. In the best case, the rank of the new taller signal matrix is the addition of each of the original S matrices. This is important because as the total number of interfering signals is increased, the rank of any individual S matrix will be significantly smaller than the number of users. This case presents a difficult problem to solve in the MUD which is commonly known by one educated in the state of the basic MUD literature as the complexity problem of the optimal MUD and the inoperability of short cut solutions that rely on S having full rank. Once one or more S matrices are stacked, the new rank is significantly increased, some times even resulting in fewer signals than rank dimension, allowing for very simple short cut MUD algorithms to work well. *This stacking is accomplished in the stacking unit 354, which uses the time stamp information and the parameter estimation information to stack the digital received signals into a vector measurement at each time sample*.

'851 Patent at 7:33–8:3 (emphasis added). This disclosure is set forth with reference to Figure 3, which illustrates the relationship between the parameter estimators and the "stack measurements and parameters unit 354." Figure 3 of the '851 Patent is reproduced here:

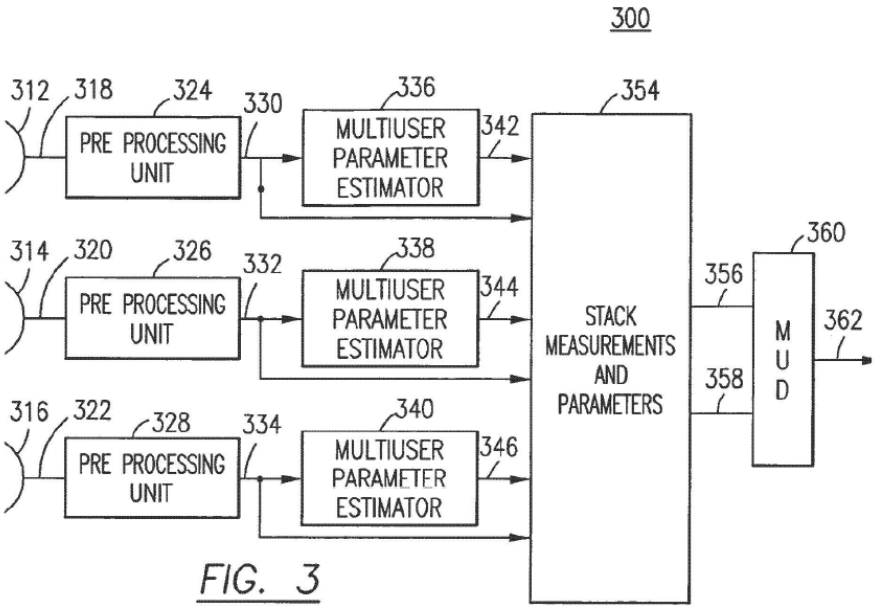

FIG. 3

The specification thus links the claimed function ("stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector") to the "stack measurements and parameters unit 354." The opinions of Plaintiffs' expert are further persuasive in this regard. *See* Dkt. No. 67, Ex. 8, Apr. 14, 2022 Hochwald Decl. at ¶¶ 67–75. The opinions of Defendants' expert to the contrary are unpersuasive. *See* Dkt. No. 75, Ex. 1, June 9, 2022 Lanning Decl. at ¶¶ 59–62. Indeed, the name of the element, "stack measurements and parameters unit 354," on its face refers to "stack[ing] . . . parameters." The linkage to the claimed function is thus apparent based on the face of the disclosed structure as well as based on the above-reproduced disclosure and accompanying figure. *See Triton*, 753 F.3d at 1378 (specification must "clearly link that structure to the function"). Defendants' argument that "[c]ombining separate sets of parameter estimates is not the same as stacking the received signals" (Dkt. No. 75 at 4) is thus unavailing because a fair reading of the intrinsic evidence is

that the claimed function of "stacking each of said parameter estimate signals" is clearly linked to the stack measurements and parameters unit 354.

At the August 18, 2022 hearing, Plaintiff had no objection to the Court's preliminary construction that the corresponding structure is "stack measurements and parameters unit 354; and equivalents thereof."

Defendants maintain that an algorithm is required. "In a means-plus-function claim in which the disclosed structure is a computer, or microprocessor, programmed to carry out an algorithm, the disclosed structure is not the general purpose computer, but rather the special purpose computer programmed to perform the disclosed algorithm." *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349 (Fed. Cir. 1999); *see Net MoneyIN Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1367 (Fed. Cir. 2008) (citing *WMS Gaming*); *Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1364 (Fed. Cir. 2012) ("Requiring disclosure of an algorithm properly defines the scope of the claim and prevents pure functional claiming."). At the August 18, 2022 hearing, Defendants argued for example that the specification lacks sufficient disclosure regarding what to do with the time stamps.

Here, the "stack measurements and parameters unit 354" is not a general-purpose computer but rather is a special-purpose component of the disclosed system. Therefore, the construction of corresponding structure need not set forth an algorithm.

Alternatively, even if the algorithm requirement were found to apply, the specification discloses an algorithm in prose. *See* '851 Patent at 7:33–8:3; *see also Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1312 (Fed. Cir. 2012) ("The specification can express the algorithm in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.") (citation and internal quotation marks omitted).

Defendants argue that the disclosure cited by Plaintiff lacks sufficient detail to constitute an algorithm for performing the claimed function, arguing that "[t]he question before us is whether the specification contains a sufficiently precise description of the 'corresponding structure' . . . not whether a person of skill in the art could devise some means to carry about the recited function." Dkt. No. 75 at 4 (quoting *Alfred E. Mann Found. for Scientific Research v. Cochlear Corp.*, 841 F.3d 1334, 1344 (Fed. Cir. 2016)). Defendants' argument is unavailing, particularly in light of the level of complexity of the claimed function. *Cf. Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1385 (Fed. Cir. 2011) ("[T]he amount of detail that must be included in the specification depends on the subject matter that is described and its role in the invention as a whole, in view of the existing knowledge in the field of the invention."). The opinions of Plaintiff's expert are further persuasive in this regard. *See* Dkt. No. 67, Ex. 8, Apr. 14, 2022 Hochwald Decl. at ¶¶ 36–57 & 67–75. The opinions of Defendants' expert to the contrary are unpersuasive. *See* Dkt. No. 75, Ex. 1, June 9, 2022 Lanning Decl. at ¶¶ 63–73.

Defendants' expert opines that there is no disclosed algorithm for "stacking . . . based on a time stamp" because the disclosed time stamps are for collector signals, rather than parameter estimate signals. *Id.* at ¶ 67. The specification, discloses, however, that the parameter estimate signals are related to the collector signals. *See* '851 Patent at 3:63–4:5. Further, the above-reproduced disclosure refers to stacking "at each time sample." '851 Patent at 7:67–8:3.

Finally, Defendants' expert opines that the patent fails to disclose "generating a desired set of parameter estimating signals" because "the sets of parameter estimates are distinct from the set of parameter estimating signals." *See* Dkt. No. 75, Ex. 1, June 9, 2022 Lanning Decl. at ¶ 67. Plaintiff's expert persuasively opines that a concatenation process stacks the parameter estimates so as to produce the parameter estimating signals. *See* Dkt. No. 67, Ex. 8, Apr. 14,

2022 Hochwald Decl. at ¶ 72; *see also* '851 Patent at 6:40–48 & 7:19–41. Also, the above-reproduced disclosure corresponds to the signals being "acceptable to said multiuser detector" because the specification discloses a "set of parameter estimates that are sent to a conventional MUD 360." *Id.* at 7:33–41.

The Court therefore finds that the corresponding structure is the stack measurements and parameters unit 354, and in so doing the Court is referring to that structure as it is disclosed in the specification, with all of the features and algorithms that are disclosed for the stack measurements and parameters unit 354. Defendants thus do not meet their burden to show indefiniteness. *See Sonix*, 844 F.3d at 1377. Indeed, much of Defendants' argument appears to be directed to the enablement and written description requirements, which Defendants have not shown are properly part of a corresponding structure analysis.

The Court thus hereby finds that **"means for stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector"** is a means-plus-function term governed by 35 U.S.C. § 112, ¶ 6, the claimed function is **"stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector,"** and the corresponding structure is **"stack measurements and parameters unit 354; and equivalents thereof."**

5. "means for including" Terms

"means for including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" ('851 Patent, Claim 9)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term is subject to § 112(6). Function: "including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" Structure: processor programmed with algorithm described at 7:33–8:3.	Means-plus-function Function: "including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" Structure: no corresponding structure (indefinite)

"means for including at least two matrices based on signals received from said first collector and said second collector, stacked upon each other, each due to a different collection site of said first collector and said second collector" ('851 Patent, Claim 11)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term is subject to § 112(6). Function: including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix Structure: processor programmed with algorithm described at 7:33–8:3.	Means-plus-function Function: including at least two matrices based on signals received from said first collector and said second collector, stacked upon each other, each due to a different collection site of said first collector and said second collector Structure: no corresponding structure (indefinite)

Dkt. No. 60, Ex. A at 6 & 7; *id.*, Ex. B at pp. 5–6 of 11; Dkt. No. 78, Ex. A at 10.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction (the parties agree that these are means-plus-function terms and the parties agree upon the claimed functions): "stack measurements and parameters unit 354; and equivalents thereof."

(a) The Parties' Positions

Plaintiff refers to its arguments as to the "means for stacking . . ." term discussed above, and Plaintiff argues that "[t]hese claim terms, too, are not indefinite for lack of sufficient structure, as the '851 patent discloses that the agreed-to functions are performed by a processor programmed with the algorithm set forth in 7:33–8:3." Dkt. No. 67 at 16 (citation omitted).

Defendants respond that "[t]hese terms are indefinite because there is no corresponding structure disclosed in the specification that is capable of performing the entirety of the required function, which requires including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix." Dkt. No. 75 at 10–11. Defendants also argue that "[e]ven if a processor was disclosed and clearly linked to 'including,' the term remains indefinite because the specification does not disclose an algorithm capable of performing the entirety of the required function." *Id.* at 11 (citation omitted).

Plaintiff replies: "The 'means for including' limitations are directed to stacking two matrices based on signals from different signal collectors (i.e., matrices of parameter estimates) to create a new signal matrix, and as such, the corresponding structure is substantially the same as the same programmed processor and stacking algorithm discussed above." Dkt. No. 77 at 5 (citations omitted). Plaintiff also argues, in an accompanying footnote, that "[i]n arguing that the new signal matrices cannot be stacked parameter estimates because the matrices must be based

on the signal received from the collectors, Defendants ignore that the parameter estimates *are* based on the signal received from the collectors." *Id.* (citations omitted).

(b) Analysis

Claim 9 of the '851 Patent, for example, depends from Claim 3, and Claims 3 and 9 recite (emphasis added):

> 3. A system for digital communications comprising:
> at least two transmitters operating on the same channel; and
> at least one receiver, said receiver comprising:
> at least two independent signal collectors for collecting user transmitted signals;
> at least two separate signal preprocessing units, each said signal preprocessing unit communicatively coupled to an output of a different one of said independent signal collectors;
> at least two separate parameter estimating units, each said parameter estimating unit communicatively coupled to an output of one of said signal preprocessing units, wherein each parameter estimation unit is coupled to a different preprocessing unit;
> an organizing unit communicatively coupled to the output of each said parameter estimation unit and each said preprocessing unit, said organizing unit comprising a stacking device for stacking measurements and combining parameters between each of said parameter estimation units; and
> a multiuser detecting unit communicatively coupled to an output of said organizing unit for receiving a multidimensional signal corresponding to said at least two transmitters where the multiuser detection procedure is defined, in part, from parameter estimates and time stamps provided by said at least two parameter estimation units and said at least two preprocessing units, wherein the time stamps include a time stamping of the incoming signals.
>
> * * *
>
> 9. The system of claim 3 further comprising:
> *means for including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix*; the rank of said new signal matrix being used to provide improved effective dimensions of wave forms that make up the received signal provided to said multiuser detector for processing.

The parties agree that these terms are means-plus-function terms governed by 35 U.S.C. § 112, ¶ 6. The parties also agree on the claimed function. The parties dispute whether the specification discloses corresponding structure for performing the claimed functions.

Plaintiff cites the following disclosure in the specification as corresponding structure for the claimed functions of the "means for including . . ." terms:

> *Unit 354 combines the separate sets of parameter estimates received from each collector* into one set of parameter estimates that are sent to a conventional MUD 360 on line 356 to *create one set of parameters that describes*, in the same multidimensional space, which is 6 dimensional for this example, *the set of individual but interfering signals that have been added by the channel to create the single multidimensional received signal*.
>
> The present invention is based on the premise that when *creating a signal model using a matrix, S, to represent the received waveforms associated with each user transmitted waveforms*, the rank of S determines the number of dimensions or, in other words, the number of orthogonal basis functions that are required to fully represent the individual but interfering signals. It is said that the set of interfering signals spans an x-dimensional space, where x is the rank of the S matrix referred to here. When the model is expanded to include *several matrices stacked one upon the other, each due to a different collection site, (collector)*, the rank of the new, taller, signal matrix is often much higher. In the best case, the rank of the new taller signal matrix is the addition of each of the original S matrices. This is important because as the total number of interfering signals is increased, the rank of any individual S matrix will be significantly smaller than the number of users. This case presents a difficult problem to solve in the MUD which is commonly known by one educated in the state of the basic MUD literature as the complexity problem of the optimal MUD and the inoperability of short cut solutions that rely on S having full rank. *Once one or more S matrices are stacked*, the new rank is significantly increased, some times even resulting in fewer signals than rank dimension, allowing for very simple short cut MUD algorithms to work well. *This stacking is accomplished in the stacking unit 354*, which uses the time stamp information and the parameter estimation information to stack the digital received signals into a vector measurement at each time sample.

'851 Patent at 7:33–8:3 (emphasis added).

The specification thus links the claimed function, "including at least two matrices based on signals received from each signal collector . . .," to the "stack measurements and parameters unit 354." The opinions of Plaintiffs' expert are further persuasive in this regard. *See* Dkt. No.

67, Ex. 8, Apr. 14, 2022 Hochwald Decl. at ¶¶ 76–86. The opinions of Defendants' expert to the contrary are unpersuasive. *See* Dkt. No. 75, Ex. 1, June 9, 2022 Lanning Decl. at ¶¶ 100–121.

Next, the "stack measurements and parameters unit 354" is not a general-purpose computer but rather is a special-purpose component of the disclosed system, so the corresponding structure need not include an algorithm. Alternatively, even if the algorithm requirement were found to apply, the specification discloses an algorithm in prose. *See* '851 Patent at 7:33–8:3; *see also Noah*, 675 F.3d at 1312 ("The specification can express the algorithm in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.") (citation and internal quotation marks omitted). Defendants thus do not meet their burden to show indefiniteness. *See Sonix*, 844 F.3d at 1377.

The Court therefore hereby construes these disputed terms as set forth in the following chart:

Term	Construction
"means for including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" ('851 Patent, Claim 9)	Means-plus-function term governed by 35 U.S.C. § 112, ¶ 6 Function: "including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" Structure: **"stack measurements and parameters unit 354; and equivalents thereof"**

"means for including at least two matrices based on signals received from said first collector and said second collector, stacked upon each other, each due to a different collection site of said first collector and said second collector" ('851 Patent, Claim 11)	Means-plus-function term governed by 35 U.S.C. § 112, ¶ 6 Function: "including at least two matrices based on signals received from said first collector and said second collector, stacked upon each other, each due to a different collection site of said first collector and said second collector" Structure: **"stack measurements and parameters unit 354; and equivalents thereof"**

6. "means for stacking said received signals"

"means for stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors" '851 Patent, Claim 10	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term is subject to § 112(6). Function: "stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors" Structure: processor programmed with algorithm described at 7:26–8:3.	Means-plus-function Function: "stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors" Structure: no corresponding structure (indefinite)

Dkt. No. 60, Ex. A at 6–7; Dkt. No. 78, Ex. A at 11.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction (the parties agree that this is a means-plus-function

term and the parties agree upon the claimed function): "stack measurements and parameters unit 354; and equivalents thereof."

(a) The Parties' Positions

Plaintiff refers to its arguments as to the "means for stacking . . ." term discussed above, and Plaintiff reiterates that an algorithm is disclosed and also that "'stacking' was a well-known operation." Dkt. No. 67 at 18.

Defendants respond that "[a]s with the previous ['means for stacking'] term, this 'means for stacking' term is indefinite because no corresponding structure capable of performing the entirety of the required function is disclosed in the specification." Dkt. No. 75 at 7.

Plaintiff replies that "Defendants merely cross-reference their prior arguments that there is no disclosure (1) linking a 'means for stacking' to a processor or (2) of any algorithm that stacks 'based on a time stamp.'" Dkt. No. 77 at 6 (citation omitted). "In addition," Plaintiff argues, Defendants' cross-referenced 'time stamp' argument is directed to stacking parameter estimate signals, not stacking received signals as recited in claim 10." *Id.* (citation omitted).

(b) Analysis

Claim 10 of the '851 Patent recites (emphasis added):

> 10. A digital communication system that includes a multiple user detector for separating signals that interfere from a first user transmitter and a second user transmitter in order to increase overall throughput and to increase the number of interfering users in a MUD system comprising:
>
> at least two transmitters operating on the same channel; and
>
> at least one receiver, said receiver comprising:
>
> a first signal collector, a first signal preprocessing unit connected to an output of said first signal collector and a first parameter estimating unit connected to an output of said first signal preprocessing unit;
>
> a second signal collector independent of said first signal collector, a second signal preprocessing unit connected to an output of said second signal collector and a second signal parameter estimation unit connected to an output of said second signal preprocessing unit; and

> organizing means communicatively coupled to both outputs of said first preprocessing unit and said first parameter estimating unit and both outputs of said second preprocessing unit and said second parameter estimation unit, said organizing unit comprising a *means for stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors*.

Substantially the same analysis applies for this term as discussed above for the other "means for stacking . . ." term. The opinions of Plaintiff's expert are further persuasive in this regard. *See* Dkt. No. 67, Ex. 8, Apr. 14, 2022 Hochwald Decl. at ¶¶ 90–96. Defendants thus do not meet their burden to show indefiniteness. *See Sonix*, 844 F.3d at 1377.

The Court therefore hereby finds that **"means for stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors"** is a means-plus-function term, the claimed function is **"stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors,"** and the corresponding structure is **"stack measurements and parameters unit 354; and equivalents thereof."**

7. "a stacking device for stacking measurements and combining parameters between each of said parameter estimating units"

"a stacking device for stacking measurements and combining parameters between each of said parameter estimating units" '851 Patent, Claim 3	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning If this term is subject to § 112(6): Function: "stacking measurements and combining parameters between each of said parameter estimating units" Structure: processor programmed with algorithm described at 7:26–8:3.	Means-plus-function Function: "stacking measurements and combining parameters between each of said parameter estimation units" Structure: no corresponding structure (indefinite)

Dkt. No. 60, Ex. A at 5; *id.*, Ex. B at 3–4; Dkt. No. 78, Ex. A at 12.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction: "Means-plus-function term governed by 35 U.S.C. § 112, ¶ / Function: 'stacking measurements and combining parameters between each of said parameter estimation units' / Structure: 'stack measurements and parameters unit 354; and equivalents thereof.'"

(a) The Parties' Positions

Plaintiff argues that Defendants cannot overcome the presumption against means-plus-function treatment for this non-means term. Dkt. No. 67 at 19. Plaintiff also argues that "[a]s the inventors confirmed during prosecution, the operation of 'stacking' was 'ordinary' and 'trivial,' and thus would have been well understood by a POSITA." *Id.* (citation omitted).

Plaintiff further argues that "Defendants miss the mark in arguing that 'device' in this claim term is a mere nonce word because the disputed term is '*stacking* device.'" *Id.* at 20 (citation omitted). Alternatively, Plaintiff argues that if this is found to be a means-plus-function term, the specification discloses an algorithm (as argued regarding the "means for stacking . . ." terms, above) and therefore the term is not indefinite. *Id.*

Defendants respond that "'a stacking device for stacking' is a nonce term that does not connote structure to a POSITA," and "[s]imilar to the other 'means for stacking' terms, this term is indefinite because there is no corresponding structure that is clearly linked to the required function." Dkt. No. 75 at 7. Defendants argue that "[t]he term 'stacking device' is not a term of art that a POSITA would recognize as having a definite meaning as connoting structure, nor does it appear anywhere in the specification other than in claim 3," and "neither Collision nor its expert present any evidence that the term 'stacking device' has ever been used (or understood) outside of the '851 Patent." *Id.* at 8 & 9 (citation omitted). Moreover, Defendants argue that "even if a processor was disclosed for 'stacking,' the term remains indefinite because the specification does not disclose an algorithm that is capable of both 'stacking measurements . . . *between each of said parameter estimation units*' and 'combining parameters *between each of said parameter estimation units*,' as required by the claims." *Id.* at 10.

Plaintiff replies that "[t]he inventors did not include 'means for' language, and a POSITA would have understood 'stacking device' in the context of the patent to be a well-known device that performs a concatenation operation on matrices and vectors." Dkt. No. 77 at 6 (citation omitted). Plaintiff cites the opinion of its expert that a person of ordinary skill in the art "would have understood that a 'stacking device' is a known device that performs the ordinary and trivial process of stacking values." *Id.* (citing Ex. 8, Apr. 14, 2022 Hochwald Decl. at ¶ 100). Plaintiff

further argues: "The '851 patent does not purport to have invented stacking or stacking devices. Instead, as Dr. Hochwald explained, the '851 patent used a known technique of stacking, but it improved upon multiuser detection by applying the stacking to parameter estimates of signals from multiple spatially separated collectors." Dkt. No. 77 at 7.

(b) Analysis

"[T]he failure to use the word 'means' . . . creates a rebuttable presumption . . . that § 112, para. 6 does not apply." *Williamson v. Citrix Online LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (citations and internal quotation marks omitted); *see Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1369 (Fed. Cir. 2022) ("[W]e presume that a claim limitation is not drafted in means-plus-function format in the absence of the term 'means.'") "When a claim term lacks the word 'means,' the presumption can be overcome and § 112, para. 6 will apply 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." *Williamson*, 792 F.3d at 1349 (citations and internal quotation marks omitted). "To overcome this presumption, [the challenger must] show, by a preponderance of the evidence, that persons of ordinary skill in the art would not have understood the [term] to connote structure in light of the claim as a whole." *Dyfan*, 28 F.4th at 1367.

Williamson, in an *en banc* portion of the decision, abrogated prior statements that the absence of the word "means" gives rise to a "strong" presumption against means-plus-function treatment. *Williamson*, 792 F.3d at 1349 (citation omitted). *Williamson* also abrogated prior statements that this presumption "is not readily overcome" and that this presumption cannot be overcome "without a showing that the limitation essentially is devoid of anything that can be construed as structure." *Id.* (citations omitted). Instead, *Williamson* found, "[h]enceforth, we

will apply the presumption as we have done prior to *Lighting World* . . . ." *Id.* (citing *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004)). In a subsequent part of the decision not considered *en banc*, *Williamson* affirmed the district court's finding that the term "distributed learning control module" was a means-plus-function term that was indefinite because of lack of corresponding structure, and in doing so *Williamson* stated that "'module' is a well-known nonce word." 792 F.3d at 1350.

Here, Claim 3 of the '851 Patent recites (emphasis added):

> 3. A system for digital communications comprising:
> at least two transmitters operating on the same channel; and
> at least one receiver, said receiver comprising:
> at least two independent signal collectors for collecting user transmitted signals;
> at least two separate signal preprocessing units, each said signal preprocessing unit communicatively coupled to an output of a different one of said independent signal collectors;
> at least two separate parameter estimating units, each said parameter estimating unit communicatively coupled to an output of one of said signal preprocessing units, wherein each parameter estimation unit is coupled to a different preprocessing unit;
> an organizing unit communicatively coupled to the output of each said parameter estimation unit and each said preprocessing unit, said organizing unit comprising *a stacking device for stacking measurements and combining parameters between each of said parameter estimation units*; and
> a multiuser detecting unit communicatively coupled to an output of said organizing unit for receiving a multidimensional signal corresponding to said at least two transmitters where the multiuser detection procedure is defined, in part, from parameter estimates and time stamps provided by said at least two parameter estimation units and said at least two preprocessing units, wherein the time stamps include a time stamping of the incoming signals.

This "stacking device for stacking . . ." term is recited "in a format consistent with traditional means-plus-function claim limitations," which weighs in favor of finding that the presumption against means-plus-function treatment for this non-means term has been rebutted. *Williamson*, 792 F.3d at 1350.

Plaintiff's argument that "stacking" has been well-known in the relevant art (*see* Dkt. No. 67 at Exs. 15 & 16) is unavailing because Plaintiff fails to persuasively demonstrate that the phrase "stacking device" connotes any known class of structures. *See, e.g., Diebold Nixdorf, Inc. v. Int'l Trade Comm'n*, 899 F.3d 1291, 1302 (Fed. Cir. 2018) ("there is no evidence—in the form of dictionary definitions or otherwise—that 'cheque standby unit' was reasonably well understood by persons of ordinary skill in the art to refer to a structure or class of structures") (citation omitted).

The *Power Integrations* case cited by Plaintiff does not hold otherwise. *See Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1365 (Fed. Cir. 2013) (finding § 112(6) does not apply where the claimed circuit "performs a straightforward function" and POSITA would have understood that the claim designated sufficiently definite structure). The *Blue Spike* decision cited by Plaintiff addressed a different term in a different patent and is unpersuasive. *Blue Spike, LLC v. Texas Instruments, Inc.*, No. 6:12-CV-499-MHS-CMC, 2014 WL 5299320 at *20 (E.D. Tex. Oct. 16, 2014) (presumption against means-plus-function treatment not rebutted as to "comparing device"). In short, Plaintiff does not show that a "stacking device for stacking . . ." is anything more than merely a "device for stacking . . . ."

The Court therefore finds that the presumption against means-plus-function treatment is rebutted, and the term "a stacking device for stacking measurements and combining parameters between each of said parameter estimating units" is a means-plus-function term governed by 35 U.S.C. § 112, ¶ 6. *See, e.g., Dyfan*, 28 F.4th at 1367 ("[The challenger] had to show, by a preponderance of the evidence, that persons of ordinary skill in the art would not have understood the . . . limitations to connote structure in light of the claim as a whole.").

The parties agree that the claimed function is "stacking measurements and combining parameters between each of said parameter estimation units." The parties dispute whether the specification discloses corresponding structure.

Substantially the same corresponding structure analysis applies here as is discussed regarding the "means for stacking . . ." and "means for including . . ." terms, above. The supplemental opinions of Plaintiff's expert as to the corresponding structure for "a stacking device for stacking . . ." are further persuasive. *See* Dkt. No. 77, Ex. 18, June 16, 2022 Hochwald Decl. at ¶¶ 14–18. Also, at the August 18, 2022 hearing, Plaintiff had no objection to the Court's preliminary construction that the corresponding structure is "stack measurements and parameters unit 354; and equivalents thereof."

The Court therefore hereby finds that **"a stacking device for stacking measurements and combining parameters between each of said parameter estimating units"** is a means-plus-function term, the claimed function is **"stacking measurements and combining parameters between each of said parameter estimation units,"** and the corresponding structure is **"stack measurements and parameters unit 354; and equivalents thereof."**

V. DISPUTED TERMS IN U.S. PATENTS NO. 9,888,479 AND 10,477,561

The '479 Patent and the '561 Patent are both titled "Method and System for Improving Efficiency in a Cellular Communications Network." The '479 Patent issued on February 6, 2018, and bears a filing date of October 22, 2013. The '561 Patent issued on November 12, 2019, and is a continuation of the '479 Patent.

Plaintiff submits: "The '479 and '561 patents share a common specification and are directed generally to improving operating efficiency of a base station in a cellular communications network. The patents accomplish this by measuring background interference

levels due in part to the signals generated in neighboring cells, and then transmitting to user equipment in the cell operating parameters that are selected according to the measured background interference to provide acceptable quality of service and to optimize use of available bandwidth." Dkt. No. 67 at 21.

The Abstract of the '479 Patent, for example, states:

> A method and system are described for improving operating efficiency and QoS in a cellular communications network. According to an exemplary embodiment, the method includes predicting background interference levels due at least partly to signals generated in neighboring cells, and transmitting operating parameters to user equipment that include power, frequency, and/or spectral efficiency parameters. The operating parameters are selected according to the predicted background interference to provide acceptable quality of service while also optimizing use of available bandwidth. The method further includes updating the background interference predictions, and transmitting revised operating parameters to the user equipment according to rules that minimize changes to operating parameters that strongly affect background interference in neighboring cells, such as power levels and frequencies, thereby minimizing background interference fluctuations. Power levels for user equipment entering the cell can be initially minimized, and then slowly ramped to an optimal level. SPS can be implemented.

8. "[determining/determine] revised operating parameters for the [first/second] UE that minimize changes to"

"[determining/determine] revised operating parameters for the [first/second] UE that minimize changes to" '479 Patent, Claims 1, 12, 23 '561 Patent, Claims 1, 13, 25	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning	"[determining/determine] revised operating parameters for the [first/second] UE that result in the smallest possible change to"

Dkt. No. 60, Ex. A at 7–8; *id.*, Ex. B at 10 of 11; Dkt. No. 78, Ex. A at 18 & 25.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction: "Plain and ordinary meaning."

(a) The Parties' Positions

Plaintiff argues that "'minimize'—a term that the jury will readily understand—is used in the claims in its plain and ordinary sense, and does not require construction," and "[t]he specification confirms that 'minimize' is used in accordance with its plain, everyday meaning (i.e., to have little or no effect) . . . ." Dkt. No. 67 at 21 (citations omitted). Plaintiff also argues: "Defendants' construction should also be rejected because the phrase 'the smallest possible change' injects ambiguity and could potentially confuse the jury. What makes a change 'possible'? And what exactly is the smallest possible change? Zero? Slightly more than zero? How much more? By contrast, the jury is more than capable of understanding 'minimize.'" *Id.* at 22.

Defendants respond that "Plaintiff contends for the first time in its brief that the plain meaning of 'minimize' is 'to have little or no effect,'" and Defendants argue that "[t]he plain meaning of minimize is to 'reduce to a minimum' or 'reduce to the smallest possible amount.'" Dkt. No. 75 at 28. Defendants also argue that "Plaintiff's construction of 'minimize' includes a term of degree, i.e., 'to have little . . . effect' and the specification provides no guidance on how to apply this phrase." *Id.*; *see id.* at 29. Defendants argue that "Plaintiff points to several embodiments in the specification, but none support its position." *Id.* Finally, Defendants submit that "plaintiff did not offer an expert opinion supporting its position that a POSITA cannot determine the configuration of parameters that would result in the lowest change to interference." *Id.* at 30.

Plaintiff replies that "[g]iven that 'minimize' is an everyday term that jurors will readily understand, there is no need for the Court [t]o go any further and there is no[] need to provide an explicit definition—plain meaning should apply." Dkt. No. 77 at 7–8. Plaintiff also argues that "the intrinsic record confirms that minimize is used in a way consistent with its plain meaning." *Id.* at 8 (citations omitted).

At the August 18, 2022 hearing, Defendants argued that Plaintiff's proposed interpretation of these terms would render these claims indefinite. Plaintiff responded that because Defendants did not propose or argue indefiniteness, Defendants have waived any indefiniteness argument. Defendants replied by highlighting a portion of their responsive claim construction brief arguing: "Plaintiff contends for the first time in its brief that the plain meaning of 'minimize' is 'to have little or no effect.' At the outset, Plaintiff's new construction should be rejected because it would render the claim indefinite." Dkt. No. 75 at 28.

(b) Analysis

Claim 1 of the '479 Patent recites (emphasis added):

> 1. A method of improving background interference level predictions in a cellular communications system including at least a first and second base station ("BS") each serving respective first and second cells, the method comprising:
>
> determining a background interference level received at the first BS caused at least in part by wireless signals generated by a second user equipment ("UE") served by the second cell;
>
> determining a background interference level received at the second BS caused at least in part by wireless signals generated by a first UE served by the first cell;
>
> *determining revised operating parameters for the first UE that minimize changes to the background interference level received at the second BS;*
>
> *determining revised operating parameters for the second UE that minimize changes to the background interference level received at the first BS;*
>
> wherein the revised operating parameters for the first UE and the second UE include at least one of transmission power, communication frequency, time slot, spreading code, and spectral efficiency parameters;
>
> transmitting the respective revised operating parameters to the first UE and the second UE; and

> predicting a future background interference level at each of the first and second BS based on the respective determined background interference level and the revised operating parameters.

The specification discloses:

> Embodiments improve the accuracy of Signal to Interference and Noise ("SINR") predictions made by the base stations ("BS's") by *reducing the fluctuation of the background interference*, so that current measurements of background interference are good predictors of future levels of background interference.
>
> * * *
>
> [R]evised operating parameters are selected according to base station operating rules that specify a preference for making changes primarily or exclusively to those UE operating parameters that have little or no effect on background interference in neighboring cells, for example by *minimizing changes* to the power levels, frequencies, time slots, and spreading codes used by the user equipment, thereby *minimizing fluctuations of background interference levels* 206.
>
> * * *
>
> [I]f a group of neighboring base stations all revise their operating parameters according to base station operating rules that specify a preference for changing only those parameters that have minimal effect on background interference, then *the background interference experienced by the base stations will be more constant*, and hence the predictions of future background interference and SINR will be more accurate, allowing selection of more efficient operating parameters.

'479 Patent at 5:59–64, 6:1–10 & 6:30–38 (emphasis added); *see id.* at 6:24–25 ("some operating parameters have little or no effect on background interference in neighboring cells").

Whereas "minimize" is well understood in common parlance, Defendants' proposal of requiring achieving the "smallest possible change" would, in essence, requiring proving a negative, namely that there is no possible change that is smaller. Thus, not only is Defendants' proposal absolutist, Defendants' proposal appears to require proving something that, at some theoretical level, is inherently unknowable. The general-purpose dictionary definitions cited by Defendants do not resolve this difficulty because those definitions do not account for the impracticality of determining what is "possible" in the technical context here at issue, wherein

signal distortions are unpredictable and are dependent on environmental and operating conditions that, to at least some extent, are outside the control of the system. *See* Dkt. No. 75, Ex. 3 at pp. 44–48 of 52, *The New Shorter Oxford English Dictionary on Historical Principles* 1781 (1993) ("[r]educe to the smallest possible amount, extent, or degree"); *id.*, at pp. 49–52 of 52, *Collins Mini English Dictionary* 373 (5th ed. 2013) (defining "minimize" as "reduce to a minimum; belittle"; defining "minimum" as "least possible (amount or number)"). Indeed, one of Defendants' own cited dictionaries hints at this difficulty with Defendants' proposal, including a definition of "minimize" as "[a]ttain a minimum value" and including a definition of "minimum" as "[t]he smallest amount or quantity possible, usual, attainable, etc." *Id.* at pp. 47–48, *The New Shorter Oxford English Dictionary on Historical Principles* 1781–82 (1993).

Moreover, whereas Defendants urged at the August 18, 2022 hearing that "minimize" is a term of degree that would be indefinite if not construed to have an objective meaning, Defendants' own expert acknowledges that "[t]he concept of minimization is well known in science and mathematics, and is something a POSA would be familiar with":

> A POSA would know from introductory calculus that a function's minimum is at its lowest point. Similarly, a POSA would understand from a university-level adaptive control theory class that minimizing an output (here, background interference at a neighboring base station) based on a metric or cost function (here, change in background interference level at a neighboring base station) is done by finding the input among all possible inputs (here, the revised operating parameters) that results in the smallest change (or variance) in the output (here, minimizing the change in background interference level at a neighboring base station). This class of adaptive control system is referred to as "minimum variance control". Therefore, "minimizing changes" in the claims requires determining the revised operating parameters that result in the smallest possible change to the background interference level at a neighboring base station.

Dkt. No. 75, Ex. 3, Apr. 14, 2022 Mahon Decl. at ¶ 74.

Although Defendants' expert's ultimate conclusion is unpersuasive, this evidence confirms that "minimize" is a well-known concept in relevant arts. Any remaining question

about whether a particular accused instrumentality "minimize[s] changes" in the manner recited by these claims does not give rise to indefiniteness and instead is a question of fact regarding infringement. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) ("after the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on the accused product is for the finder of fact"); *see also Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007) ("[t]he resolution of some line-drawing problems . . . is properly left to the trier of fact") (citing *PPG*, 156 F.3d at 1355); *Eon Corp. IP Holdings LLC v. Silver Spring Networks, Inc.*, 815 F.3d 1314, 1318–19 (Fed. Cir. 2016) (citing *PPG*, 156 F.3d at 1355; citing *Acumed*, 483 F.3d at 806).

Finally, Defendants' expert discusses an excerpt from the prosecution history as purportedly setting forth an "explanation" of minimization. Dkt. No. 75, Ex. 3, Apr. 14, 2022 Mahon Decl. at ¶ 79. In that excerpt, however, the patentee did not define or explain "minimize changes." Instead, the patentee merely distinguished a prior art reference that minimized interference levels rather than minimizing changes in interference levels. See *id.* And in light of the foregoing, the opinion of Defendants' expert that "minimization requires finding the smallest possible value" is unpersuasive. *Id.* at ¶ 80.

At the August 18, 2022 hearing, Defendants emphasized this Court's decision in *CA, Inc. v. Netflix, Inc.*, No. 2:21-CV-80, 2021 WL 5323413 (E.D. Tex. Nov. 16, 2021). In that case, the Court found indefinite the term "minimizing." The term there at issue, however, was used in the context of a length of time. The Court found that "a person of ordinary skill in the art would have been unable to discern an objective standard for deciding, with reasonable certainty, whether 'a time required for retrieving' has been 'minimiz[ed].'" *Id.*, at *14. This is not

analogous to the disputed term in the present case, which relates to minimizing changes in interference levels.

The Court therefore hereby expressly rejects Defendants' proposed construction, and no further construction is necessary. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction."); *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012); *Summit 6, LLC v. Samsung Elecs. Co., Ltd.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015); *Bayer Healthcare LLC v. Baxalta Inc.*, 989 F.3d 964, 977–79 (Fed. Cir. 2021).

The Court accordingly hereby construes **"[determining/determine] revised operating parameters for the [first/second] UE that minimize changes to"** to have its **plain meaning**.

VI. DISPUTED TERMS IN U.S. PATENT NO. 7,233,620

The '620 Patent, titled "Bandwidth-Efficient Wireless Network Modem," issued on June 19, 2007, and bears an earliest priority date of April 18, 2001. Plaintiff submits that "the inventions determine the signal-to-noise ratio in a channel, and whether there is sufficient noise margin to add additional users to the channel," and "[t]he channels are dynamically allocated

accordingly, improving the efficiency of the wireless network." Dkt. No. 67 at 23. The Abstract of the '620 Patent states:

> Wireless communication network dynamically assigning communicators to allocated channels by considering the interference and noise environment to maximize the number of communicators and effective bandwidth of the channel. The present invention provides a digital wireless modem capable of measuring interference and noise in a channel, signaling the information on a control channel, accepting dynamic channel assignments from a controlling element and demodulating signals in the presence of interference and noise. The modem uses a demodulator capable of recovering information from data signals in the presence of noise and interference stronger than the primary signal, and there is a controlling element for transmitting noise and interference measurements to a central network controller and a controlling element for determining channel assignments with the central network controller and setting the modem to the correct transmission and reception channel.

9. "each of one or more interfering signals"

"each of one or more interfering signals" ('620 Patent, Claim 1)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meeting	"all interfering signals"

Dkt. No. 60, Ex. A at 1; *id.*, Ex. B at p. 2 of 11; Dkt. No. 78, Ex. A at 1.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction: "each of all of the interfering signals detected by the modem." Defendants agreed with the preliminary construction. Plaintiff opposed.

(a) The Parties' Positions

Plaintiff argues that "Defendants' construction contradicts the specification, changes the meaning of the term, and creates ambiguity." Dkt. No. 67 at 23. Plaintiff also argues that the prosecution history cited by Defendants "does not evidence a 'clear and unmistakable' intent to

disavow claim scope or otherwise change the plain meaning of 'each of one or more interfering signals.'" *Id.* at 25. (citations omitted).

Defendants respond: "The Court should adopt Defendants' proposed construction because it gives meaning to all words in the claim. Although Plaintiff purports to not construe the claim term, Plaintiff's interpretation under the plain and ordinary meaning reads the words 'each of' out of the claim, is inconsistent with all embodiments in the specification, and ignores a clear and unambiguous statement in prosecution that unlike the prior art, the patentee's invention 'reconstruct[s] all signals and all interfering signals.'" Dkt. No. 75 at 20. Defendants argue that "[t]he plain language that [*sic*] requires reconstructing an estimate of each interfering signal, which would require reconstruction of all interfering signals," and "[r]econstructing all interfering signals is fundamental to the purported invention as described in the specification." *Id.* "Moreover," Defendants argue, "the purported invention would be inoperative if only some, as opposed to every, interfering signal could be reconstructed." *Id.* at 21 (citation omitted). Finally, Defendants argue that "[t]he prosecution history further supports Defendants' proposed construction," and the patentee "clearly and unmistakably disclaimed [the] Liu[] [reference's] reconstruction of less than all interfering signals in favor of the claimed reconstruction of all interfering signals." *Id.* at 21–22.

Plaintiff replies that whereas the specification discloses that "the present invention applies to any number of interfering digital signals on the same channel" ('620 Patent at 3:58–61), "Defendants do not dispute that their construction would encompass 'all' interfering signals, including signals on disparate channels and signals from external sources not intended for the system." Dkt. No. 77 at 8 (citations omitted). Further, Plaintiff argues that "Defendants' 'inoperability' argument is wrong even if limited to interfering signals on a single channel"

because "[t]he specification suggests that if less than all such interfering signal [on a single channel] were reconstructed when calculating noise power—e.g., some interfering signals were effectively treated as 'noise' for the noise power calculation—the result would be decreased performance, not inoperation." *Id.* at 8–9 (citing '620 Patent at 10:42–47, 11:35–39 & 11:56–62). Finally, Plaintiff argues that "Defendants' disclaimer argument (Resp. 21-22) places too much weight on an isolated prosecution history statement, where: (1) the statement was not made in connection with an amendment adding 'each of one or more'; (2) the statement was made to clarify an embodiment; and (3) the Examiner did not rely on the statement to traverse prior art." *Id.* at 9.

At the August 18, 2022 hearing, Plaintiff argued that this disputed term appears as part of a recited "reconstruction" that is performed for only one particular channel (before potentially moving on to do the same for another channel).

(b) Analysis

As a threshold matter, Plaintiff argues that "all" in Defendants' proposal "could mean that one single estimate is generated for a combination of all interfering signals." This is not Defendants' proposal, as Defendants clarify in their responsive claim construction brief. *See* Dkt. No. 75 at 22 ("Collision's argument is a straw man. Defendants['] construction of 'all interfering signals' does not require 'the sum of' all signals.").

Claim 1 of the '620 Patent recites (emphasis added):

> 1. A bandwidth efficient modem in a multi-user environment for determining whether additional users can be added to a system, comprising:
>
> a front end unit for processing input received signals into a baseband waveform;
>
> a baseband waveform processor performing parameter estimation and demodulation of said baseband waveform, wherein said demodulation uses a processing scheme selected from at least one of the group consisting of: optimal maximum likelihood multi user detection (MUD), maximum likelihood MUD,

> maximum likelihood sequence estimation, successive interference cancellation, TurboMUD, iterative MUD, and linear algebra based MUD;
>
> a digital signal processor for reconstructing an estimate of *each of one or more interfering signals* and calculating a noise power, wherein said noise power is used by a network controller coupled to the bandwidth efficient modem to determine whether there is a sufficient noise margin to add said additional users, said network controller dynamically allocating channel assignments to the bandwidth efficient modem and wherein said reconstructing requires data from said parameter estimation and demodulation; and
>
> a waveform generator for processing channel communications, wherein said channel communications consist of message and signal information, communicated to said system.

The specification discloses:

> The method of the present invention applies to *any number of interfering digital signals on the same channel* provided that sufficient signal to noise margin exists to jointly demodulate all of the signals.
>
> * * *
>
> FIG. 4 shows how the bit processing computer 70 *estimates the power level of each interfering signal in the channel* and the residual random thermal noise power. Using the bit value estimates from the joint detector 80 and parameter estimates from the synchronizing element 82, the bit processing computer 70 reconstructs an estimate of each interfering signal. This processing requires knowing the power of every interfering element in the channel whether signals or noise because the scheduler of the controller terminal, such as in a satellite terminal or wireless LAN terminal, depend on the quality of service of each element experience. The bit processor 70 calculates the signal to noise ration [*sic*] (SNR) and carrier to interference ratio (CIR) for every communicating element in the channel.
>
> * * *
>
> While *interfering signals* can be removed due to their deterministic modulation structure, some elements of residual thermal noise, such as white Guassian noise, are random and unpredictable and cannot be estimated and removed from the channel. However, any noise elements that can be statistically estimated or determined, can be filtered and result in improved performance.

'620 Patent at 3:58–61, 10:36–49 & 11:56–62 (emphasis added); *see id.* at 5:17–21 ("a digital signal processor for reconstructing an estimate of each interfering signal").

Defendants propose interpreting "each of one or more interfering signals" as referring to "all" interfering signals—in other words, each and every interfering signal. At the August 18, 2022 hearing, Defendants argued that all detected signals must be included so as to be able to accurately calculate a signal-to-noise ratio.

Plaintiff's expert opines that "[t]he claim requires that 'each of one or more' interfering signals is estimated, which allows for scenarios where the estimation is performed for a subset of interfering signals within a larger group of interfering signals." Dkt. No. 67, Apr. 14, 2022 Feuerstein Decl. at ¶ 41.

On one hand, Defendants' inoperability argument is unpersuasive. Defendants submit the opinion of their expert that "[t]he purported invention would be inoperative if less than all interfering signals were reconstructed because its noise power calculation would erroneously include interference." *See* Dkt. No. 75, Ex. 3, Apr. 14, 2022 Mahon Decl. at ¶ 43. This opinion of Defendants' expert is unpersuasive because sub-optimal performance is not the same as inoperability.

Also, as Plaintiff asserts, and as Defendants do not dispute, as a general matter the phrase "one or more" is not limited to meaning "all."

On the other hand, during prosecution, the patentee distinguished the "Liu" reference as follows:

> Liu essentially uses the SINR to establish a noise floor without taking into account whether the noise floor is composed of signals or interferers, and then allocates channels above the noise floor. Liu describes channel allocation according to 'achievable rates', the description of this term refers to the use of SINR. (see Liu Col 8, lines 26–52). It is unclear if the 'achievable rates' can be processed in any other manner as the description does not provide any clear instruction.
>
> However, there is certainly no description of reconstructing all signals and *all interfering signals* as described in the present application. The present invention

> jointly demodulates intended transmission and *any interfering transmissions*, and signal reconstruction includes processing for carrier to interference (CIR) and channel signal to noise (SNR) . . . .

Dkt. No. 67, Ex. 7, Sept. 21, 2006 Office Action Response at 8–9 (emphasis added).

Plaintiff characterizes this as an "isolated statement" that was not made in connection with adding "each of one or more" to the claim (*see* Dkt. No. 77 at 9), and Plaintiff cites, for example, the proposition that "[e]ven if an isolated statement appears to disclaim subject matter, the prosecution history as a whole may demonstrate that the patentee committed no clear and unmistakable disclaimer." *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1342 (Fed. Cir. 2009). Plaintiff also cites the opinion of its expert that "a POSITA would have understood that the applicant was just addressing how the added language helped differentiate the invention from Liu, and was not intending to limit the 'each of one or more interfering signals' limitation." Dkt. No. 67, Apr. 14, 2022 Feuerstein Decl. at ¶ 43.

At the August 18, 2022 hearing, Plaintiff further argued that whereas the above-reproduced sentence that refers to "all interfering signals" refers to the "present application," the immediately following sentence refers to "[t]he present invention," which Plaintiff argued demonstrates that the statement regarding the "present application" does not limit the "invention." The sentence that refers to "[t]he present invention" also refers to "jointly demodulat[ing] intended transmission and *any* interfering transmissions," which tends to reinforce, rather than undercut, that the patentee referred to reconstructing all interfering signals.

On balance, the patentee's statements distinguishing Liu should be given effect in the Court's construction. *See, e.g., Southwall*, 54 F.3d at 1576. That is, even if Plaintiff is correct that "[t]he Examiner indisputably did not rely on inventor's statement to traverse the prior art" (Dkt. No. 67 at 25), a patentee "cannot escape the import of its statements to the Patent Office by

suggesting they were not needed to overcome the Examiner's rejection." *Data Engine Techs. LLC v. Google LLC*, 10 F.4th 1375, 1383 (Fed. Cir. 2021). Rather, "[c]onsistent with the public notice function of the prosecution history, the public is entitled to rely on these statements as defining the scope of the claims." *Id.* The *EcoLab* case cited by Plaintiff notes that statements in the prosecution history should be considered in the context of the prosecution history as a whole, *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1342 (Fed. Cir. 2009), but here Plaintiff does not persuasively identify anything to undercut the patentee's above-discussed reliance on reconstructing all interfering signals.

This understanding based on the prosecution history is consistent with the above-reproduced disclosures in the specification. *See* '620 Patent at 3:58–61, 10:36–49 & 11:56–62.

The meaning of "all," however, is a subject of dispute between the parties. Plaintiff argues that even if the disputed term is interpreted as referring to "all" interfering signals, this only means all interfering signals on the particular *channel* that is being used for communication. Plaintiff cites, for example, a statement in the specification that "[t]he method of the present invention applies to any number of interfering digital signals on the same channel provided that sufficient signal to noise margin exists to jointly demodulate all of the signals." '620 Patent at 3:58–61; *see id.* at 9:17–22 ("the baseband processor 58 calculates the power levels of every interfering signal on the channel"); *see also id.* at 9:11–14, 9:59–64 ("the interfering signals on the channel"), 10:8–13 & 10:36–47 ("This processing requires knowing the power of every interfering element in the channel whether signals or noise . . . ."); Dkt. No. 67 at 24.

These statements do not persuasively support Plaintiff's suggestion of limiting the disputed term so as to refer to a particular "channel." Such a limitation in the construction for this particular disputed term would be unclear, particularly in light of the recital elsewhere in the

claim of "dynamically allocating channel assignments." The opinion of Plaintiff's expert in this regard is unpersuasive. *See* Dkt. No. 67, Apr. 14, 2022 Feuerstein Decl. at ¶ 42 ("the inventors contemplated that the invention would be applied to the interfering signals that are intended for the system in a particular channel").

Nonetheless, the preamble provides context, reciting "[a] bandwidth efficient modem in a multi-user environment for determining whether additional users can be added to a system, comprising . . . ." Even if the preamble is not limiting, this preamble language provides context for understanding that the "interfering signals" are recited in the context of the "modem" and the "system" rather than in the context of a particular "channel." *See* Dkt. No. 67, Apr. 14, 2022 Feuerstein Decl. at ¶ 30 (discussing interference from various sources, including "out-of-network from other network providers" as well as "external sources such as from noisy equipment (e.g. arc welding devices or electrical motors), military radars, communications or jamming equipment, and microwave links"); *cf. Bio-Rad Labs., Inc. v. 10X Genomics, Inc.*, 322 F. Supp. 3d 537, 545 (D. Del. 2018) (Andrews, J.) ("While I declined to construe the word 'each' in my *Markman* opinion, I stated, 'I think it is apparent from the claim language that the phrase "each plug-fluid" is not meant to include every plug-fluid in the Universe without expressly including such a limitation in the construction of this term.' I found no construction was necessary for the word 'each,' 'with the understanding that "each" refers only to the plugs and plug-fluids in the claim at issue and not plugs and plug-fluids generally.'") (citation omitted).

The construction should therefore refer to "the" one or more interfering signals, such that the claim requires reconstructing only one interfering signal when only one is present, but if the claimed modem detects more than one interfering signal then the claim requires reconstructing each such signal.

The Court therefore hereby construes **"each of one or more interfering signals"** to mean **"each of the one or more interfering signals."**

VII. DISPUTED TERMS IN U.S. PATENT NO. 7,593,492

The '492 Patent, titled "Combinational Hybrid Turbo-MUD," issued on September 22, 2009, and bears a filing date of September 15, 2006. Plaintiff submits that "[t]he '492 patent is generally directed to addressing problems associated with multi-user detection within a multi-user wireless network," and "[t]he inventions of the '492 patent address these problems by using a decision unit to select, for a given situation based on a set of decision criteria, either slower but higher complexity MUDs or faster, low-complexity MUDs." Dkt. No. 67 at 25. The Abstract of the '492 Patent states:

> A high quality real-time Turbo-Mud processing system that chooses between a high complexity multi-user detectors [*sic*] that results in better estimates of the bit streams and computationally low linear-based-MUD/Turbo-MUD at each MUD window in each Turbo Iteration. In one embodiment this technique optimizes both the BER and the computational complexity of the receiver by using low complexity MUDs to reduce the number of symbols that the high complexity MUDs need to process. The present invention also provides an efficient means of estimating symbols transmitted in a multi-user environment in overloaded or super-saturated conditions.

10. "multi-user detector decision unit using decision criteria to determine a selected multi-user detector"

"multi-user detector decision unit using decision criteria to determine a selected multi-user detector" '492 Patent, Claim 1	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Plain and ordinary meaning If this term is subject to § 112(6): Function: "using decision criteria to determine a selected multi-user detector" Structure: "decision logic components with any of the algorithms described at 8:12–18, 13:35–14:40, 15:3–15:21, 19:43–48, 19:56–62, 20:41–49"	Means-plus-function Function: "using decision criteria to determine a selected multi-user detector" Structure: "processor with any of the algorithms described at 8:12–18, 13:35–14:40, 15:3–15:21, 19:43–48, 19:56–62, 20:41–49"[2]

Dkt. No. 60, Ex. A at 1–2; Dkt. No. 78, Ex. A at 4.

Shortly before the start of the August 18, 2022 hearing, the Court provided the parties with the following preliminary construction: "Means-plus-function term governed by 35 U.S.C. § 112, ¶ 6 / Function: 'using decision criteria to determine a selected multi-user detector' / Structure: 'MUD decision unit 220 (or decision logic unit 520) configured to perform one or more of the algorithms described at 8:12–18, 13:35–14:40, 15:3–15:21, 19:43–48, 19:56–62 & 20:41–49; and equivalents thereof.'"

(a) The Parties' Positions

Plaintiff argues that Defendants cannot rebut the presumption against means-plus-function treatment for these non-means terms. Dkt. No. 67 at 26. Plaintiff also argues that this is

[2] Defendants previously proposed: "processor with algorithms as described in 13:35–44, 13:55–57, 13:63–65, 14:7–9, 14:19–23, 14:32–40." Dkt. No. 60, Ex. B at p. 2 of 11.

confirmed by structural connections recited in the claims as well as by "detailed description of the 'multi-user detector decision unit' and its operation" in the specification. *Id.* at 26–28 (citations omitted). Alternatively, Plaintiff argues that "[t]he corresponding structure is 'decision logic components,' and is not limited to a generic processor," and "[l]imiting the physical structure to a generic 'processor' fails to account for the specification's disclosure that 'decision logic unit 520' (or 'MUD decision unit 220') performs the function of selecting the MUD based on decision criteria." *Id.* at 28 (citation omitted).

Defendants respond that "Collision argues that the 'multi-user detector decision unit' itself is the structure but a POSITA would not understand this to be any particular structure because it is not a term of art." Dkt. No. 75 at 24 (citation omitted). Instead, Defendants argue, "[t]he term was coined by the patentee to describe what the patentee regarded as the point of novelty." *Id.* Defendants therefore argue that the term is a means-plus-function term and is limited to the structures identified in the '492 Patent. *Id.* at 24–25. As for the corresponding structure, Defendants argue: "'decision logic' itself is not a structure but could be implemented by a structure, such as computer circuitry. Accordingly, Collision has not proposed a corresponding structure." *Id.* at 26.

Plaintiff replies that even if this is found to be a "coined" term, as Defendants argue, "coined terms can connote structure such that § 112(6) does not apply." Dkt. No. 77 at 9 (citation omitted). Plaintiff also argues that "the specification is replete with details of the inputs to the decision unit and its operation, all of which connotes structure to a POSITA." *Id.* at 10. Alternatively, Plaintiff argues that "Defendants rely on an inapposite case concerning the term 'logic,' but the proposal here is 'decision logic,' which is a structure," and "Defendants do not

address their failure to list all algorithms from the specification that perform the claimed function.

(b) Analysis

Legal principles regarding 35 U.S.C. § 112, ¶ 6 are set forth above regarding the "means for stacking . . ." and "a stacking device . . ." terms.

Claim 1 of the '492 Patent, for example, recites (emphasis added):

> 1. A hybrid Multi-User Detector System for processing received signals, comprising:
>
> a parameter estimator coupled to said received signals providing received data information;
>
> a *multi-user detector decision unit* coupled to said parameter estimator and said received signals;
>
> at least two multi-user detectors coupled to said parameter estimator and said *multi-user detector decision unit*, said *multi-user detector decision unit using decision criteria to determine a selected multi-user detector*, wherein said selected multi-user detector outputs a plurality of information streams, one stream corresponding to each of said received signals; and
>
> a bank of decoders coupled to said plurality of information streams, wherein said decoders output a plurality of improved information streams.

The specification discloses, for example:

> Inside the turbo loop, a decision is made by the MUD decision unit 220 as to which MUD decoder to use based on certain criteria. The criteria can include such aspects as computational complexity, the number of bits to detect, expected BER of each detector for all users, and correlation structure. There can be a plurality of MUD units available for selection. The MUD decision unit 220 in this example decides between lower complexity linear mud 235, a medium complexity MUD 230 and a high complexity MUD 225.
>
> * * *
>
> Based upon the decision logic, the MUD is chosen 320 for the particular window of data. As described herein, there are multiple MUD algorithms to choose from and the optimal MUD is selected based upon certain metrics.
>
> * * *
>
> The decision logic unit 520 selects which MUD to use based on certain metrics as detailed herein. By way of example there are three MUDs depicted which

> includes a high complexity M-Algorithm algorithm 525, a linear MUD 530, and a low complexity "MUD" being a matched filter 535.

'492 Patent at 14:33–41, 18:1–2 & 19:24–29; *see also id.* at 14:56–15:21, 19:30–55 & 20:29–35; *see also id.* at 8:7–11 ("said plurality of refined information streams are fed back to said multi-user detector decision unit for iterative processing"), 13:2–3 ("The raw data input 205 is fed to the parameter estimator 210 and also to a MUD decision unit 220.") & 13:33–47 ("examples of possible decision metrics").

On one hand, the "multi-user detector decision unit" is *not* recited "in a format consistent with traditional means-plus-function claim limitations." *Williamson*, 792 F.3d at 1350. Also, the claim recites a connection between the multi-user detector decision unit and other components, namely the parameter estimator and the bank of decoders. *Williamson* suggests that inputs, outputs, and interactions with other components can be considered. *See id. at* 1351 ("While portions of the claim do describe certain *inputs and outputs* at a very high level (e.g., communications between the presenter and audience member computer systems), the claim does not describe how the 'distributed learning control module' *interacts with other components* in the distributed learning control server in a way that might *inform the structural character of the limitation-in-question or otherwise impart structure* to the 'distributed learning control module' as recited in the claim.") (emphasis added). Plaintiff also cites *Apple v. Motorola* in this regard. *See Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1301 (Fed. Cir. 2014) ("the claim language and specification disclose the heuristics' operation within the context of the invention, including the inputs, outputs, and how certain outputs are achieved"). Even if these terms refer to software components rather than distinct hardware components, software components can potentially be structural for purposes of analyzing whether 35 U.S.C. § 112, ¶ 6 applies. Further, in some cases, use of a computer can be implicit. *Cf. In re Dossel*, 115 F.3d 942, 946–947 (Fed. Cir.

1997) ("Clearly, a unit which receives digital data, performs complex mathematical computations and outputs the results to a display must be implemented by or on a general or special purpose computer (although it is not clear why the written description does not simply state 'computer' or some equivalent phrase).").

On the other hand, the word "unit" as used in the term here at issue is a nonce word that can be "tantamount to using the word means." *Williamson*, 792 F.3d at 1350; see Manual of Patent Examining Procedure § 2181 (9th ed., rev. 10.2019). The issue, then, is whether the phrase "multi-user detector decision" imparts structural meaning to the word "unit."

On balance, "while [Plaintiff] is correct that the presence of modifiers can change the meaning of '[unit],' the presence of these particular terms does not provide any structural significance to the term '[unit]' in this case." *Id.* at 1351. Moreover, the specification, such as cited above, does *not* demonstrate that a person of ordinary skill in the art would understand this disputed term as referring to any particular class of structures in the relevant art.

The authorities cited by Plaintiff are unpersuasive. *See Rembrandt Techs., L.P. v. Comcast Corp.*, 512 F. Supp. 2d 749, 759 (E.D. Tex. 2007) ("[a] limitation [that] does not recite any function . . . is outside the scope of § 112 ¶ 6"); *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1359–60 (Fed. Cir. 2011) ("modernizing device" not § 112(6) because the claims "delineate the components that the modernizing device is connected to, describe how the modernizing device interacts with those components, and describe the processing that the modernizing device performs"). In addition to being not sufficiently analogous, these authorities do not pre-date the *Lighting World* decision. *See Williamson*, 792 F.3d at 1349 ("[h]enceforth, we will apply the presumption as we have done prior to *Lighting World*") (citing *Lighting World*, 382 F.3d at 1358). *Rembrandt* and *Inventio* were thus decided

under the "strong" presumption that *Williamson* abrogated. *See Williamson*, 792 F.3d at 1349; *see, e.g., Inventio*, 649 F.3d at 1356 ("the presumption flowing from the absence of the term 'means' is a strong one that is not readily overcome") (citing *Lighting World*, 382 F.3d at 1358).

The *Blue Spike* decision cited by Plaintiff does not compel otherwise. *Blue Spike, LLC v. Tex. Instruments, Inc.*, No. 6:12-CV-499-MHS-CMC, 2014 WL 5299320, at *20 (E.D. Tex. Oct. 16, 2014) ("comparing device"). To whatever extent this decision is analogous, this *Blue Spike* decision was entered prior to *Williamson*, and although the objections to the decision of the magistrate judge were decided a few days after *Williamson*, it appears that the "comparing device" terms were not subject to any objection. Plaintiff's reliance on *Blue Spike* is therefore unavailing.

The *Apex* case cited by Plaintiff is also unpersuasive because the word "unit" is not akin to the term "circuit" that was at issue in *Apex*. *See Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 373 (Fed. Cir. 2003) (discussing "circuit" recited with modifiers such as "interface," "programming," and "logic").

Plaintiff also cites a finding that a "control unit configured to . . ." term was not a means-plus-function term in the *Cellular Communications Equipment* case. *See Cellular Commc'ns Equip. LLC v. HTC Corp.*, No. 6:16-CV-475-KNM, 2018 WL 316472, at *13–*15 (E.D. Tex. Jan. 8, 2018). In that case, however, the patentee submitted evidence that the phrase "control unit" referred to a known class of structures in the art of computer processors. *Id.* at *15. Likewise, in the *Optis Wireless* case cited by Plaintiff, the Court found that "[i]n the context of a mobile-communication-system patent and a claim to a 'mobile station apparatus,' the 'determination unit' is a specially configured electronic circuit," and the specification in that case

referred to particular types of circuits. *See Optis Wireless Tech. LLC v. ZTE Corp.*, No. 2:15-CV-300-JRG-RSP, 2016 WL 1599478, at *26 (E.D. Tex. Apr. 20, 2016).

In the present case, by contrast, neither the surrounding claim language nor the specification provides any context to imply that "multi-user detector decision" adds any structural meaning to the word unit. The recital of "said multi-user detector decision unit using decision criteria to determine a selected multi-user detector" likewise does not connote any particular structure for performing this recited function. This distinguishes the present case from the above cases as well as the *E2E* case cited by Plaintiff, in which the claim used several "component" terms in the context of servers, application programs, and extensible markup language documents. *See E2E Processing, Inc. v. Cabela's Inc.*, No. 2:14-CV-36-JRG-RSP, 2015 WL 4051423, at *3–*8 (E.D. Tex. July 2, 2015). At the August 18, 2022 hearing, Plaintiff emphasized the recital of "a multi-user detector decision unit *coupled* to said parameter estimator and said received signals." On balance, this limitation does not impart sufficient structural connotations to the "unit" term here at issue so as to avoid application of 35 U.S.C. § 112, ¶ 6.

The opinions of Plaintiff's expert are also unpersuasive. *See* Dkt. No. 67, Apr. 14, 2022 Feuerstein Decl. at ¶¶ 45–53. Even accepting the opinions of Plaintiff's expert that "decision logic" has been a well-known class of structures in the relevant art (*see id.* at ¶ 47), the disputed term does not recite "decision logic." Plaintiff does not demonstrate that the term "multi-user detector decision unit" has been a known structural term in the relevant art. *See, e.g. Diebold*, 899 F.3d at 1302 ("there is no evidence—in the form of dictionary definitions or otherwise—that 'cheque standby unit' was reasonably well understood by persons of ordinary skill in the art to refer to a structure or class of structures") (citation omitted). Plaintiff argues that "[t]he structure here is a permissible class of hardware devices that decides what multiuser detector to use,"

citing Plaintiff's expert. Dkt. No. 77 at 10 (internal quotation marks omitted); *see* Dkt. No. 67, Apr. 14, 2022 Feuerstein Decl. at ¶ 45 ("In the context of the claims and the specification, which involves computer circuitry, a POSITA would have clearly understood that 'multi-user detector decision unit' is decision logic that decides between multiple multi-user detectors (MUDs)."); *see also id.* at ¶ 46. This argument itself describes the term in a functional manner, and Plaintiff's expert does not persuasively support his opinion that this "unit" term connotes sufficient structure. *See id.* at ¶¶ 45–46.

Also, Plaintiff's expert opines: "Decision logic is a common structure in many types of systems, commonly implemented in processors (including, for example, microprocessors (MPUs), microcontrollers (MCUs), and Digital Signal Processors (DSPs)), Complex Programmable Logic Devices (CPLDs), Field Programmable Gate Arrays (FPGAs), baseband ICs, or any discrete logic components." *Id.* at ¶ 55 (citing '492 Patent at 19:24–25 & 20:26–30). This opinion of Plaintiff's expert, however, pertains to "logic," which is not recited in the claim here at issue.

Finally, it is noteworthy that the claims do not recite the "multi-user detector decision unit" as part of a software structure. The claim here at issue, Claim 1 of the '492 Patent, recites: "A hybrid Multi-User Detector System for processing received signals, comprising: a parameter estimator coupled to said received signals providing received data information; a multi-user detector decision unit coupled to said parameter estimator and said received signals; . . . ." This "unit" term is thus directed not to any particular class of structures but rather to anything that performs the claimed function.

The Court therefore finds that the presumption against means-plus-function has been rebutted, and thus the term "multi-user detector decision unit using decision criteria to determine

a selected multi-user detector" is a means-plus-function term governed by 35 U.S.C. § 112, ¶ 6. *See, e.g., Dyfan*, 28 F.4th at 1367 ("[The challenger] had to show, by a preponderance of the evidence, that persons of ordinary skill in the art would not have understood the . . . limitations to connote structure in light of the claim as a whole.").

As for the proper corresponding structure, Plaintiff proposes referring to "decision logic components," but the specification links the claimed function to "MUD decision unit 220" and "decision logic unit 520" as alternative corresponding structures. *See, e.g.,* '492 Patent at 13:33–35 ("the MUD decision unit 220 that selects from among at least one MUD 225, 230, 235 represents one of the inventive aspects of the present invention") & 19:24–25 ("The decision logic unit 520 selects which MUD to use based on certain metrics as detailed herein."); *see also Creo Prods., Inc. v. Presstek, Inc.*, 305 F.3d 1337, 1346 (Fed. Cir. 2002) ("[D]isclosed structure includes that which is described in a patent specification, including any alternative structures identified."); *Ishida Co., Ltd. v. Taylor*, 221 F.3d 1310, 1316 (Fed. Cir. 2000); *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999) ("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.").

The specification provides additional details regarding the "MUD decision unit 220" and "decision logic unit 520," and the corresponding structures proposed by the parties identify the same portions of the specification, namely "any of the algorithms described at 8:12–18, 13:35–14:40, 15:3–15:21, 19:43–48, 19:56–62, 20:41–49." Dkt. No. 78, Ex. A at 4.

The Court therefore hereby finds that **"multi-user detector decision unit using decision criteria to determine a selected multi-user detector"** is a means-plus-function term, the claimed function is **"using decision criteria to determine a selected multi-user detector,"** and

the corresponding structure is **"MUD decision unit 220 (or decision logic unit 520) configured to perform one or more of the algorithms described at 8:12–18, 13:35–14:40, 15:3–21, 19:43–48, 19:56–62, and 20:41–49; and equivalents thereof."**

11. "said design criteria"

"said design criteria" '492 Patent, Claim 3	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"said decision criteria"	Indefinite

Dkt. No. 60, Ex. A at 2; *id.*, Ex. B at p. 2 of 11.

Plaintiff argues that this claim contains a correctable typographical error because "the presence of 'decision criteria' in claim 1 provides the antecedence for 'said design criteria,' and renders the scope of claim 3 readily and reasonably ascertainable to a POSITA." Dkt. No. 67 at 30.

Defendants' response brief does not address this term. *See* Dkt. No. 75.

Plaintiff's reply brief likewise does not address this term. See Dkt. No. 77.

In their June 23, 2022 Joint Claim Construction Chart, the parties set forth their agreement that "said design criteria" should be construed to mean "said decision criteria." Dkt. No. 78, Ex. A at 5.

The Court therefore hereby construes **"said design criteria"** to mean **"said decision criteria."**

VIII. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patent-in-suit.

The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 31st day of August, 2022.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE