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

REMBRANDT WIRELESS TECHNOLOGIES, LP,	§	
	§	
v.	§	CASE NO. 2:13-CV-213-JRG-RSP
	§	
SAMSUNG ELECTRONICS CO., LTD., et al.	§	

CLAIM CONSTRUCTION
MEMORANDUM AND ORDER

On May 30, 2014, the Court held a hearing to determine the proper construction of the disputed claim terms in United States Patents No. 8,023,580 and 8,457,228. After considering the arguments made by the parties at the hearing and in the parties' claim construction briefing (Dkt. Nos. 97, 102, and 103),[1] the Court issues this Claim Construction Memorandum and Order.

[1] Citations to documents (such as the parties' briefs and exhibits) in this Claim Construction Memorandum and Order refer to the page numbers of the original documents rather than the page numbers assigned by the Court's electronic docket unless otherwise indicated. Defendants are Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., Samsung Telecommunications America, LLC, Samsung Austin Semiconductor, LLC (collectively referred to as "Samsung"), Blackberry Corp., and Blackberry Ltd. (collectively referred to as "Blackberry"; formerly known as Research In Motion Corp. and Research In Motion Ltd., respectively) (all collectively referred to as "Defendants").

Table of Contents

BACKGROUND

Plaintiff brings suit alleging infringement of United States Patents No. 8,023,580 ("the '580 Patent") and 8,457,228 ("the '228 Patent") (collectively, the "patents-in-suit").

The patents-in-suit are both titled "System and Method of Communication Using At Least Two Modulation Methods." The '580 Patent issued on September 20, 2011, and bears a filing date of August 19, 2009. The '228 Patent issued on June 4, 2013, and bears a filing date of August 4, 2011. The '228 Patent is a continuation of the '580 Patent. Both patents-in-suit bear an earliest priority date of December 5, 1997.

In general, the patents-in-suit relate to modulation methods for communications. Plaintiff argues that the patents-in-suit relate to the well-known "Bluetooth" wireless communication standards. *See* Dkt. No. 97 at 1. The Abstract of the '580 Patent is representative and states:

> A device may be capable of communicating using at least two type types [*sic*] of modulation methods. The device may include a transceiver capable of acting as a master according to a master/slave relationship in which communication from a slave to a master occurs in response to communication from the master to the slave. The master transceiver may send transmissions discrete transmissions [*sic*] structured with a first portion and a payload portion. Information in the first portion may be modulated according to a first modulation method and indicate an impending change to a second modulation method, which is used for transmitting the payload portion. The discrete transmissions may be addressed for an intended destination of the payload portion.

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 v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See id.* 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 v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[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 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.*

CONSTRUCTION OF DISPUTED TERMS

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with preliminary constructions of the disputed terms with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are set forth within the discussion of each term, below.

A. "first modulation method" and "second modulation [method]"

"first modulation method"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a first method for varying one or more characteristics of a carrier in accordance with information to be communicated"[2]	"a method of encoding data that is understood by a first type of receiver, but not by a second type of receiver"
"second modulation [method]"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a second method for varying one or more characteristics of a carrier in accordance with information to be communicated"[3]	"a method of encoding data that is understood by the second type of receiver, but not by the first type of receiver"

Dkt. No. 97 at 6; Dkt. No. 102 at 2-3. The parties submit that the first of these terms appears in Claims 1, 2, 13, 19, 21, 22, 23, 32, 40, 41, 49, 54, 58, 59, 70, 76, 78, and 79 of the '580 Patent and Claims 1, 5, 15, 17, 18, 22, 25, 26, 37, 38, 39, 41, 47, 48, 49, and 52 of the '228 Patent. Dkt.

[2] Plaintiff previously proposed: "No construction necessary; plain and ordinary meaning applies. Alternatively, 'a first method for encoding data onto a carrier.'" Dkt. No. 81, Ex. A at 7.

[3] Plaintiff previously proposed: "No construction necessary; plain and ordinary meaning applies. Alternatively, 'a second method for encoding data onto a carrier.'" Dkt. No. 81, Ex. A at 9.

No. 82, Ex. A at 7. The parties submit that the second of these terms appears in Claims 1, 13, 20, 22, 23, 32, 40, 49, 54, 58, 70, 77, and 79 of the '580 Patent and Claims 1, 10, 17, 18, 22, 23, 26, 37, 38, 41, 43, 47, and 49 of the '228 Patent. *Id.* at 9.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "first modulation method" means "a first method for varying one or more characteristics of a carrier signal in accordance with information to be communicated"; and "second modulation [method]" means "a second method for varying one or more characteristics of a carrier signal in accordance with information to be communicated." Plaintiff had no opposition to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "Defendants' constructions . . . confuse 'modulation' with 'encoding'" and import limitations from a preferred embodiment. Dkt. No. 97 at 6. Plaintiff also submits that examples of the characteristics of a carrier than can be modulated are amplitude, frequency, and phase. *Id.* In this regard, Plaintiff cites extrinsic dictionary definitions (quoted below) as well as statements by Defendant Samsung in an inter partes review ("IPR") filing. *Id.* at 7; *see id.*, Ex. 7, 3/20/2014 Petition for *Inter Partes* Review of U.S. Patent No. 8,023,580 at 9 (citing *The IEEE Standard Dictionary of Electrical and Electronics Terms* 662 (6th ed. 1996)). Plaintiff also argues that the constituent terms "first" and "second" refer to repeated instances rather than to any distinction or incompatibility. *Id.* at 8. Plaintiff explains that this is a patent law convention and that this interpretation is consistent with usage of "first" and "second" in various claims as well as in the Summary section of the '580 Patent. *Id.* at 8-10.

As to Defendants' proposed constructions, Plaintiff argues that the patents-in-suit "never use the term 'encode' at all," and Plaintiff cites the provisional patent application to which the patents-in-suit claim priority as distinguishing between "modulation" and "encoding." *Id.* at 11-12. Plaintiff also argues that Defendants' proposal of incompatibility between the first and second modulation methods is found in a preferred embodiment but not in the claims. *Id.* at 12. Plaintiff submits that such a limitation appears only in dependent claims, namely Claims 18 and 75 of the '580 Patent. *Id.* at 13. Further, Plaintiff argues, Defendants' proposals would improperly exclude embodiments in which "modems may be capable of using several different modulation methods." *Id.* (quoting '580 Patent at 1:36-37; citing *id.* at 5:51-54). Plaintiff likewise argues that "the USPTO examiner recognized that the claimed 'first' and 'second' modulation methods could be understood by a common receiver—contrary to Defendants' constructions." Dkt. No. 97 at 14. Finally, Plaintiff urges that Defendants' proposals "would render claim limitations that explicitly require 'the first modulation method is different than the second modulation method' superfluous." *Id.* at 16 (citing '580 Patent at Claims 23, 32 & 40).

Defendants respond that "the sole disclosed embodiment of the invention has a 'Trib 1'[4] modem that understands 'type A' modulation but not '[t]ype B,' and a 'Trib 2' modem that understands 'type B' modulation but not 'type A.'" Dkt. No. 102 at 3; *see id.* at 6-9. Defendants note that the specification asserts (in Defendants' words) that "in the prior art, because all modems connected to a common circuit needed to use compatible modulation methods, tribs that supported only a low-performance modulation method (e.g. type B) would not work in systems

[4] The patents-in-suit disclose that in a "multipoint architecture," the term "trib" is a shortened form of the word "tributary" and refers to one of several modems that communicates with a single "master" modem. *See* '580 Patent at 1:56-58 & 3:40-44. The term "trib" appears to be synonymous with the term "slave" as used in the patents-in-suit. *See* Dkt. No. 97, Ex. 7, 3/20/2014 Petition for *Inter Partes* Review of U.S. Patent No. 8,023,580 at 11.

that require a high-performance modulation (e.g. type A) for any tasks." *Id.* at 4. Defendants explain that "[i]f the tribs speak each other's language, the alleged invention would be unnecessary." *Id.* at 3; *see id.* at 5 ("If the type B trib could understand type A modulation, type A modulation would simply be used by both devices, as in the prior art.").

As to the prosecution history, Defendants highlight that the patentee deleted from the specification all disclosures of what Defendants refer to as a "bilingual" trib, *i.e.*, a trib with the ability to use two types of modulation. *Id.* at 9-10. Defendants also submit that the examiner statement cited by Plaintiff in its opening brief was made before the patentee deleted the disclosures of a bilingual trib. *Id.* at 10. Further, Defendants cite the prosecution history of ancestor United States Patent No. 6,616,838, during which the patentee stated: "The present invention is directed to the use of differing transceivers responsive to different modulation methods to the exclusion of other modulation methods . . . ." *Id.* at 11 (quoting Ex. 8, 9/27/2001 First Amendment and Response at p. 6 of 10).

As to their proposed constructions, Defendants note that "encoding" appeared in the constructions that Plaintiff had proposed prior to filing its opening claim construction brief. Dkt. No. 102 at 3 & 14. Defendants also argue: "First, contrary to [Plaintiff's] arguments, 'modulation' is 'encoding,' as [Plaintiff's] own dictionary confirms. Second, [Plaintiff's] construction injects the complex concept of carrier waves into the definition. That concept would not assist a jury." *Id.* at 14 (citations omitted). Finally, Defendants argue that the claim limitations requiring "different" modulation methods are "already superfluous." *Id.* at 15.

Plaintiff replies to Defendants' arguments as follows: (1) whether the claims adequately distinguish prior art is a matter of validity, not claim construction, and the patentee did not anywhere state that the point of novelty was that receivers understand only one modulation

method; (2) the claims should not be limited to a particular embodiment and, moreover, the patents-in-suit incorporate related patent applications that disclose bilingual tribs (*see* Dkt. No. 103, Ex. 30 at RIP9770); (3) the patentee removed, from the specification, references to measuring transmission line characteristics, but the patentee did not disclaim all embodiments in which multiple modulation methods could be understood by a single trib; (4) Defendants' technology tutorial submitted to this Court (Dkt. No. 103, Ex. 28) confirms that "modulation" is different than "encoding"; (5) the doctrine of claim differentiation is not overcome by any disclosures in the specification; and (6) Defendants' proposals would render superfluous the claim limitations requiring that the "first" and "second" modulation methods be "different." Dkt. No. 103 at 2-5.

At the May 30, 2014 hearing, Defendants emphasized that the only disclosed embodiment uses monolingual tribs and that during prosecution the patentee deleted disclosure of bilingual tribs. The Court inquired where, if anywhere, the patentee stated that a trib can understand only one modulation method. Defendants responded that the patentee made that statement "by implication" by removing the disclosure of bilingual tribs. In this regard, Defendants cited the case of *Abbott Laboratories v. Sandoz, Inc.*, 566 F.3d 1282 (Fed. Cir. 2009). As to Plaintiff's claim differentiation arguments, Defendants urged that the dependent claim "tail" cannot wag the specification "dog." *See N. Am. Vaccine, Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 1577 (Fed. Cir. 1993) ("The dependent claim tail cannot wag the independent claim dog.").

Plaintiff responded that the deletions were merely "housekeeping" and related primarily to test signals and to measuring transmission line characteristic rather than to the use of multilingual tribs. Plaintiff also reiterated that the patents-in-suit incorporate-by-reference

related applications that disclose multilingual tribs. Finally, Plaintiff cited *01 Communique Laboratory, Inc. v. LogMeIn, Inc.*, 687 F.3d 1292 (Fed. Cir. 2012), for the proposition that if the prosecution history is subject to a reasonable, non-limiting interpretation, then there is no disclaimer.

(2) Analysis

Claim 1 of the '580 Patent is representative and recites (emphasis added):

> 1. A communication device capable of communicating according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:
>
> a transceiver, in the role of the master according to the master/slave relationship, for sending at least transmissions modulated using at least two types of modulation methods, wherein the at least two types of modulation methods comprise *a first modulation method and a second modulation method, wherein the second modulation method is of a different type than the first modulation method*, wherein each transmission comprises a group of transmission sequences, wherein each group of transmission sequences is structured with at least a first portion and a payload portion wherein first information in the first portion indicates at least which of the *first modulation method* and the *second modulation method* is used for modulating second information in the payload portion, wherein at least one group of transmission sequences is addressed for an intended destination of the payload portion, and wherein for the at least one group of transmission sequences:
>
> the first information for said at least one group of transmission sequences comprises a first sequence, in the first portion and modulated according to the *first modulation method*, wherein the first sequence indicates an impending change from the *first modulation method* to the *second modulation method*, and
>
> the second information for said at least one group of transmission sequences comprises a second sequence that is modulated according to the *second modulation method*, wherein the second sequence is transmitted after the first sequence.

As an initial matter, Defendants' proposed constructions appear to render redundant the recital of "wherein the second modulation method is of a different type than the first modulation method." Defendants have countered that "[t]he limitations of these claims requiring 'different' modulation methods are . . . already superfluous" because "[Plaintiff] admits that the terms 'first' and 'second' . . . are used to distinguish two items that (while similarly named) are, in fact,

different." Dkt. No. 102 at 15. Nonetheless, such redundancy is disfavored when construing claims. *See Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so."); *see also Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991) (noting that "[a]ll the limitations of a claim must be considered meaningful").

As for the specification, the Background section of the '580 Patent states that prior art systems required all modems to use a single, common modulation method:

> In existing data communications systems, a transmitter and receiver modem pair can successfully communicate only when the modems are compatible at the physical layer. That is, the modems must use *compatible modulation methods*. This requirement is generally true regardless of the network topology. For example, point-to-point, dial-up modems operate in either the industry standard V.34 mode or the industry standard V.22 mode. Similarly, in a multipoint architecture, all modems operate, for example, in the industry standard V.27bis mode. While the modems may be capable of using several different modulation methods, *a single common modulation is negotiated at the beginning of a data session to be used throughout the duration of the session*.

'580 Patent at 1:26-39 (emphasis added). The specification then discloses using different modulation methods:

> For example, some applications (e.g., internet access) require *high performance modulation*, such as quadrature amplitude modulation (QAM), carrier amplitude and phase (CAP) modulation, or discrete multitone (DMT) modulation, while other applications (e.g., power monitoring and control) require only modest data rates and therefore a *low performance modulation* method.
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> * * *
>
> While it is possible to use high performance tribs running state of the art modulation methods such as QAM, CAP, or DMT to implement both the high and low data rate applications, *significant cost savings can be achieved if lower cost tribs using low performance modulation methods are used to implement the lower data rate applications*.

Id. at 2:1-8 & 5:17-22 (emphasis added).

> A block diagram of a master transceiver 64 in communication with a trib 66 in accordance with the principles of the present invention is shown in FIG. 3. * * *
>
> Trib 66 comprises CPU 82 in communication with modulator 84, demodulator 86, and memory 88. Memory 88, likewise holds software control program 92 and any data necessary for the operation of trib 66. Control programs 78 and 92, are executed by CPUs 68 and 82 and provide the control logic for the processes to be discussed herein. Control program 92 includes logic for *implementing a particular modulation method*, which, for purposes of illustration, is called type X[.] Inasmuch as master transceiver 64 is capable of running *either* a type A *or* a type B modulation method, type X refers to *one* of those two modulation methods.

Id. at 5:23-25 & 5:42-44 (emphasis added).

> [A]s shown in FIG. 5, master transceiver 64 establishes type A as the primary modulation in sequence 104. Note that because trib 66*b* responds only to type B modulation transmissions, only the type A tribs 66*a*-66*a* are receptive to transmission sequence 104.
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> * * *
>
> Note that the trailing sequence 114 is ineffective in establishing the termination of a communication session between master transceiver 64 and a type B trib 66*b* because the trailing sequence is transmitted using type A modulation.

Id. at 5:65-6:2 & 6:25-29.

The specification does not, however, warrant Defendants' proposed finding that the invention is framed exclusively in the realm of monolingual tribs. Instead, the specification discloses that the advantage of using multiple modulation methods is applicable to multi-lingual tribs:

> The present invention has many advantages, a few of which are delineated hereafter as merely examples.
>
> One advantage of the present invention is that it provides to the *use of a plurality of modem modulation methods on the same communication medium*.
>
> Another advantage of the present invention is that a master transceiver can communicate seamlessly with tributary transceivers or modems using incompatible modulation methods.

‘580 Patent at 2:50-57 (emphasis added).

As to the prosecution history, Defendants have focused on: (1) a statement regarding the “present invention” during prosecution of an ancestor patent; and (2) the patentee’s deletion of certain paragraphs from the specification of the patents-in-suit.

First, Defendants have cited the prosecution history of ancestor United States Patent No. 6,616,838, during which the patentee stated: “The present invention is directed to the use of differing transceivers responsive to different modulation methods to the exclusion of other modulation methods . . . .” Dkt. No. 97, Ex. 17, 9/27/2001 First Amendment and Response at 6. Yet, the ‘580 Patent is a continuation of a continuation of a continuation-in-part of the ‘838 Patent. The multiple intervening applications render the cited prosecution statement too attenuated to be deemed definitive as to the patents-in-suit, particularly given that the patentee was adding the “exclusion” language to a claim and was referring to “[t]he present invention” in the context of that claim. *See id.* at 6 & A-1; *see also Invitrogen Corp. v. Clontech Labs., Inc.*, 429 F.3d 1052, 1078 (Fed. Cir. 2005) (“[T]he prosecution of one claim term in a parent application will generally not limit different claim language in a continuation application.”); *cf. Regents of the Univ. of Minn. v. AGA Med. Corp.*, 717 F.3d 929, 943 (Fed. Cir. 2013) (“When the purported disclaimers made during prosecution are directed to specific claim terms that have been omitted or materially altered in subsequent applications (rather than to the invention itself), those disclaimers do not apply.”) (quoting *Saunders Grp., Inc. v. Comfortrac, Inc.*, 492 F.3d 1326, 1333 (Fed. Cir. 2007)).

Second, Defendants have cited the patentee’s deletion of matter from the specification of the patents-in-suit. In the case of *Abbott Laboratories v. Sandoz, Inc.*, cited by Defendants

during the May 30, 2014 hearing, the court relied at least in part upon the patentee's omission of matter contained in a parent application:

> [T]he specification refers several times to "Crystal A of the compound (I) of the present invention" and offers no suggestion that the recited processes could produce non-Crystal A compounds, even though other types of cefdinir crystals, namely Crystal B, were known in the art. As noted earlier, the Crystal B formulation actually appears in the parent JP '199 application. Thus, Abbott knew exactly how to describe and claim Crystal B compounds. Knowing of Crystal B, however, Abbott chose to claim only the A form in the '507 patent. Thus, the trial court properly limited the term "crystalline" to "Crystal A."
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> * * *
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> In limiting "crystalline" to "Crystal A" in claims 1-5, the Eastern District of Virginia did not improperly import the preferred embodiment into the claims. Initially, Crystal A is the only embodiment described in the specification. As discussed above, the specification's recitation of Crystal A as its sole embodiment does not alone justify the trial court's limitation of claim scope to that single disclosed embodiment. *See Liebel-Flarsheim* [*Co. v. Medrad, Inc.*], 358 F.3d [898,] 906 [(Fed. Cir. 2004)] ("[T]his court has expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment."). In this case, however, the rest of the intrinsic evidence, including the prosecution history and the priority JP '199 application, evince a clear intention to limit the '507 patent to Crystal A . . . .
>
> * * *
>
> The JP '199 application strongly suggests that the '507 patent intentionally excluded Crystal B compounds. As discussed above, the JP '199 application establishes unequivocally that Abbott knew and could describe both Crystal A and Crystal B. Abbott could have retained the disclosure of Crystal B to support the broader claims of the '507 patent, but instead disclosed and claimed A alone.
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> * * *
>
> Given the exclusive focus on Crystal A in the specification as well as the prosecution history of the '507 patent, the Eastern District of Virginia properly limited "crystalline" in claims 1-5 to "Crystal A."
>
> * * *
>
> The Eastern District of Virginia correctly construed the '507 patent's recitation of "crystalline" in each of the asserted claims as limited to Crystal A, as outlined in the specification. Because Abbott scrubbed all references to Crystal B in the '507

> patent's specification, which were present in the '507 patent's parent foreign application, Abbott clearly demonstrated its intent to limit the '507 patent to Crystal A. This intent was further underscored by comments made during prosecution. As such, Abbott is unable to recapture Crystal B through broad claim language or under the doctrine of equivalents.

566 F.3d at 1289-90, 1299 (citation omitted).

Here, by contrast, the patentee's deletion of matter relates less directly to the limitation that Defendants seek to impose. The patentee deleted the following paragraphs during prosecution of the '580 Patent:

> [0042] In an alternative embodiment of the present invention, embedded modulations can be used as a way to *measure transmission line characteristics* between a master transceiver and tributary transceiver as shown in FIG 8. In this embodiment, *both a master transceiver 64 and a tributary transceiver 66a would have the ability to transmit using at least two modulation methods, type A and type B.* In the present example, the primary transmission type is type A. Thus, as shown in FIG. 8, the master transceiver 64 establishes type A as the primary modulation in sequence 150.
>
> [0043] To *switch from type A to type B modulation*, master transceiver 64 transmits a notification sequence 152 to the tributary 66a. Thus, the tributary 66a is notified of an impending change to modulation type B. The switch to type B modulation could be limited according to a specific time interval or for the communication of a particular quantity of data, such as a *test signal*. After notifying the tributary 66a of the change to type B modulation, the master transceiver 64[] transmits test signal sequence 151 using type B modulation.
>
> [0044] In this embodiment, the tributary transceiver can contain logic which enables the tributary 66a to *calculate at least one channel parameter from the test signal sequence 154.* Channel parameters typically include *transmission line characteristics*, such as, for example, loss versus frequency, non-linear distortion, listener echoes, talker echoes, bridge tap locations, impedance mismatches, noise profile, signal-to-noise ratio, group delay versus frequency, cross-talk presence, cross-talk type, etc. Moreover, the tributary transceiver 66a could be configured to communicate a channel parameter back to the master transceiver 64.
>
> [0045] After transmitting the *test signal* sequence 154 to the tributary transceiver 66a, the master transceiver 64 can transmit trailing sequence 156 to the tributary transceiver 66a using type A modulation to indicate the end of the transmission using type B modulation. The master transceiver 64 can then send information to the tributary transceiver 66a using primary modulation type A, as shown by

> training, data and trailing sequences 158, 160 and 162. Likewise, the tributary transceiver 66a can send information to the master transceiver 64 using primary modulation type A, as shown by training, data and trailing sequences 164, 166 and 168.
>
> [0046] In a further alternative embodiment, the master transceiver 64 or tributary transceiver 66a may identify a time period within which *test signal* sequences may be transmitted. This would eliminate the training and trailing sequences which alert the tributary transceiver 66a to the beginning of a new modulation method. The identification of the time period could be initiated by the master transceiver 64 or tributary transceiver 66a and could include a time period noted in the header of a transmission between the tributary transceiver 66a and master transceiver 64.

Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22) (emphasis added); *see id.* at 22 ("The MPEP suggests that the applicant modify the brief summary of the invention and restrict the descriptive subject matter 'so as to be in harmony with the claims.' *MPEP 1302.01*, General Review of Disclosure. Accordingly, Applicant has deleted paragraphs [0042] – [0046].") (square brackets in original); *see also* Dkt. No. 102, Ex. 4 at p. 20 of 44 (RIP19) (Figure 8, illustrating "Trib Type A + B"); Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 4 (RIP3520), 22 (RIP3538) & p. 34 of 34 (RIP3549) (replacing Figure 8).

This deletion of disclosure of "a tributary transceiver 66a [that has] the ability to transmit using at least two modulation methods" is notable, and Defendants argued at the May 30, 2014 hearing that a "test signal" is merely an example of a communication with a bilingual trib. Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22). Nonetheless, Plaintiff has persuasively argued that these paragraphs relate primarily to test signals and to measuring transmission line characteristics rather than to the use of bilingual tribs. The above-quoted *Sandoz* case cited by Defendants is therefore distinguishable, and the patentee's deletion of matter from the specification is of no limiting effect here. *See SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1286 (Fed. Cir. 2005) ("There is no clear and unmistakable

disclaimer if a prosecution argument is subject to more than one reasonable interpretation, one of which is consistent with a proffered meaning of the disputed term.") (internal quotation marks omitted); *see also 01 Communique*, 687 F.3d at 1297 (quoting *SanDisk*).

Defendants also argued at the May 30, 2014 hearing that the patentee removed this matter because it was introduced in a parent continuation-in-part application. Defendants explained that if the claims of the patents-in-suit were found to rely upon this new matter, the claims would not receive benefit of the earliest priority date. Defendants concluded that the patentee deleted these paragraphs from the specification in order to eliminate this risk. Defendants' argument in this regard appears better suited to a written description challenge because validity analysis is not a regular part of claim construction. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction."). Defendants' arguments regarding deletion of matter from the specification are therefore of minimal relevance during the present claim construction proceedings.

In sum, none of the prosecution history cited by Defendants contains any definitive statements that would warrant finding a disclaimer. *See Omega Eng'g v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on *definitive* statements made during prosecution.") (emphasis added). Further, as explained above, the prosecution history is not otherwise sufficiently clear to justify Defendants' narrow interpretation of the present patents-in-suit.

As to the parties' proposed constructions, "[t]he use of the terms 'first' and 'second' is a common patent-law convention to distinguish between repeated instances of an element or limitation." *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir.

2003). Nothing in the nature of "repeated instances" demands the incompatibility that Defendants have proposed. *Cf. id.* ("In the context of claim 1, the use of the terms 'first . . . pattern' and 'second . . . pattern' is equivalent to a reference to 'pattern A' and 'pattern B,' and should not in and of itself impose a serial or temporal limitation onto claim 1."). Although the above-quoted disclosures in the specification contemplate a trib that can use only one modulation method, nothing in the claim language warrants limiting the disputed terms to such a narrow construction.

The doctrine of claim differentiation also weighs against requiring incompatibility because such a limitation appears in dependent Claims 18 and 75 of the '580 Patent, which recite:

> 18. The device of claim 15, wherein the intended destination is the first type of receiver and unable to demodulate the second modulation method.
>
> * * *
>
> 75. The device of claim 72, wherein the intended destination is the first type of receiver and unable to demodulate the second modulation method.

The doctrine of claim differentiation weighs against any construction of the disputed terms that would render these dependent claims superfluous. *See Phillips*, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim."); *see also Liebel-Flarsheim*, 358 F.3d at 910 ("[W]here the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest."); *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001) ("Claim differentiation, while often argued to be controlling when it does not apply, is clearly applicable when there is a dispute over whether a limitation found in a dependent claim should be read into

an independent claim, and that limitation is the only meaningful difference between the two claims.").

Defendants have countered that "any presumption created by the doctrine of claim differentiation will be overcome by a contrary construction dictated by the written description or prosecution history." *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011) (citations and internal quotation marks omitted); *accord Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1381 (Fed. Cir. 2006) ("[C]laim differentiation can not broaden claims beyond their correct scope.") (citation and internal quotation marks omitted). On balance, *Retractable* is distinguishable because the above-discussed specification disclosures and prosecution history are not so clear as Defendants have urged. *See Retractable*, 653 F.3d at 1305 (noting that disclosures "recite that 'the invention' has a body constructed as a single structure, expressly distinguish the invention from the prior art based on this feature, and only disclose embodiments that are expressly limited to having a body that is a single piece").

As to the proper construction, Defendants' proposal of "type of receiver" is vague and confusing because it is unclear whether "type" refers to the modulation method or to some other, unspecified characteristic of the receivers.

Also, Plaintiff properly argues that "encoding" is different than "modulation." For example, Plaintiff submits that the word "encode" can be defined as "to encrypt" or as "to use a code, frequently one composed of binary numbers, to represent individual characters or groups of characters in a message." *Id.*, Ex. 4, *Modern Dictionary of Electronics* 341 (6th ed. 1997); *id.*, Ex. 5, *Microsoft Press Computer Dictionary* 175 (3d ed. 1997); *see id.*, Ex. 11, John G. Proakis & Masoud Salehi, *Communication Systems Engineering* 8-11 (1994); *see also id.*, Ex. 12, Bernard Sklar, *Digital Communications: Fundamentals and Applications* 6-7 (1988).

"Modulation," by contrast, is defined as a process of varying some characteristic of a carrier signal. *See* Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 662 (6th ed. 1996) ("The process by which some characteristic of a carrier is varied in accordance with a modulating wave"); *see also id.*, Ex. 4, *Modern Dictionary of Electronics* 633 (6th ed. 1997) ("The process, or results of the process, whereby some characteristic of one signal is varied in accordance with another signal. The modulated signal is called the carrier and may be modulated in three fundamental ways: by varying the amplitude (amplitude modulation) by varying the frequency (frequency modulation) or by varying the phase (phase modulation)."); *id.*, Ex. 5, *Microsoft Press Computer Dictionary* 313 (3d ed. 1997) ("The process of changing or regulating the characteristics of a carrier wave vibrating at a certain amplitude (height) and frequency (timing) so that the variations represent meaningful information."); *id.*, Ex. 6, D.K. Sharma, et al., *Analog & Digital Modulation Techniques: An Overview* 551 (2010) ("Modulation is the process of varying some parameter of a periodic waveform in order to use that signal to convey a message."); Dkt. No. 102, Ex. 9 at RIP13523 ("Modulation is the process of encoding source data onto a continuous constant frequency signal i.e. carrier signal with frequency fc."). The specification, too, refers to a carrier in relevant contexts. *See* '580 Patent at 1:57 & 2:4. Finally, during oral argument as to the "different type" terms, Defendants themselves referred to modulating data onto a carrier.

Thus, even though Plaintiff itself included the word "encoding" in previously proposed constructions, Defendants' proposals of "encoding" are rejected as tending to confuse rather than clarify the scope of the claims. *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.").

The Court, having rejected Defendants' proposed constructions for the reasons set forth above, hereby construes the disputed terms as set forth in the following chart:

Term	Construction
"first modulation method"	**"a first method for varying one or more characteristics of a carrier signal in accordance with information to be communicated"**
"second modulation method"	**"a second method for varying one or more characteristics of a carrier signal in accordance with information to be communicated"**

B. "modulation method [] of a different type" and "different types of modulation methods"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"different families of modulation techniques"	"modulation methods that are incompatible with one another"

Dkt. No. 97 at 17; Dkt. No. 102 at 16. The parties submit that these terms appear in Claims 1 and 58 of the '580 Patent and Claims 1, 22, and 26 of the '228 Patent. Dkt. No. 81, Ex. A at 5.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for these disputed terms: "different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods." Plaintiff had no opposition to the preliminary construction. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that during prosecution, the patentee defined these disputed terms by referring to "two types of modulation methods, *i.e.*, different families of modulation techniques." Dkt. No. 97 at 18. Plaintiff further argues that "Defendants' construction, which only requires 'incompatibility,' has no concept of a group of things having common characteristics. Such a construction effectively reads the word 'type' right out of the claims, rendering it superfluous." *Id.* at 19-20.

Defendants respond:

> As noted above [as to the "first" and "second" modulation methods], the whole purpose of the purported invention is to enable two (or more) trib modems to use different modulation methods on the same circuit. The crucial characteristic of the different modulation methods vis-à-vis one another is that they are incompatible. If they were compatible, there would be no problem for the patents to solve.

Dkt. No. 102 at 16. Defendants also note that the word "family" does not appear in the specification. *Id.* at 17. Defendants suggest that the patentee used the phrase "families of modulation techniques" only in prosecution history remarks—and not in the claims—because "[i]njecting that phrase into [a] claim would have rendered it plainly unsupported by the specification and opened this portion of the claim to a written description challenge." *Id.* at 18. Defendants argue that Plaintiff's authorities regarding the use of "i.e." are applicable only to use of "i.e" in the specification, not the prosecution history. *Id.* at 19. Defendants further argue that "Defendants' construction[] gives full meaning to the word 'type,' by requiring incompatibility." *Id.* Finally, Defendants submit that Plaintiff's proposal of "families" "only raises the further question of what constitutes a family of modulation methods." *Id.* at 20.

Plaintiff replies that the patentee's definition in the prosecution history is supported by disclosures of FSK (frequency-shift keying) and QAM (quadrature amplitude modulation) in the

specification and in related applications cited by the specification. Dkt. No. 103 at 6. Plaintiff also argues that "nothing in the specification—certainly not the passages Defendants cite—reflects the kind of 'clear and unmistakable' intent necessary to depart from the ordinary meaning and define 'type' as 'incompatibility.'" *Id.* at 6-7 (citing *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012)).

At the May 30, 2014 hearing, Defendants argued that "family" is a much broader term than "type" because modulation methods could be grouped together in any number of ways, such as analog as opposed to digital or phase modulation as opposed to frequency modulation. Defendants also argued that Plaintiff's interpretation is inconsistent with dependent Claim 43 of the '228 Patent, which recites that "at least one" of the first and second modulation methods uses phase modulation.

Plaintiff responded by reiterating that Defendants' proposed construction fails to give meaning to the constituent term "type." Plaintiff also argued that Defendants' proposal is overly restrictive because it could be read to mean that different FM radio stations use "incompatible" methods merely because they transmit at different frequencies. Plaintiff urged that the claims contemplate the use of non-incompatible modulation methods so long as they are different.

(2) Analysis

The Summary section of the specification states: "Another advantage of the present invention is that a master transceiver can communicate seamlessly with tributary transceivers or modems using *incompatible modulation methods*." *Id.* at 2:55-57 (emphasis added). Nonetheless, "[t]he court's task is not to limit claim language to exclude particular devices because they do not serve a perceived 'purpose' of the invention. . . . An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that

invention be limited to encompass all of them." *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 (Fed. Cir. 2003); *accord Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1345 (Fed. Cir. 2008) (discussing *E-Pass*). Defendants' proposal that different "types" of modulation methods must be "incompatible" would improperly limit the claims to a preferred embodiment. *See Comark*, 156 F.3d at 1187.

Moreover, although it appears in the Summary of the specification as quoted above, the word "incompatible" is unclear and, as Plaintiff has argued, would tend to raise issues concerning the manner or degree of compatibility. Along those lines, uncertainty might arise as to whether modulation methods must be completely incompatible in all respects or could instead be partially compatible. At the May 30, 2014 hearing, the Court expressed concern as to the clarity of "incompatible." Defendants responded that the disputed terms require that the modulation methods be different "waveforms," different "ways to modulate" data onto a carrier, or simply "not the same." These suggestions, however, merely restate that the methods are "different." This adds little, if anything, to the disputed terms themselves, which recite "modulation method [] of a different type" and "different types of modulation methods." Defendants' proposal of "incompatible" is therefore rejected.

The Court turns to whether Plaintiff is correct that the patentee gave the disputed terms an "express definition." Dkt. No. 97 at 19.

"The specification acts as a dictionary 'when it expressly defines terms used in the claims or when it defines terms by implication.'" *Bell Atl. Network Servs.*, 262 F.3d at 1268 (quoting *Vitronics Corp.*, 90 F.3d at 1582). "When a patentee acts as his own lexicographer in redefining the meaning of particular claim terms away from their ordinary meaning, he must clearly express that intent in the written description. We have repeatedly emphasized that the statement in the

specification must have sufficient clarity to put one reasonably skilled in the art on notice that the inventor intended to redefine the claim term." *Merck*, 395 F.3d at 1370 (citations omitted). "[A] patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term is clearly stated in the patent specification or file history." *Vitronics*, 90 F.3d at 1582.

During prosecution, the patentee amended claims so as to add the word "type," and the patentee stated:

> Applicant thanks Examiner Ha for the indication that claims 1-18 and 37-57 are allowed (office action, p. 7). Applicant has further amended claims 1-2, 9-15, 18, 37-38, and 45-46 with additional recitations to more precisely claim the subject-matter. For example, the language of independent claim 1 has been clarified to refer to two *types* of modulation methods, *i.e.*, different families of modulation techniques, such as the FSK [(frequency shift keying)] family of modulation methods and the QAM [(quadrature amplitude modulation)] family of modulation methods.

Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536); *see id.* at 7 (RIP3523) (amending claims). Generally, "i.e." signals an explicit definition. *See, e.g., Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1327, 1330 (Fed. Cir. 2003) (finding that the patentee used "i.e." to define a term not known in the art at the relevant time); *but see Pfizer, Inc. v. Teva Pharm., USA, Inc.*, 429 F.3d 1364, 1373 (Fed. Cir. 2005) (specification referred to "saccharides (i.e. sugars)" but also contained further discussion under a section titled "Saccharides," and the court concluded that "the patentee clearly intended for this section to address the meaning of the same term").

The significance of the patentee's use of "i.e." in the prosecution history—as opposed to in the specification—is perhaps less clear. On one hand, some authorities caution against relying upon potentially "self-serving" statements in the prosecution history. *See Biogen, Inc. v. Berlex Labs.*, 318 F.3d 1132, 1140 (Fed. Cir. 2003) ("Representations during prosecution cannot enlarge

the content of the specification, and the district court was correct in relying on the specification in analyzing the claims."); *see also Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1270 (Fed. Cir. 1986) ("For example, a Citation [of Prior Art] filed [with the PTO] during litigation might very well contain merely self-serving statements which likely would be accorded no more weight than testimony of an interested witness or argument of counsel. Issues of evidentiary weight are resolved on the circumstances of each case."). Also, as Defendants have pointed out, dependent Claim 43 of the '228 Patent is at least somewhat at odds with Plaintiff's interpretation to the extent that it would require that only one, instead of "at least one," of the first and second modulation methods can be phase modulation.

On the other hand, a "claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification *or prosecution history*." *CCS Fitness v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (emphasis added); *accord Home Diagnostics*, 381 F.3d at 1356; *Advanced Fiber Techs. (AFT) Trust v. J&L Fiber Servs., Inc.*, 674 F.3d 1365, 1374 (Fed. Cir. 2012); *see Vitronics*, 90 F.3d at 1582 (quoted above). Such authorities weigh in favor of construing the disputed term in accordance with the patentee's express definition in the prosecution history.

At the May 30, 2014 hearing, Defendants urged that because the patentee's definition was set forth after the examiner had indicated that the claims were allowable, the definition was self-serving and was not part of the usual back-and-forth negotiation that informs the meaning of claim terms. Plaintiff properly countered, however, that the patentee provided the definition in connection with amending some of the claims so as to introduce the word "types." *See* Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536) (quoted above); *see also id.* at 7 (RIP3523) (amending claims). Thus, to whatever extent Defendants are correct that

the prosecution history can only define a term in the context of developing allowable claims, the patentee's definition in this case can properly be considered.

The patentee's express definition is also consistent with disclosure in the specification of various categories of modulation methods. *See* '580 Patent at 2:1-8 ("some applications (e.g., internet access) require high performance modulation, such as quadrature amplitude modulation (QAM), carrier amplitude and phase (CAP) modulation, or discrete multitone (DMT) modulation"); *see also id.* at 5:17-20 (similar).

Such a definition is also consistent with the extrinsic dictionary definitions submitted by Plaintiff, which define "type" as "a class, kind, or group set apart by common characteristics" and "family" as "a group of things having common characteristics." Dkt. No. 97, Ex. 22, *Merriam-Webster's Dictionary and Thesaurus* 291, 858 (2007); *see id.*, Ex. 23, *The American Century Thesaurus* 129 (1995) (listing "type" as a synonym for "family").

On balance, the patentee's lexicography should be given effect in the Court's construction. *See Vitronics*, 90 F.3d at 1582; *see also Abbott Labs.*, 323 F.3d at 1327, 1330; *CCS Fitness*, 288 F.3d at 1366; *Advanced Fiber Techs.*, 674 F.3d at 1374. As to Defendants' concerns, any dispute regarding whether accused modulation techniques are from different "families" is a factual dispute regarding infringement rather than a legal dispute for claim construction. *See PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) (noting that "the task of determining whether the construed claim reads on the accused product is for the finder of fact").

Nonetheless, although Plaintiff proposes merely "different families of modulation techniques," the patentee's definition in the prosecution history includes examples, namely "the

FSK family of modulation methods and the QAM family of modulation methods."[5] Dkt. No. 97, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 20 (RIP3536). These examples provide useful context for understanding the phrase "different families" and, having been provided as part of the patentee's definition, should be included in the Court's construction.

The Court accordingly hereby construes **"modulation method [] of a different type"** and **"different types of modulation methods"** to mean **"different families of modulation techniques, such as the FSK family of modulation methods and the QAM family of modulation methods."**

C. "communication[s] device," "device that transmits," and "logic configured to transmit"

"communication[s] device"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies. Alternatively: "a device that sends or receives information"	Samsung: "a device that sends or receives information over wires" BlackBerry: "a device that sends or receives information over wires in a circuit-switched network"
"device that transmits"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies. Alternatively: "a device that sends information"	Samsung: "a device that sends information over wires" BlackBerry: "a device that sends information over wires in a circuit-switched network"

[5] The meanings of "FSK" and "QAM" do not appear to be in dispute.

"logic configured to transmit"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies. Alternatively: "logic configured to send information"	Samsung: "logic configured to send information over wires" BlackBerry: "logic configured to send information over wires in a circuit-switched network"

Dkt. No. 97 at 20; Dkt. No. 102 at 23. The parties submit that the first of these terms appears in Claims 1, 23, 32, and 58 of the '580 Patent and all asserted claims of the '228 Patent. Dkt. No. 81, Ex. A at 11. The parties further submit that the second of these terms appears in Claim 40 of the '580 Patent and that the third appears in Claims 49 and 54 of the '580 Patent. *Id.* at 14 & 16.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "communication[s] device" means "a device that sends or receives information"; "device that transmits" means "a device that sends information"; and "logic configured to transmit" means "logic configured to send information." Plaintiff had no objection to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "[t]he words in these terms do not have specialized meanings, have not been otherwise defined by the patentee, and are easily understood based on their ordinary meaning." Dkt. No. 97 at 21. As to Defendants' proposals of "wires" and a "circuit-switched network," Plaintiff responds that such constructions are contrary to the recital in the claims of a

generic "communication medium." *Id.* at 22. Plaintiff urges that the brief mention of wires in the specification is insufficient to redefine the disputed terms. *Id.* at 22-23. To the contrary, Plaintiff argues, during prosecution the patentee deleted text from the specification that referred to "lines." *Id.* at 23. Finally, Plaintiff notes that the words "circuit" and "switched" do not appear in the claims or the written description. *Id.* at 24.

Defendants respond that "[w]ireless networks are never mentioned in the patents-in-suit," despite wireless networks being well-known at the time the patent applications were filed, and "[t]he only example of a network mentioned in the text of the patents is a two-wired system of the prior art, upon which the alleged invention of the patents is an improvement." Dkt. No. 102 at 23; *see id.* at 24. Defendants also express concern that Plaintiff's proposed constructions "provide no boundaries, and as read could encompass a tin can connected to a string." *Id.* at 24. Finally, Defendant Blackberry proposes that the claimed invention is limited to circuit-switched networks because, "by design," "[d]evices on a packet-switched network can use different communication languages or modulation methods." *Id.* at 25. Blackberry cites several extrinsic treatises in support of this proposition and concludes that "[p]ut simply, in a packet-switched network there is no compatibility problem for the patents to solve, and the purported invention is unnecessary." *Id.* at 25-26.

Plaintiff replies that the patents-in-suit "do not limit the invention to wired or wireless 'modems'/'communication media' because both were well-known at the time." Dkt. No. 103 at 8 (citations and footnote omitted). Plaintiff also argues: "Defendants read too much into the Figures. Communications medium 94 is depicted as a line in Figs. 3-4, but that does not imply a wire any more than the absence of a line implies wireless." *Id.* at 8 n.7. As to Blackberry's proposal, Plaintiff replies that the patents-in-suit do not refer to "circuit-switched" or "packet-

switched" networks because "the patents-in-suit are not concerned with low-level network switching protocols, but rather with 'sending transmissions modulated using at least two types of modulation methods.'" *Id.* (quoting '580 Patent at 2:30-31). Plaintiff also submits that "Blackberry has zero evidence to support its claim that devices on a packet-switched network can use different [] modulation methods by design." *Id.* (quoting Dkt. No. 102 at 25).

At the May 30, 2014 hearing, Defendants again highlighted the use of a solid line in the Figures to illustrate the communication medium. Defendants argued that the appropriate way to illustrate wireless communication would have been with an antenna or with a series of three closely-spaced curved lines. Defendants also noted that the provisional patent application refers to a "two-wire" modem. *See* Dkt. No. 97, Ex. 13 at 5. Finally, Defendant Blackberry presented no oral argument on its proposals of "circuit-switched" and instead submitted its proposed constructions on the briefing.

(2) Analysis

Although Plaintiff has proposed that no constructions are required, the parties have presented a "fundamental dispute regarding the scope of . . . claim term[s]," and the Court has a duty to resolve that dispute. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362-63 (Fed. Cir. 2008).

As a threshold matter, Defendants have not argued that their proposals of a wired network or a circuit-switched network are supported by anything within the claims at issue. The issue, then, is whether Defendants' proposed limitations are adequately supported by anything in the specification or the extrinsic evidence cited by the parties.

As to Defendants' proposals of requiring a wired network, the specification only once refers to wires:

> The foregoing discussion is based on a two-wire, half-duplex multipoint system. Nevertheless, it should be understood that the concept is equally applicable to four-wire systems.

'580 Patent at 4:51-54. This passage is insufficient to limit the claims to wired networks, particularly given that it refers to a discussion of only one or two of the Figures. *See id.* at 3:40-4:50; *see also Comark*, 156 F.3d at 1187. Moreover, Defendants have acknowledged that the "foregoing discussion" referred to in this passage is a discussion of "a two-wired system of the prior art." Dkt. No. 102 at 23.

In several other instances, the specification refers to a "communication medium," but those disclosures do not address whether the medium is wired or wireless. *See* '580 Patent at 2:52-54 ("One advantage of the present invention is that it provides to [*sic*, for] the use of a plurality of modem modulation methods on the same communication medium."), 3:40-44 ("With reference to FIG. 1, a prior art multipoint communication system 22 is shown to comprise a master modem or transceiver 24, which communicates with a plurality of tributary modems (tribs) or transceivers 26-26 over communication medium 28.") & 5:44-46 ("The master transceiver 64 communicates with trib 66 over communication medium 94.").

Defendants also argue that Figures 3 and 4 depict a wired network because the "communication medium 94" is illustrated by either solid line connectors (Figure 3) or a solid line (Figure 4). *See* Dkt. No. 102 at 24. First, as Plaintiff has urged, any argument that solid lines cannot represent a wireless network is conclusory speculation. Second, even if Figures 3 and 4 were interpreted as depicting a wired network, "patent coverage is not necessarily limited to inventions that look like the ones in the figures. To hold otherwise would be to import limitations [i]nto the claim[s] from the specification, which is fraught with danger." *MBO Labs. Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007).

Thus, the specification does not support limiting the claims to wired networks. This conclusion is reinforced by prosecution history in which the examiner rejected claims that recited a "communications device" and "logic configured to transmit" based on the "Siwiak" reference, which discloses a *wireless* communications system. Dkt. No. 97, Ex. 14, 9/1/2010 Office Action at 2-4 (RIP72-74); *id.*, Ex. 20 at 13 & 20 (RIP23 & RIP30) (application claims); *see id.*, Ex. 15, U.S. Pat. No. 5,537,398 (Siwiak) at 2:24-41 ("The messaging system includes a plurality of geographically distributed messaging transmitters, each comprising means for generating a radio frequency signal."); *see also Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005) ("Statements about a claim term made by an Examiner during prosecution of an application may be evidence of how one of skill in the art understood the term at the time the application was filed."). Finally, although the weight that the specification amendments should be given here is unclear, it is worth noting that the patentee *deleted* paragraphs from the specification that referred to "transmission *line* characteristics." *Id.*, Ex. 9, 3/1/2011 Reply Pursuant to 37 CFR § 1.111 at 5-6 (RIP3521-22) (emphasis added).

As to extrinsic evidence, Plaintiff has submitted two news articles from the relevant time period that use the phrase "wireless modem." Dkt. No. 103, Ex. 33, *Ericsson announces its M2190 OEM Wireless Modem, first PCMCIA modem for mobile data connectivity*, Business Wire, Nov. 2, 1994; *id.*, Ex. 34, *A Wireless Modem that Could Leave 'Em in the Dust*, BusinessWeek, Feb. 24, 1997. Use of the word "modem" in the patents-in-suit is therefore insufficient to require a wired network. Finally, Plaintiff has submitted a dictionary definition of "medium," in the context of "information transfer," as not being limited to wires but rather being any "vehicle capable of transferring data." Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 643 (6th ed. 1996).

In sum, Defendants have failed to justify limiting the claims to wired networks. The Court therefore turns to the additional proposals by Defendant Blackberry.

Blackberry has submitted extrinsic evidence in support its argument that the claimed invention only has relevance in circuit-switched networks, not packet-switched networks. Dkt. No. 102, Ex. 11, Gurdeep S. Hura & Mukesh Singhal, *Data and Computer Communications: Networking and Internetworking* 130-31 (2001) ("In the case of packet-switched networks, stations with different data rates can communicate with each other, and the necessary conversion between different data rates is done by the network, while in the case of circuit-switched networks, both stations must have the same data rate."); *id.*, Ex. 12, William Stallings, *Data and Computer Communications* 254-55 (5th ed. 1997) ("In [a] circuit-switching network, the connection provides for transmission at a constant data rate. Thus, each of the two devices that are connected must transmit and receive at the same data rate as the other . . . ."; "A packet-switching network can perform data-rate conversions. Two stations of different data rates can exchange packets because each connects to its node at its proper data rate."); *id.*, Ex. 13, Youlu Zheng & Shakil Akhtar, *Networks for Computer Scientists and Engineers* 125 (2002) ("Whereas . . . two networks connected by a circuit switch must operate at the same speed, packet switching can connect networks operating at different speeds.").

A circuit-switched network, at least in the context of Blackberry's proposals, appears to be a species of wired network. The Court therefore rejects Blackberry's proposals based on the Court's rejection of Defendants' proposals of "over wires," above.

Alternatively, even if Blackberry is proposing a circuit-switched network limitation that can be either wired or wireless, Blackberry's above-cited reliance on extrinsic evidence is disfavored. *See Phillips*, 415 F.3d at 1322 ("There is no guarantee that a term is used in the same

way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.").

As to Blackberry's reliance on the purpose of the invention (avoiding the inefficiencies of requiring all devices to use the same modulation method), Blackberry is correct as a general matter that "the problem the inventor was attempting to solve, as discerned from the specification and the prosecution history, is a relevant consideration." *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1160 (Fed. Cir. 1997).

Nonetheless, "[t]he court's task is not to limit claim language to exclude particular devices because they do not serve a perceived 'purpose' of the invention. . . . An invention may possess a number of advantages or purposes, and there is no requirement that every claim directed to that invention be limited to encompass all of them." *E-Pass*, 343 F.3d at 1370; *accord Howmedica*, 540 F.3d at 1345 (discussing *E-Pass*).

Blackberry has also cited *Applied Materials, Inc. v. Advanced Semiconductor Materials America, Inc.*, 98 F.3d 1563, 1573 (Fed. Cir. 1996). In *Applied Materials*, the patent specification disclosed a problem of electrostatic contamination in the context of a "cold purge" from a chamber:

> As explained in the . . . specification, static charges are not a problem during subsequent purges of the chamber because after the initial steps the temperature of the chamber remains above about 180° C, the temperature above which static charges do not exist.
>
> In the invention of the . . . patent, static charges during the initial "cold" purges are eliminated by operating the lamps at a low level during the initial gas flow steps.
>
> * * *
>
> The district court found that "cold purge process" means temperatures below 180° C, and that the . . . invention was directed to the use of heat sufficiently high to remove electrostatic contamination in the initial purge steps, that is, heat above

> about 180° C, in a reactor whose operating conditions include temperatures below 180° C. "Cold purge" is interpreted in light of the problem the . . . patent solved: the elimination of electrostatic contamination during the initial purge step.

Id. at 1571, 1573. The limitation imposed in *Applied Materials* was thus founded on *intrinsic* disclosures regarding circumstances in which the stated problem presented itself. Here, by contrast, Blackberry relies upon *extrinsic* evidence in support of the proposed "circuit-switched" limitation. The patents-in-suit contain no reference to circuit-switched networks. *Applied Materials* is therefore distinguishable.

The Court accordingly rejects Defendants' proposed "over wires" and "circuit-switched" limitations. The parties are otherwise in agreement as to the proper meaning of the disputed terms, as set forth by Plaintiff's alternative proposed constructions. Although the plain and ordinary meaning of the disputed terms may well be readily understandable once Defendants' proposed limitations have been rejected, the existence of common ground in the parties' proposals is notable and should be given effect.

As to Defendants' statement that Plaintiff's proposals would "encompass a tin can connected to a string" (Dkt. No. 102 at 24), Defendants' concern is unwarranted because other claim language appropriately limits the scope of the claims. Further, to whatever extent Defendants' concern relates to validity, such arguments are of limited relevance during claim construction proceedings. *See Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.").

For all of these reasons, the Court hereby construes the disputed terms as set forth in the following chart:

Term	Construction
"communication[s] device"	**"a device that sends or receives information"**
"device that transmits"	**"a device that sends information"**
"logic configured to transmit"	**"logic configured to send information"**

D. "training signal" and "trailing signal"

"training signal"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a transmission that signifies the beginning of a communication session"	"a distinct transmission that establishes properties of a subsequent data transmission and that can have a different intended destination from the subsequent data transmission"
"trailing signal"	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a transmission that signifies the end of a communication session"	"a distinct transmission that follows a data transmission and that can have a different intended destination from the data transmission"

Dkt. No. 97 at 24; Dkt. No. 102 at 20. The parties submit that the first of these disputed terms appears in dependent Claims 29, 31, and 36 of the '228 Patent. Dkt. No. 81, Ex. A at 20. The parties submit that the second of these disputed terms appears in dependent Claim 51 of the '228 Patent. *Id.* at 21.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary constructions for these disputed terms: "training signal" means "a

transmission that signifies the beginning of a transmission sequence and determines one or more properties of the transmission sequence"; and "trailing signal" means "a transmission that signifies the end of a transmission sequence." Plaintiff had no opposition to these preliminary constructions. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that Defendants' proposals "improperly limit the claims to part of a preferred embodiment, in which some training and trailing signals 'can have a different intended destination from the subsequent data transmission.'" Dkt. No. 97 at 25. Plaintiff explains that "[w]hile in a preferred embodiment some of the training and trailing signals have a different intended destination than the data transmission, others do not." *Id.* at 26 (discussing '580 Patent at Figure 8). Plaintiff also argues that Defendants' proposal of "distinct" is vague and "has zero support in the record." Dkt. No. 97 at 25 & 27. Plaintiff submits that "[t]he specification focuses on the order and function of the components—not their 'distinctness.'" *Id.* at 27.

As to "training signal," Defendants respond that the "capab[ility] of having a different intended destination from the subsequent data transmission" is "central to the alleged invention." Dkt. No. 102 at 20. Defendants explain:

> [T]he purpose of the purported invention is to enable two (or more) tribs to use different modulation methods on the same circuit. The alleged invention accomplishes this via a training signal. When the master intends to send data to a type B trib, it first sends a training signal to the type A trib. []'580 patent[] at 6:3-6. The training signal notifies the type A trib that the master will switch to type B modulation. *Id.* In response to the training signal, the type A trib temporarily stops listening to signals on the line. *Id.* at 6:41-46. The master then transmits data to the type B trib using type B modulation. *Id.* at 6:8-12.
>
> Since the type A trib is not listening during the type B transmission, the type A trib — which does not understand type B modulation — does not attempt to decode the type B transmission. This avoids errors and delays caused by tribs trying to decode signals they do not understand. Moreover, the type B trib never

> receives the training signal, because it is only sent using type A modulation, which the type B trib does not understand. *See id.* at 5:67-6:2.

Dkt. No. 102 at 21. As to their proposal of a "distinct" transmission, Defendants argue that the specification "uniformly depicts the training signal as a discrete communication." *Id.* at 22 (citing '580 Patent at Fig. 5).

As to "trailing signal," Defendants respond that "the specification teaches that, just as the training signal notifies a type A trib of an impending change to type B modulation, the trailing signal notifies the type A trib that the type B data transmission is over. The trailing signal must be capable of having a different intended destination from the corresponding data transmission for the same reasons as the training signal." Dkt. No. 102 at 22 (citing '580 Patent at 6:16-19). Finally, Defendants emphasize that their proposals "state that the training and trailing signals '*can* have' different intended destinations from the intervening data transmissions, not that they must." *Id.* at 23.

Plaintiff replies that although one of the disclosed embodiments is consistent with Defendants' proposed constructions, Figure 8 illustrates a "communication session 170" in which "the training signal, communication signal, and trailing signal all have the same intended destination—the Type A transceiver." Dkt. No. 103 at 9. Finally, Plaintiff argues that "the specification focuses on the order and function of the transmitted components, not whether they are 'distinct.'" *Id.*

At the May 30, 2014 hearing, Defendants reiterated that the destinations need not necessarily be different. Nonetheless, Defendants explained, that capability is a limitation because the central purpose of a training signal is to instruct a trib to ignore a subsequent transmission. Defendants also submitted that they would be amenable to substituting the word "discrete" for the word "distinct" in Defendants' proposed constructions.

Plaintiff responded that a "training signal" can also be useful for enabling a master to change modulation methods when communicating with a bilingual trib, perhaps to overcome interference by using a more robust modulation method.

(2) Analysis

The disputed terms appear in Claims 29, 31, 36, and 51 of the '228 Patent, which recite (emphasis added):

> 29. The master communication device as in claim 26, wherein the first transmission sequence includes a *training signal*.
>
> * * *
>
> 31. The master communication device as in claim 29, wherein the *training signal* establishes signal level compensation.
>
> * * *
>
> 36. The master communication device as in claim 29, wherein the *training signal* includes parameters for the selection of optional features.
>
> * * *
>
> 51. The master communication device as in claim 26, wherein the master communication device is configured to transmit a *trailing signal* to complete the master communication transmission.

Nothing in these dependent claims requires that the recited "training signal" or "trailing signal" must be capable of having a different intended destination than the data transmission. Claims 31 and 36 depend from Claim 29, which in turn depends from independent Claim 26. Claim 26 recites the antecedent basis for "the first transmission sequence" recited in Claim 29 (emphasis added; formatting modified):

> 26. A master communication device configured to communicate according to a master/slave relationship in which a slave communication from a slave device to the master communication device occurs in response to a master communication from the master communication device to the slave device, the master communication device comprising:

a transceiver configured to *transmit signals over a communications medium to a slave device using at least two different types of modulation methods* and to receive one or more responses over the communication medium that comprise at least respective response data that is modulated according to one of the at least two different types of modulation methods, the at least two different types of modulation methods comprising a first modulation method and a second modulation method,

wherein the transmitted signals comprise first transmitted signals and second transmitted signals,

the first transmitted signals comprise at least two transmission sequences,

the at least two transmission sequences include *a first transmission sequence* and *a second transmission sequence,*

the transceiver is configured to *transmit the first transmission sequence using the first modulation method*, and

the transceiver is configured to *transmit the second transmission sequence using the second modulation method* wherein:

the first transmission sequence includes information that is indicative of an impending change in modulation method from the first modulation method to the second modulation method,

the second transmission sequence includes a payload portion that is transmitted after the first transmission sequence,

the first transmitted signals include first address information that is indicative of the slave device being an intended destination of the payload portion,

the second transmitted signals comprise at least a third transmission sequence and a fourth transmission sequence,

the transceiver is configured to transmit the third transmission sequence using the first modulation method,

the transceiver is configured to transmit the fourth transmission sequence using the first modulation method,

the third transmission sequence includes information indicative that the fourth transmission sequence will be transmitted using the first modulation method,

the fourth transmission sequence includes a second payload portion that is transmitted after the third transmission sequence, and

the second transmitted signals include second address information that is indicative of a specified slave device being an intended destination of the second payload portion.

Claim 26 thus recites "first transmitted *signals*" that include a "first transmission *sequence*" using a first modulation method and a "second transmission *sequence*" using a second modulation method. The "first transmission sequence" indicates a change from the first modulation method to the second modulation method, and "the second transmission sequence

includes a payload portion that is transmitted after the first transmission sequence." The "first transmitted *signals*" also "include first address information that is indicative of the slave device being an intended destination of the payload portion." Claim 26 further recites "second transmitted signals" with limitations comparable to those of the "first transmitted signals," except that both transmission sequences are transmitted using the first modulation method.

Nowhere does Claim 26 recite that the first transmission sequence must be able to have an intended destination different from that of the subsequent payload. Claim 26 thus contains no support for imposing any such limitation on the "training signal" that is recited in dependent Claims 29, 31, and 36. Similarly, nothing in the claims suggests any such limitation as to the "trailing signal" recited in Claim 51.

Defendants have submitted that, in some cases, disclosure of a critical feature for achieving a central objective can warrant limiting the claims accordingly. *See Alloc*, 342 F.3d at 1369-70 (noting that the "specification . . . criticizes prior art floor systems without play" and finding that the "specification read as a whole leads to the inescapable conclusion that the claimed invention must include play in every embodiment"); *see also Honeywell Int'l, Inc. v. ITT Indus.*, 452 F.3d 1312, 1318 (Fed. Cir. 2006) ("The written description's detailed discussion of the prior art problem addressed by the patented invention, viz., leakage of non-metal fuel filters in EFI [(electronic fuel injection)] systems, further supports the conclusion that the fuel filter is not a preferred embodiment, but an only embodiment.").

This is not such a case. The specification uses the terms "training signal," "training sequence," "trailing signal," and "trailing sequence" several times but does not mandate that such signals or sequences be capable of having a different intended destination than a data transmission. For example, the specification discloses:

[B]efore any communication can begin in [prior art] multipoint system 22, the master transceiver and the tribs 26-26 must agree on a common modulation method. If a common modulation method is found, the master transceiver 24 and a single trib 26 will then exchange sequences of signals that are particular subsets of all signals that can be communicated via the agreed upon common modulation method. These sequences are commonly referred to as *training signals* and can be used for the following purposes: 1) to confirm that the common modulation method is available, 2) to establish received signal level compensation, 3) to establish time recovery and/or carrier recovery, 4) to permit channel equalization and/or echo cancellation, 5) to exchange parameters for optimizing performance and/or to select optional features, and 6) to confirm agreement with regard to the foregoing purposes prior to entering into data communication mode between the users. In a multipoint system, the address of the trib with which the master is establishing communication is also transmitted during the training interval. At the end of a data session a communicating pair of modems will typically exchange a sequence of signals known as *trailing signals* for the purpose of reliably stopping the session and confirming that the session has been stopped. In a multipoint system, failure to detect the end of a session will delay or disrupt a subsequent session.

Referring now to FIG. 2, an exemplary multipoint communication session is illustrated through use of a ladder diagram. This system uses polled multipoint communication protocol. That is, a master controls the initiation of its own transmission to the tribs and permits transmission from a trib only when that trib has been selected. At the beginning of the session, the master transceiver 24 establishes a common modulation as indicated by sequence 32 that is used by both the master 24 and the tribs 26a, 26b for communication. Once the modulation scheme is established among the modems in the multipoint system, [t]he master transceiver 24 transmits a *training sequence 34* that includes the address of the trib that the master seeks to communicate with. In this case, the *training sequence 34* includes the address of trib 26a. As a result, trib 26b ignores *training sequence 34*. After completion of the *training sequence 34*, master transceiver 24 transmits data 36 to trib 26a followed by *trailing sequence 38, which signifies the end of the communication session.* Similarly, with reference to FIG. 8, the sequence 170 illustrates a Type A modulation *training signal*, followed by a Type A modulation data signal. Note that trib 26b ignores data 36 and *trailing sequence 38* as it was not requested for communication during *training sequence 34*.

At the end of *trailing sequence 38*, trib 26a transmits *training sequence 42 to initiate a communication session* with master transceiver 24. Because master transceiver 24 selected trib 26a for communication as part of *training sequence 34*, trib 26a is the only modem that will return a transmission. Thus, trib 26a transmits data 44 destined for master transceiver 24 followed by *trailing sequence 46 to terminate the communication session*.

> The foregoing procedure is repeated except master transceiver identifies trib 26b in *training sequence 48*. In this case, trib 26a ignores the *training sequence 48* and the subsequent transmission of data 52 and *trailing sequence 54* because it does not recognize its address in *training sequence 48*. Master transceiver 24 transmits data 52 to trib 26b followed by *trailing sequence 54* to terminate the communication session. Similarly, with reference to FIG. 8, sequence 172 illustrates a Type A modulation signal, with notification of a change[] to Type[] B, followed by a Type[] B modulation data signal. To send information back to master transceiver 24, trib 26b transmits *training sequence 56* to establish a communication session. Master transceiver 24 is conditioned to expect data only from trib 26b because trib 26b was selected as part of *training sequence 48*. Trib 26b transmits data 58 to master transceiver 24 terminated by *trailing sequence 62*.

'228 Patent at 4:3-5:7 (emphasis added).

> Referring now to FIG. 4, a multipoint communication system 100 is shown comprising a master transceiver 64 along with a plurality of tribs 66-66. In this example, two tribs 66a-66a run a type A modulation method while one trib 66b runs a type B modulation method. The present invention permits a secondary or embedded modulation method (e.g., type B) to replace the standard modulation method (e.g., type A) after an initial *training sequence*. This allows the master transceiver 64 to communicate seamlessly with tribs of varying types.
>
> * * *
>
> To switch from type A modulation to type B modulation, master transceiver 64 transmits a *training sequence 106* to type A tribs 66a in which these tribs are notified of an impending change to type B modulation. The switch to type B modulation could be limited according to a specific time interval or for the communication of a particular quantity of data. After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b. In an example, embedded modulation permits a secondary modulation to replace the usual primary modulation for a user data segment located after a primary training sequence. For example, master transceiver 64 may change to modulation Type B and may convey user information to type B trib 66b.

Id. at 6:4-13 & 6:27-44 (emphasis added).

> *To initiate a communication session* with a type A trib 66a, *master transceiver 64 transmits a training sequence 126* in which an address of a particular type A trib 66a is identified. The identified type A trib 66a recognizes its own address and transitions to state 128 to receive data from master transceiver 64 as part of sequence 132.

> After completing transmission sequence 132, which may include a user data segment transmitted using the usual primary (e.g., type A) modulation, master transceiver 64 transmits a *trailing sequence 134* using type A modulation signifying the *end of the current communication session*.

Id. at 7:11-21 (emphasis added). Contrary to Defendants' arguments, the specification does not establish that the sole purpose of a training signal, for example, must be to notify a trib that the trib will not understand the subsequent data transmission because that data is intended for a different trib. *See* Dkt. No. 102 at 21-22.

As to extrinsic evidence, Plaintiff has cited a dictionary definition of "header" as: "Identification or control information placed at the beginning of a file or message. *Contrast*: trailer." Dkt. No. 97, Ex. 3, *The IEEE Standard Dictionary of Electrical and Electronics Terms* 479 (1996). Plaintiff has also cited definitions of "trailer" as: "Identification or control information placed at the end of a file or message. *Contrast*: header"; and "The contiguous control bits following a transmission that contain information used for such purposes as bit error detection and end-of-transmission indication. *Contrast*: header." *Id.* at 1126.

The claims, specification, and extrinsic evidence are therefore all consistent with Plaintiff's proposal that a "training signal" marks the beginning of a communication session and a "trailing signal" marks the end of a communication session.

As to Defendants' proposals, Defendants have not argued that "training signal" and "trailing signal" are coined terms that the patentee defined in relation to what Defendants have argued is the sole purpose of the invention. To the extent that the specification discloses training and trailing signals that have destinations different from those of associated data transmissions, that capability is a feature of preferred embodiments and should not be imported into the claims. *See Comark*, 156 F.3d at 1187 ("[The specification] simply details how the video delay circuit is

to be used in a single embodiment of the invention."). The Court therefore rejects Defendants' argument that the "training signal" and "trailing signal" must be capable of having a different intended destination than an associated data transmission.

Similarly, as noted above, Defendants have relied upon items 106, 126, and 138 in Figure 5 to support their argument that the "training signal" and "trailing signal" must be "distinct" or "discrete" transmissions. Figure 5 is reproduced here:

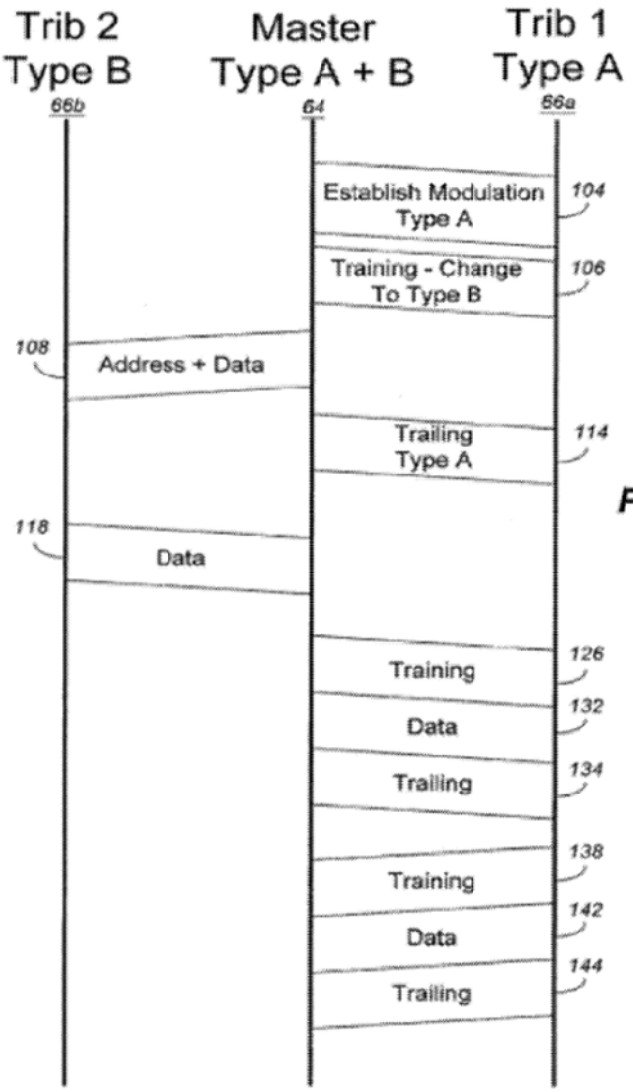

FIG. 5

Defendants have failed to demonstrate that this illustration of a preferred embodiment is limiting. *See MBO Labs.*, 474 F.3d at 1333 ("patent coverage is not necessarily limited to inventions that look like the ones in the figures"). Defendants' proposals in this regard are therefore rejected.

As to the proper constructions, Plaintiff's use of the word "signifies" is supported by the specification, particularly as to the term "trailing signal." *See* '228 Patent at 4:43-45 ("master transceiver 24 transmits data 36 to trib 26a followed by trailing sequence 38, which signifies the end of the communication session") & 7:19-21 ("master transceiver 64 transmits a trailing sequence 134 using type A modulation signifying the end of the current communication session"). The above-quoted disclosures demonstrate that a "training signal" should be construed in a similar manner.

Finally, at the May 30, 2014 hearing, Plaintiff had no objection to Defendants' proposal that a "training signal" must "establish[] properties of a subsequent data transmission."

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

Term	Construction
"training signal"	**"a transmission that signifies the beginning of a transmission sequence and determines one or more properties of the transmission sequence"**
"trailing signal"	**"a transmission that signifies the end of a transmission sequence"**

E. "signal level compensation"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"adjusting signal parameters in the receiver"[6]	"adjusting the amplitude characteristics of a receiver"

Dkt. No. 97 at 27; Dkt. No. 102 at 26. The parties submit that this term appears in Claim 31 of the '228 Patent. Dkt. No. 81, Ex. A at 19.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for this disputed term: "adjusting signal parameters in the receiver." Plaintiff had no opposition to the Court's preliminary construction. Defendants were opposed.

(1) The Parties' Positions

Plaintiff argues that "just as there are many different 'signal levels'—Defendants' dictionary acknowledges 'voltage, current, power, phase shift, or frequency,' to name a few—there are many different ways to compensate those signal levels. For example, the frequency or phase shift of a signal may be compensated independent of the signal's amplitude." Dkt. No. 97 at 28.

Defendants respond that "[t]echnical dictionaries [(quoted below)] define 'signal level' as the strength or power of a signal." Dkt. No. 102 at 26. Defendants argue that Plaintiff's proposed construction "fails to give meaning to the word 'level.'" *Id.* at 27. Defendants explain that "frequency represents the number of signal cycles in a given time period, and phase reflects the signal's position on the x-axis (time). These are not measures of the signal's 'level,' *i.e.*, its

[6] Plaintiff previously proposed: "adjusting signal parameters in the receiver to minimize receiving errors." Dkt. No. 81, Ex. A at 19.

strength or power." *Id.* Defendants argue that their multiple, unambiguous dictionary definitions outweigh Plaintiff's "lone and secondary definition." *Id.* at 28.

Plaintiff replies that the extrinsic dictionary definitions cited by the parties do not limit "signal level" to "amplitude." Dkt. No. 103 at 10.

At the May 30, 2014 hearing, Defendants acknowledged that frequency and phase are characteristics that may be said to have a "level," but Defendants maintained that a person of ordinary skill in the art at the relevant time would have understood "signal level" as referring to amplitude. Plaintiff responded that none of the evidence cited by Defendants refers to "amplitude." Defendants replied that they would have no objection to a construction that referred to "strength" instead of "amplitude." Defendants nonetheless reiterated that in no event should the disputed term encompass frequency or phase.

(2) Analysis

Claim 31 of the '228 Patent recites:

> 31. The master communication device as in claim 29, wherein the training signal establishes signal level compensation.

Claim 31 depends from Claim 29 and, in turn, Claim 26, but nothing in these claims informs the meaning of "signal level compensation." Likewise, the specification identifies "signal level compensation" as one of the uses of training signals (*see* '580 Patent at 3:53-56), but the specification does not otherwise discuss the term.

Plaintiff submits a technical dictionary definition of "compensation" as: "The controlling elements which compensate for, or offset, the undesirable characteristics of the process to be controlled in the system." *Id.*, Ex. 4, *Modern Dictionary of Electronics* 184 (6th ed. 1997). This aspect of the disputed term does not appear to be in dispute. Instead, the parties disagree on the scope of the term "signal level."

Plaintiff has cited a technical dictionary definition of "signal level" as: "The magnitude of a signal parameter or element, such as the magnitude of the electric field strength, voltage, current, power, phase shift, or frequency." Dkt. No. 97, Ex. 27, *Communications Standard Dictionary* 906 (3d ed. 1996). As Defendants have noted, however, that same dictionary alternatively defines "signal level" as: "A measure of the power of a signal at a specified point in a communications system." *Id.*

Defendants have also submitted additional dictionaries that define "signal level" in terms of power. Dkt. No. 102, Ex. 14, *Dictionary of Communications Technology* 401 (2d ed. 1995) ("The strength of a signal, generally expressed in either units of voltage or power."); *id.*, Ex. 15, *Newton's Telecom Dictionary* 544 (11th ed. 1996) ("The strength of a signal, generally expressed in either absolute units of voltage or power, or in units relative to the strength of the signal at its source."); *id.*, Ex. 16, *Dictionary of Telecommunications* 250 (1981) ("The magnitude of a signal at a point in a telecommunication circuit. This can be expressed as an absolute power level in decibels relative to one milliwatt (dBm).") (italics omitted).

In reply, Plaintiff has cited extrinsic articles that refer to signal "frequency level" and signal "phase level." Dkt. No. 103, Ex. 38, Hamid Nawab, et al., *Diagnosis Using the Formal Theory of a Signal-Processing System* 373 (1987); *id.*, Ex. 39, Marco Antonio Chamon & Gerard Salut, *Particle Filtering of Radar Signals for Non-Cooperating Target Imaging* 1041 (1998); *see id.*, Ex. 40, U.S. Pat. No. 3,953,798 at 3:56-63. Plaintiff argues these articles establish that frequency and phase can each have a "level."

These competing definitions and usages demonstrate why extrinsic sources must be considered with caution. *See Phillips*, 415 F.3d at 1321 ("[H]eavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the

artisan into the meaning of the term in the abstract, out of its particular context, which is the specification. * * * [T]here may be a disconnect between the patentee's responsibility to describe and claim his invention, and the dictionary editors' objective of aggregating all possible definitions for particular words."); *see also id.* at 1322 ("There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel.").

On balance, because the specification refers to "phase . . . modulation" as well as "amplitude modulation" (*see id.* at 2:5-6), the Court rejects Defendants' reliance on extrinsic evidence and accordingly rejects Defendants' proposal to limit the disputed term to amplitude. *See Phillips*, 415 F.3d at 1321.

The Court therefore hereby construes **"signal level compensation"** to mean **"adjusting signal parameters in the receiver."**

F. "a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary; plain and ordinary meaning applies.	"a first portion of the first communication indicating that the second modulation method will be used instead of the first modulation method for modulating the payload data in the payload portion of the first communication"

Dkt. No. 97 at 29; Dkt. No. 102 at 28. The parties submit that this term appears in Claim 22 of the '228 Patent. Dkt. No. 81, Ex. A at 21.

Shortly before the start of the May 30, 2014 hearing, the Court provided the parties with the following preliminary construction for this disputed term: "Plain meaning."

(1) The Parties' Positions

Plaintiff argues that "[t]he plain and ordinary meaning of the instant term is apparent on its face and from the context of the surrounding claim language." Dkt. No. 97 at 29. Plaintiff further argues that Defendants' proposed construction "inject[s] an 'instead of the first modulation method' limitation" that "is unnecessary, because it does not help to clarify or explain the meaning of the instant term." *Id.* at 30.

Defendants respond that "[t]he specification discloses a training signal that indicates a *change* to a different modulation method." Dkt. No. 102 at 28. Defendants argue: "Claim 22 therefore must be construed to require an indication of an impending *change* to a second modulation method (*i.e.*, that "the second modulation method will be used instead of the first modulation method"), not simply that a second modulation method will be used." *Id.* at 29. Defendants conclude that "[p]ermitting the claim to encompass a mere indication of the forthcoming modulation method, rather than a *change* to that method, would result in a failure of both the written description and enablement requirements under [35 U.S.C.] Section 112(a)." *Id.* at 30.

Plaintiff replies that "Defendants' construction adds unnecessary verbiage to an unambiguous claim." Dkt. No. 103 at 10.

At the May 30, 2014 hearing, Plaintiff acknowledged that the disputed term and the surrounding claim language require a change from one modulation method to another modulation method. Plaintiff maintained that because this is clear on the face of the claim, no construction is necessary. Plaintiff concluded that Defendants' proposed construction should be rejected as tending to introduce a new limitation or as otherwise confusing the meaning of the

claim. Defendants responded that clarification is warranted because the entire purpose of the purported invention is to notify and then to change modulation methods.

(2) Analysis

The Summary of the Invention refers to a "change in modulation":

> The present invention disclosed herein includes methods and systems for communication of data according to a communications method in which a master transceiver communicates with one or more slave transceivers according to a master/slave relationship.
>
> * * *
>
> The second message may comprise third information (e.g., first information of the second message/high data rate message), and the third information may be modulated according to the *first modulation method*. The third information may be indicative of an impending *change in modulation to a second modulation method* for transmission of fourth information (e.g., second information of the second message/high data rate message).

'228 Patent at 2:27-31 & 2:51-56 (emphasis added). The specification similarly discloses:

> To *switch from type A modulation to type B modulation*, master transceiver 64 transmits a training sequence 106 to type A tribs 66a in which these tribs are notified of an impending *change* to type B modulation. The *switch to type B modulation* could be limited according to a specific time interval or for the communication of a particular quantity of data. After notifying the type A tribs 66a of the change to type B modulation, master transceiver 64, using type B modulation, transmits data along with an address in sequence 108, which is destined for a particular type B trib 66b. In an example, embedded modulation permits a *secondary modulation to replace the usual primary modulation* for a user data segment located after a primary training sequence. For example, master transceiver 64 may *change* to modulation Type B and may convey user information to type B trib 66b. The type B trib 66b targeted by the master transceiver 64 will transition to state 112 as shown in FIG. 6 upon detecting its own address where it processes the data transmitted in sequence 108.

Id. at 6:27-44 (emphasis added); *see id.* at Figs. 5, 7 & 8 (illustrating "Change to Type B").

Claim 22 of the '228 Patent, which is the only claim that contains the disputed term, recites (emphasis added):

22. A communication device configured to communicate according to a master/slave relationship in which a slave communication from a slave to a master occurs in response to a master communication from the master to the slave, the device comprising:

a transceiver in the role of the master according to the master/slave relationship that is configured to send at least a plurality of communications, wherein each communication from among said plurality of communications comprises at least a respective *first portion* and a respective payload portion, wherein each communication from among said plurality of communications is addressed for an intended destination of the respective payload portion of that communication, and wherein *for each communication from among said plurality of communications*:

said respective *first portion is modulated according to a first modulation method* from among at least two types of modulation methods, wherein the at least two types of modulation methods comprise the first modulation method and a second modulation method, wherein the second modulation method is of a different type than the first modulation method,

said respective first portion comprises an indication of which of the first modulation method and the second modulation method is used for modulating respective payload data in the respective payload portion, and

the payload data is modulated according to at least one of the first modulation method or the second modulation method in accordance with what is indicated by the respective first portion;

the transceiver further configured to send at least a first communication of the plurality of communications such that payload data included in a payload portion of the first communication is modulated according to the second modulation method based on *a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication*, wherein the payload data is included in the first communication after the first portion of the first communication;

the transceiver further configured to send at least a second communication of the plurality of communications such that payload data included in a payload portion of the second communication is modulated according to the first modulation method based on a first portion of the second communication indicating that the first modulation method will be used for modulating the payload data in the payload portion of the second communication.

On balance, the recital that the "first portion is modulated according to a first modulation method"—coupled with the recital in the disputed term that "the second modulation method will

be used for modulating the payload data in the payload portion of the first communication"—is clear on its face.

Further, as noted above, Plaintiff has agreed that the disputed term and the surrounding claim language require a change from one modulation method to another modulation method.

Defendants' proposed clarification is therefore unnecessary and would tend to confuse rather than clarify the scope of the claim. *See U.S. Surgical*, 103 F.3d at 1568 ("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*, 521 F.3d at 1362 ("[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.").

The Court accordingly hereby expressly rejects Defendants' proposed construction and hereby construes **"a first portion of the first communication indicating that the second modulation method will be used for modulating the payload data in the payload portion of the first communication"** to have its **plain meaning**.

CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-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 10th day of July, 2014.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE