IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

BRANDYWINE COMMUNICATIONS TECHNOLOGIES, LLC,

Plaintiff,

v.

AT&T CORP., et al.,

Defendants.
/

No. C 12-2494 CW

ORDER CONSTRUING CLAIMS; GRANTING MOTION FOR LEAVE TO AMEND INFRINGEMENT CONTENTIONS; DENYING MOTION TO STRIKE INFRINGMENT CONTENTIONS (Docket Nos. 68, 128, 149)

Plaintiff Brandywine Communications Technologies, LLC brought this action against Defendants AT&T Corporation and SBC Internet Services, Inc. for patent infringement. The parties dispute the meaning of sixteen claim terms in five of Brandywine's patents: U.S. Patent Nos. 5,251,328 ('328 patent), 5,812,537 ('537 patent), 6,970,501 ('501 patent), 7,894,472 ('472 patent), and 5,828,657 ('657 patent).[1] After considering the parties' submissions and oral argument, the Court construes the disputed terms as set forth below. In addition, the Court grants Brandywine's motion for leave to amend its infringement contentions and denies Defendants' motion to strike.

BACKGROUND

This case is one of over forty lawsuits that Brandywine has filed around the country over the past two years alleging "infringement of six patents that generally relate to networking protocols, techniques, and systems for use in the provision of

[1] The parties represent that they do not dispute the meaning of any claims in the sixth patent in suit, U.S. Patent No. 5,206,854.

Internet connectivity via digital subscriber line (DSL) technology." In re Brandywine Commc'ns Techs., LLC, Patent Litig., 959 F. Supp. 2d 1377, 1378 (J.P.M.L. 2013). Most of these actions have been voluntarily dismissed pursuant to settlement agreements. Id. As a result, this is only the second of these cases to reach the claim construction stage. The first claim construction order regarding these patents was issued by a court in the Middle District of Florida in April 2013. Brandywine Commc'ns Technologies, LLC v. CenturyTel Broadband Servs., LLC, Civil Case No. 12-0286, Docket No. 96 (M.D. Fla. April 17, 2013) (CenturyTel).[2]

The parties in this action originally filed their motions for claim construction in April and May 2013. While those motions were pending, however, Brandywine filed a motion for centralization of its various patent infringement actions with the Judicial Panel on Multidistrict Litigation. In light of that motion, this Court vacated the scheduled claim construction hearing and stayed the present action pending a decision by the Panel on whether to centralize these cases. In August 2013, the Panel denied Brandywine's motion. It noted that Brandywine's various actions were "being litigated in a manner that is likely to lead to their resolution, whether through settlement or other means, within a relatively short period of time" and thus concluded that "centralization of this litigation might hinder the orderly and efficient resolution of these cases." In re

[2] Brandywine has submitted a copy of the CenturyTel court's unpublished claim construction order as Exhibit F to the Declaration of Lei Sun. See Docket No. 68-7.

Brandywine Commc'ns Techs., LLC, Patent Litig., 959 F. Supp. 2d at 1378. This Court lifted the stay and heard the parties' motions for claim construction in September 2013.

Four months later, in January 2014, Brandywine served Defendants with supplemental infringement contentions. Defendants promptly moved to strike those supplemental infringement contentions on the grounds that Brandywine had failed to obtain leave of the Court, as required by this Court's Local Rules. Brandywine moved for leave to amend its infringement contentions shortly thereafter.

DISCUSSION

I. Claim Construction

A. Legal Standard

The construction of a patent is a matter of law for the Court. Markman v. Westview Instruments, Inc., 517 U.S. 370, 372 (1996). "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)). Accordingly, in construing disputed terms, the Court first looks to the words of the claims. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996). Generally, the court ascribes the words of a claim their ordinary and customary meaning. Id. The Federal Circuit instructs that "the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the

effective filing date of the patent application." Phillips, 415 F.3d at 1313. Other claims of the patent in question can also assist in determining the meaning of a claim term. Id. at 1314. "Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims." Id.

The Federal Circuit also instructs that claims "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)). The specification must contain a description of the invention that is clear and complete enough to enable those of ordinary skill in the art to make and use it, and thus the specification is "always highly relevant" to the Court's claim construction analysis. Vitronics, 90 F.3d at 1582. "Usually, [the specification] is dispositive; it is the single best guide to the meaning of a disputed term." Id. In some cases, the specification may reveal that the patentee has given a special definition to a claim term that differs from its ordinary meaning; in such cases, "the inventor's lexicography controls." Phillips, 415 F.3d at 1316. The specification also may reveal the patentee's intentional disclaimer or disavowal of claim scope. "In that instance as well, the inventor has dictated the correct claim scope, and the inventor's intention, as expressed in the specification, is regarded as dispositive." Id. However, claims are not limited to the preferred embodiment described in the specification. See SRI Int'l v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc; plurality opinion).

While emphasizing the importance of intrinsic evidence in claim construction, the Federal Circuit has authorized courts to rely on extrinsic evidence, which consists of "all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." Phillips, 415 F.3d at 1317 (quoting Markman, 52 F.3d at 980). While extrinsic evidence may be useful to the Court, it is less significant than intrinsic evidence in determining the legally operative meaning of claim language. Phillips, 415 F.3d at 1317-18; see also C.R. Bard, Inc. v. U.S. Surgical Corp., 388 F.3d 858, 862 (Fed. Cir. 2004). Furthermore, extrinsic evidence is unlikely to lead to a reliable interpretation of claim language unless considered in the context of the intrinsic evidence. Phillips, 415 F.3d at 1319.

B. '328 Patent

When a signal is transmitted through a communications channel, its waveform or amplitude may be altered during the transmission process. Undesirable alterations are typically known as "distortions." See generally Microsoft Computer Dictionary 146 (4th ed. 1999) (defining a "distortion" as the "undesirable change in the waveform of a signal"). The '328 patent discloses "a technique for compensating for distortion introduced in a portion of a communications channel." '328 patent col. 1:7-:10.

The parties dispute four of the '328 patent's claim terms. Claim 2 illustrates the patent's usage of two of these terms, both of which are highlighted in bold below:

> A method for use in a transceiver of a communications system wherein a communications channel through which a

> signal is transmitted introduces amplitude distortion, said method comprising the steps of
>
> **determining** less than all of the amplitude distortion introduced within said communications channel in response to a signal received from said communications channel using apparatus [sic] designed to determine less than all of the amplitude distortion introduced within said communications channel; and
>
> **predistorting a transmitted signal from said transceiver** in response to said determined amplitude distortion.

'328 patent col. 6:6-:18.

Claim 15 illustrates how the other two disputed terms are used:

> A method for use in a communications system wherein a signal is transmitted from a transmitter through a communications channel to a receiver, said **communications channel including a plurality of serially connected channel sections which introduce amplitude distortion into a transmitted signal** including the **section** adjacent said receiver, said method comprising the steps of
>
> receiving a training sequence including at least one a priori known signal and
>
> determining the amplitude distortion introduced only in the communications channel **section** adjacent said receiver in response to said received training sequence.

'328 patent col. 7:8-:21. The disputed terms appear in claims 2, 3, 15, and 21 of the patent.

1. "Communications Channel Including a Plurality of Serially Connected Channel Sections Which Introduce Amplitude Distortion into a Transmitted Signal" (Claims 3, 15)[3]

The parties dispute whether every section of the "communications channel" described in this term must introduce distortion into the transmitted signal. Defendants argue that every "section" of the communications channel must introduce distortion because the subject of the verb "introduce" appears to be "sections" rather than "plurality." Brandywine, in contrast, argues that the term may describe any communications channel in which "at least one" section introduces distortion. The CenturyTel court adopted Defendants' proposed construction. Sun Decl., Ex. F, April 2013 CenturyTel Order, at 14 (holding that "the grammatical construction of the sentence forecloses the possibility that just one channel section can introduce amplitude distortion").

The Court finds that Defendants' proposed construction is overly restrictive because it effectively construes the word "plurality" to mean "all" rather than simply "a large number," which is its ordinary meaning. See Webster's Third New International Dictionary 1745 (Philip Babcok Gove ed. 1993). Even assuming that "sections" is the intended subject of "introduce," as Defendants contend,[4] the number of "sections" that introduce distortion is still constrained by the word "plurality."

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[3] The term, "sections," as it is used in this and other claims from the '328 patent, is construed separately below.

[4] While Defendants are correct that "plurality" is a singular noun -- and, as such, cannot correctly be the subject of "introduce" -- native English writers frequently treat collective nouns like "plurality" as though they are plural. See Valerie Krishna, "The Syntax of Error," 1 J. Basic Writing 43, 44 (1975) (observing that collective nouns are a common source of grammatical error).

The Court therefore adopts Brandywine's proposed construction for this claim term, which reads as follows: "communications channel including a plurality of serially connected channel sections, at least one of which introduces amplitude distortion into a transmitted signal."

2. "Determining" claims (Claims 2, 15, 21)

The '328 patent specification discloses a method for "determining the distortion introduced within a portion of a communications channel" and then using that determination "to predistort the signal transmitted by that transceiver to compensate for all or a part of the determined amplitude distortion." '328 patent col. 2:9-:15. Three of the patent's claims use the term "determining" to describe the first part of this process, during which the level of amplitude distortion is initially determined.

The parties dispute whether the "determining" steps can be performed by analyzing a signal that has traveled through only part of the communications channel, rather than the entire channel. Defendants contend that the signal must travel through the entire channel. They note that a preferred embodiment of the invention described in the specification requires both the transmission and receipt of "known signals" (sometimes called a "training sequence") through a given communications channel in order to determine the level of amplitude distortion introduced by that communications channel. Id. col. 2:17-:20. Defendants argue that this description shows that the "determining" steps require an examination of a "training sequence" that has been transmitted through the entire communications channel. Two of the disputed

claims, however, do not contain this limitation and Defendants have not identified anything in the prosecution history to suggest that the "determining" steps should be construed so narrowly. Moreover, several of the patent's other claims disclose a specific apparatus that uses a "training sequence" to determine the amplitude distortion. See id. col. 8:14-:25. This suggests that the "determining" steps in the three disputed claims -- two of which do not refer specifically to any "training sequence" -- were not meant to be construed as narrowly as Defendants suggest.[5]

Thus, because Defendants' proposed limitation is based on a preferred embodiment of the invention, their argument that the "determining" claims require a known signal to traverse the entire communications channel must be rejected. See SRI Int'l v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc; plurality opinion) (recognizing that preferred embodiments in the specification should not be used to limit claim language). The CenturyTel court likewise rejected this argument in its claim construction order. See CenturyTel Order 14-17.

The Court therefore adopts the following constructions of the "determining" terms in claims 2, 15, and 21.[6]

[5] Defendants note that Brandywine misapplied the doctrine of claim differentiation when it raised this argument in its opening brief because claim 19 is not dependent on any of the specific claims in dispute here. Even if the doctrine is inapplicable here, however, the underlying logic of Brandywine's argument remains correct: the inventor's use of a more specific term -- "training sequence" -- in the undisputed claims suggests that he deliberately omitted that term from the disputed claims.

[6] The Court rejects the alternative constructions proposed by Defendants in their supplemental post-hearing brief because all of their alternative constructions use a grammatical structure that is likely to cause confusion.

Claim 2: "determining less than all of the amplitude distortion introduced within said communications channel in response to a signal received from said communications channel" is construed as "determining less than all of the amplitude distortion introduced within said communications channel in response to a signal which was received from said communications channel and traveled through all or part of that communications channel."

Claim 15: "determining the amplitude distortion introduced only in the communications channel section adjacent said receiver in response to said received training sequence" is construed as "determining the amplitude distortion introduced only in the communications channel section adjacent said receiver in response to said received training sequence, which traveled through all or part of that communications channel."

Claim 21: "determining the amplitude distortion introduced within only one of said communications channel sections in response to a signal received from said communications channel" is construed as "determining the amplitude distortion introduced within only one of said communications channel sections in response to a signal which was received from said communications channel and traveled through all or part of that communications channel."

3. "Predistorting a Transmitted Signal from Said Transceiver" (Claims 2, 21)

The parties' disagreement concerning the meaning of the "predistorting" terms has two parts. First, they dispute whether the "predistorting" step disclosed in claims 2 and 21 requires

that the predistortion be based on the "inverse of the amplitude distortion." Defs.' Claim Constr. Brief 23. Second, they dispute whether the "predistorting" steps in these claims must be performed by the same transceiver that performs the "determining" steps discussed above.

Regarding the first dispute, Defendants argue that the specification expressly requires that the "predistorting" steps be based on an "inverse of the amplitude distortion." For support, they cite language from the specification which states, "In certain system applications, it is desirable to predistort the transmitted signal from transceiver 102 based on the exact inverse of the determined distortion characteristic." '328 patent col. 5:1-:18 (emphasis added). Defendants' reliance on this sentence is misplaced, however, because the sentence's prefatory clause -- "In certain applications" -- makes clear that it is only describing a preferred embodiment of the invention. Id. (emphasis added). The claims themselves do not incorporate Defendants' proposed limitation into the "predistorting" steps. The CenturyTel court reached the same conclusion. CenturyTel Order 11-13.

Regarding the parties' second dispute, the Court finds that the "determining" and "predistorting" steps must both be performed by the same transceiver. The language of claim 2 supports this construction because it refers only to one transceiver. Claim 2 discloses a "method for use in a transceiver" for "determining less than all of the amplitude distortion introduced" by a given communications channel. '328 patent col. 6:6-:11 (emphasis added). The same claim discloses a method for "predistorting a

transmitted signal from said transceiver in response to said determined amplitude distortion." Id. col. 6:16-:18 (emphasis added). This suggests that the two steps are performed by a single transceiver.

This interpretation is consistent with the specification's "Summary of the Invention," which states,

> the present invention covers the notion of determining the distortion introduced within a portion of a communications channel between two signal transceivers by processing the received signal at a transceiver and then using the results of this processing to predistort the signal transmitted by that transceiver to compensate for all or a part of the determined amplitude distortion.

Id. col. 2:8-:15 (emphasis added). This language indicates that the "predistorting" step is performed by the same transceiver that performs the "determining" step. Although the CenturyTel court reached a different conclusion, it did not explain its reasoning.

The Court therefore adopts the following construction, which omits Defendants' proposed limitation and makes clear that the "predistorting" and "determining" steps are performed by the same transceiver: "adjusting a signal, to be transmitted from the same transceiver that determined the amplitude distortion, to compensate for amplitude distortion before the introduction of the amplitude distortion."

4. "Section(s)" (Claims 15, 21)

The parties dispute whether the term "section(s)" should be construed as "subscriber loops," as Defendants contend, or given its plain and ordinary meaning, as Brandywine contends. The CenturyTel court did not discuss this term in its claim construction order.

Because the patent claims clearly distinguish between "section(s)" and "subscriber loops," Defendants' proposed construction must be rejected. Claim 6 of the patent refers specifically to a communications channel that "includes two subscriber loops and the communications channel section adjacent said apparatus is a subscriber loop." '328 patent col. 6:44-:46. If "section" were construed to mean "subscriber loop," as Defendants have proposed, then this claim language would be redundant.

The Court therefore finds that this term should be construed according to its plain and ordinary meaning.

C. '537 Patent

When a signal is transmitted over a communications channel, an unwanted "echo" of that signal is sometimes transmitted back to the sender. The '537 patent discloses an "echo canceling method and apparatus" intended to reduce these unwanted signals. '537 patent col 1:66. The parties agree that the term "echo," as it is used in this patent and the '657 patent, means "a reflected signal that is transmitted by one receiver, reflected by something on the transmission line, and then received by the same transceiver."

The parties dispute four of the '537 patent's claim terms. All four of these terms appear in claim 1 of the patent, which reads as follows:

> Data communications equipment apparatus comprising:
> an echo canceler for processing an echo-corrupted signal to provide an echo-canceled signal, wherein the echo canceler has a set of tap coefficients, each tap coefficient having an initial value determined during a half-duplex portion of a training sequence;

> circuitry for detecting the presence of a **residual echo** signal in the echo-canceled signal during full-duplex transmission that is subsequent to said half-duplex portion of the training sequence; and
>
> a processor, coupled to the circuitry, **for adjusting each initial value of each tap coefficient by a fixed amount** when the detected **residual echo** signal during full duplex transmission is greater than a **predetermined amount**.

'537 patent col. 7:40-:55. The disputed claim terms also appear in claims 2, 6, 7, 12, 13, and 19.

1. "Fixed Amount" (Claims 1, 6, 12, 19)

Defendants contend that this term should be construed as "predefined, non-variable amount." Brandywine, in contrast, contends that it should be given its plain and ordinary meaning.

The Court finds that this term should be given its plain and ordinary meaning because, as the CenturyTel court explained, the term "does not have a technical meaning that would cause jury confusion." CenturyTel Order 18; see also Phillips, 415 F.3d at 1314 ("In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.").

2. "Predetermined Amount" (Claims 1, 19)

Defendants contend that this term should be construed as "threshold error level determined before training to indicate incorrect training." Brandywine asserts that it should be given its plain and ordinary meaning. The CenturyTel court did not discuss this term in its claim construction order.

Because this term does not have a technical meaning that is likely to cause confusion, the Court finds that this term should be construed according to its plain and ordinary meaning. Phillips, 415 F.3d at 1314.

3. "Residual Echo" (Claims 1, 2, 6, 7, 12, 13)

Defendants contend that the term should be construed as "uncanceled echo resulting from a non-linear condition during half-duplex training not present during full-duplex training" while Brandywine contends that it should be construed as "portion of an echo that remains after filtering."[7] The CenturyTel court did not discuss this term in its claim construction order.

Defendants' proposed construction would improperly limit the meaning of the disputed term by requiring that the residual echo result from "a non-linear condition." Defendants have not offered any compelling reasons to impose such a limitation here. Furthermore, Defendants' proposed construction would add confusing and redundant language to the disputed claims by attempting to describe the residual echo's relationship to the training sequences. The disputed claims already contain similar language. See, e.g., '328 patent col. 7:47-:50 (claiming "circuitry for detecting the presence of a residual echo signal in the echo-canceled signal during full-duplex transmission that is subsequent to said half-duplex portion of the training sequence"). Thus,

[7] Brandywine originally proposed that this term be construed according to its plain and ordinary meaning. At the hearing, however, the Court noted that many jurors would not be familiar with the plain and ordinary meaning of "residual echo" and directed the parties to propose an alternative construction for this term. Brandywine thus proposed a new construction in a supplemental brief that it submitted jointly with Defendants after the hearing. The Court considers Brandywine's alternative proposed construction here.

because Defendants' proposed construction is unjustifiably narrow and likely to confuse the jury, it must be rejected.

Brandywine's proposed construction, unlike Defendants', does not impose any improper limitations on the scope of the disputed term. It still has the potential to cause confusion, however, because it uses the word "filtering," which does not appear in any of the patent's other claims. To address this problem, the Court adopts a modified version of Brandywine's proposal and construes the disputed term as follows: "portion of an echo that remains after an echo-cancelation process."

4. "Adjusting the Initial Value of (Each One of the Set of) Tap Coefficient (of the Echo Canceler) by a Fixed Amount" (Claims 1, 12, 15, 19, 22)

Defendants contend that the "adjusting" process described in these claims is "distinct from the continued adaptation of the echo canceler." Defs.' Claim Constr. Resp. 31. Brandywine argues that this construction improperly limits the scope of the disputed term. The CenturyTel court agreed with Brandywine and found that this term should be construed according to its plain and ordinary meaning. CenturyTel Order 19 (citing Finjan, Inc. v. Secure Computing Corp., 626 F.3d 1197, 1207 (Fed. Cir. 2010)).

This Court rejects Defendants' proposed construction for the same reasons as the CenturyTel court. The Federal Circuit has cautioned against narrowing the scope of a claim when the "additional negative limitation finds no anchor in the explicit claim language." Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1322 (Fed. Cir. 2003). A court, therefore, should not add a negative limitation to a claim unless it finds an "express disclaimer or independent lexicography in the written description

[of the invention] that would justify adding that negative limitation." Id. at 1323. Defendants have not identified any such justification here. Instead, they point to a sentence in the specification stating that the process of adaptive adjustment is costly and difficult to implement. See '537 patent col. 3:16-:20 ("Full-duplex training of the echo canceler, while theoretically possible, is not practical from a price/performance viewpoint in the design of data communications equipment."). This broad language does not rise to the level of an "express disclaimer" and therefore does not support the limitation Defendants seek to impose. Indeed, this limitation would conflict with other language in the patent specification suggesting that the invention is capable of adaptive adjustment. See id. col. 7:33-:36 ("[T]he inventive concept is also applicable to an echo canceler that adapts in the data phase, since, typically, the echo canceler adapts too slowly to the changes in the echo signal."). Thus, Defendants' proposed construction must be rejected.

The Court finds that this term should be construed according to its plain and ordinary meaning. To facilitate the jury's understanding of the plain and ordinary meaning of this term, however, the Court adopts the parties' agreed upon definition of "tap coefficients": "settings that define the operating characteristics of the echo canceler."

D. '657 Patent

Like the '537 patent, the '657 patent also relates to echo cancellation technology. The parties dispute only one claim term from this patent: namely, "pilot signal," which appears in claims

1, 3, 4, 5, and 6. Claim 1 illustrates how the term is used in the patent:

> Data communications equipment apparatus comprising:
> an echo canceler that is trained during an echo-canceler training phase of a half duplex training sequence with a far-end data communications equipment while the communication channel is operating in a linear mode; and
> a filter that filters a received signal during the echo-canceler training phase to remove a **pilot signal** transmitted by the far-end data communications equipment before application of the received signal to the echo canceler to train the echo canceler on an echo signal component thereof.

'657 patent col. 8:8-:21.

The parties here dispute whether this "pilot signal"[8] must cause "linear operation of the communications channel." Defs.' Claim Const. Brief 16. Defendants contend that this limitation is required by the specification, which states, "This pilot tone is of a high enough signal level to cause the above-mentioned compander to achieve its linear range." '657 patent col. 2:7-:9. Brandywine argues that the term should be construed as "a signal wave transmitted over the system to indicate control or its characteristics." The CenturyTel court rejected Defendants' proposed construction, finding that Brandywine's proposed

[8] According to the General Service Administration's (GSA) Glossary of Telecommunications Terms, a pilot signal is a "signal, usually a single frequency, transmitted over a communications system for supervisory, control, equalization, continuity, synchronization, or reference purposes." GSA, Telecommunications: Glossary of Telecommunications Terms (1996), http://www.its.bldrdoc.gov/fs-1037/fs-1037c.htm (last visited April 14, 2014, 4:00 p.m.). Federal courts routinely use the GSA Glossary to aid in their construction of patents issued in the telecommunications field. See, e.g., Northpoint Tech., Ltd. v. MDS Am., Inc., 413 F.3d 1301, 1316 (Fed. Cir. 2005) (citing glossary for claim construction purposes).

construction was closer to the term's plain and ordinary meaning. See CenturyTel Order 19-21.

This Court likewise rejects Defendants' proposed construction. The "pilot tone" description that Defendants cite for support applies only to an embodiment of the invention which is designed specifically to address situations where the compander is "not linear in the signal range of the returned far-end echo signal during the half-duplex training phase." Id. col. 4:3-:4. While the pilot signal might cause "linear operation of the communication channel" in this embodiment, the claims do not require that it does so in every embodiment of the invention. Accordingly, Defendants' proposed construction is too narrow and must be rejected.

The Court therefore adopts the following construction of "pilot signal," which is a modified version of Brandywine's proposed construction: "a signal transmitted over the system for control or reference purposes."

E. '501 Patent

When multiple communications providers share a common communication channel -- for instance, when two telephone companies share a single telephone wire -- those providers typically use different ranges of the frequency spectrum to avoid interfering with each other's transmissions. '501 patent col. 1:23-:41. The process by which such providers select and use different frequency ranges is known as "spectrum management." The '501 patent relates generally to "spectrum management" technology. Id.

The parties dispute four of the '501 patent's claim terms. Three of these disputed terms appear in claim 1 of the patent, which reads as follows:

> An apparatus comprising:
> a modem connected to a subscriber loop, the modem being capable of operating in one or more modes that are compatible with one or more **spectrum management classes** defined by a standard, each spectrum management class defining power spectral density (PSD) requirements, the modem being configured to automatically select a mode that is compatible with at least one of the **spectrum management classes**;
> a **plurality of transceivers**, each transceiver corresponding to one of the modes, wherein the modem electrically couples a corresponding transceiver to the subscriber loop upon selecting one of the modes;
> a selector, the selector selecting one of the transceivers to be electrically coupled to the subscriber loop; and
> an **Automatic Class Measurement device** in communication with the selector, the Automatic Class Measurement device being configured to automatically select a mode that is compatible with at least one of the **spectrum management classes** and to cause the selector to select one of the transceivers to be electrically coupled to the subscriber loop.

'501 patent col. 11:65-12:18.

The fourth disputed claim term appears in claim 12, which is quoted and discussed below. Every claim of the '501 patent contains one or more disputed terms.

1. "A Plurality of Transceivers (Each Transceiver Corresponding to One of the Modes)" (Claims 1, 5, 12)

Brandywine contends that the phrase "a plurality of transceivers," as it is used in this term, means "two or more

hardware and/or software transceivers."[9] Defendants argue that "plurality of transceivers" means "two or more hardware transceivers." The CenturyTel court adopted Defendants' proposed construction because it found that a "transceiver" is a piece of physical hardware. CenturyTel Order 6-7 ("The Court is unwilling to read additional possibilities into the claim language that negate the clear language and intent of the claim."). This Court similarly concludes that a "plurality of transceivers" means "two or more hardware transceivers."

Brandywine contends that the CenturyTel court's reasoning is flawed because its construction was based on a dictionary definition of "transceiver," rather than intrinsic evidence in the patent and the prosecution history. See id. at 7 (citing Harry Newton, Newton's Telecom Dictionary (11th ed. 1996)). The CenturyTel court's reliance on the dictionary definition, however, was entirely proper because it relied on the definition for a limited purpose -- namely, to determine whether a transceiver constituted a "physical device" -- and the definition it cited did not conflict with any intrinsic evidence. Vitronics Corp., 90 F.3d at 1584 n.6 ("Judges are free to consult [extrinsic evidence] at any time in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents."). The CenturyTel court also noted that,

[9] After the claim construction hearing, Brandywine revised its proposed construction of this term. Its revised proposal must be rejected for the same reasons that its original proposal must be rejected.

at the hearing in that case, "Plaintiff appeared to concede . . . that a transceiver is a physical device." CenturyTel Order 7 n.3.

Accordingly, the Court adopts Defendants' proposed construction of the disputed term: "two or more hardware transceivers available for connection, one at a time, to the subscriber line."[10]

2. "Automatic Class Measurement Device" (Claims 1, 5, 12)

This term refers to a device that is part of a larger apparatus claimed by the '501 patent. The parties dispute the scope of the device's capabilities. Brandywine asserts that the device is "capable of performing tests to determine which transceiver should be connected to a subscriber line." Pl.'s Claim Constr. Brief 23. Defendants contend that the device is merely capable of "identifying allowable spectrum management classes based on line tests." Defs.' Claim Constr. Brief 6. The CenturyTel court did not discuss this term in its claim construction order.

The plain language of the disputed claims illustrates that Brandywine's proposed construction is overbroad. Claims 1, 5, and 12 all expressly state that the "Automatic Class Measurement device" is "configured to automatically select a mode that is compatible with at least one of the spectrum management classes." '501 patent col. 12:16-:17, 12:55-:58, 14:16-:19 (emphasis added). In light of this language, Brandywine's proposed construction,

[10] Both parties agreed to the second part of this construction, beginning with the word "available."

which omits any reference to "spectrum management classes," must be rejected.

Similarly, Defendants' proposal to add the limitation, "based on line tests," to this term must also be rejected. Neither the patent claims nor the specification requires that the "Automatic Class Measurement device" rely exclusively on "line tests" to identify spectrum management classes or select an appropriate mode.

The Court therefore adopts the following construction of this term: "a device capable of identifying allowable spectrum management classes to determine which transceiver should be connected to a subscriber line."

3. "Spectrum Management Classes (Defined by a Standard)" (Claims 1-13)

The parties dispute whether or not the term "spectrum management classes" is indefinite. Defendants contend that the term is indefinite because, when the '501 patent was issued, the Federal Communications Commission (FCC) had not yet finalized its "deployment rules for identifying the available Spectrum Management Class or Classes." '501 patent col. 6:31-:32. Further, the patent itself acknowledges that these rules "even once finalized, are always subject to change." Id. col. 6:32-:33. Thus, Defendants argue, because these spectrum management rules lacked a stable and unchanging definition at the time the patent was issued, the claims that refer to "spectrum management classes" must be found indefinite. The CenturyTel court rejected this argument and found that this term was not indefinite. CenturyTel Order 4-6.

The Federal Circuit has held that claims should only be deemed indefinite if they are "insolubly ambiguous, and no narrowing construction can properly be adopted." Exxon Research & Engineering Co. v. United States, 265 F.3d 1371, 1375 (Fed. Cir. 2001). At the same time, "courts may not redraft claims, whether to make them operable or to sustain their validity." Chef Am., Inc. v. Lamb-Weston, Inc., 358 F.3d 1371, 1374 (Fed. Cir. 2004).

Here, the claims that use the term "spectrum management classes" are not indefinite. The specification expressly outlines the purpose of these spectrum management classes, noting that they would be defined by a set of standards designed to "minimiz[e] the potential for cross-talk interference in twisted pair subscriber loop cables that are shared by multiple service providers." '501 patent col. 1:31-:34. The specification further explains that these standards would be based on criteria such as "(1) transmit signal power spectral density (PSD) requirements, (2) transmit signal average power requirements, (3) transverse balance requirements, (4) deployment restrictions based upon the subscriber loop characteristics, and (5) loop assignment guidelines." Id. col. 1:42-:47. This discussion of "spectrum management classes" is sufficient to illustrate the term's meaning to a person of ordinary skill in the art.

While Defendants note that the FCC's specific spectrum management standards are subject to change, this variability in the official standards does not render the patent claims indefinite. By way of analogy, the claims of a radar-gun patent would not be considered indefinite merely because they refer to state speed limits that are subject to change. As noted above,

the '501 patent identifies a clear set of measurable criteria on which the "spectrum management classes" are based and the claimed invention purports to have the capacity to distinguish among those classes. Thus, as long as the "spectrum management classes" are based on the same criteria identified in the patent, the claims referring to "spectrum management classes" are sufficiently definite.

Defendants' efforts to analogize this case to Datamize, LLC v. Plumtree Software, Inc., 417 F.3d 1342 (Fed. Cir. 2005), are not persuasive. In Datamize, the Federal Circuit held that the term "aesthetically pleasing" was indefinite because aesthetic value is not measurable. Id. at 1347. Here, in contrast, the '501 patent identifies a specific set of measurable criteria, outlined above, incorporated into the term "spectrum management classes."

Accordingly, the Court rejects Defendants' argument that "spectrum management classes" is indefinite and adopts the following construction of this term, which Brandywine proposed in the parties' post-hearing brief: "requirements for data transmission equipment designed to minimize interference with other nearby data transmitters."

4. "The Modem Electrically Couples" (Claim 12)

The parties dispute whether this term renders claim 12 of the patent indefinite. Claim 12 reads, in relevant part, as follows:

> A system for communicating over a subscriber loop, the system comprising:
> a first modem located at a subscriber premise, the first modem being capable of operating in one or more modes that are compatible with one or more spectrum management classes defined by a standard, each

> spectrum management class defining power spectral density (PSD) requirements;
> a second modem located at a central office, the second modem being capable of operating in one or more modes that are compatible with one or more of the spectrum management classes;
> a subscriber loop electrically coupling the first modem to the second modem wherein the first and second modems cooperate with each other to determine which of the spectrum management classes are compatible with the subscriber loop;
> a plurality of transceivers, each transceiver corresponding to one of the compatible modes, wherein **the modem electrically couples** a corresponding transceiver to the subscriber loop upon selecting one of the modes; . . . .

'501 patent col. 13:25-14:14. Defendants contend that this claim is indefinite because it fails to identify whether the term "the modem electrically couples" refers to the first or second modem mentioned in this claim. The CenturyTel court agreed and concluded that "the meaning of this term is not ascertainable by one of ordinary skill in the art and is thus indefinite." CenturyTel Order 9.

As noted above, claims should only be deemed indefinite if they are "insolubly ambiguous." Exxon Research & Engineering Co., 265 F.3d at 1375. Brandywine contends that the disputed claim is not "insolubly ambiguous" because it can simply be construed to refer to each of the two modems mentioned earlier in the claim. For support, it points to language from the prosecution history suggesting that claim 12 -- which combined three previously asserted claims -- was supposed to contain a preamble that read: "The system of [another claim], wherein each of the first and second modems further comprises . . . ." Sun Decl., Ex. T, March 2004 Claim Amendments, at 8. According to Brandywine, the patent

applicant "left off the preamble" in the process of amending these claims. Pl.'s Claim Constr. Brief 28. Brandywine notes that the CenturyTel court did not have the benefit of this aspect of the prosecution history when it issued its claim construction order.

Brandywine's analysis of the prosecution history does not support its proposed construction because it does not explain why the preamble was omitted and why it should now be read back into the claim. Brandywine does not assert, for instance, that the preamble was omitted due to error by the U.S. Patent and Trademark Office (PTO). See, e.g., Novo Indus., L.P. v. Micro Molds Corp., 350 F.3d 1348, 1354 (Fed. Cir. 2003) (holding that, in certain circumstances, a "district court can act to correct an error in a patent by interpretation of the patent where no certificate of correction has been issued"). Further, even if Brandywine had made such an allegation, this Court would only be permitted to correct the error if it was "evident from the face of the patent." Group One, Ltd. v. Hallmark Cards, Inc., 407 F.3d 1297, 1303 (Fed. Cir. 2005). Here, it is not evident from the face of the patent that claim 12 is missing the omitted preamble that Defendants cite; claim 12 has a preamble. Because it would be improper to reincorporate that language into the claim, the Court finds that claim 12 is indefinite.

Although Brandywine asserts that it is premature to rule on indefiniteness at the claim construction stage, the Federal Circuit has made clear that indefiniteness is a legal question that district courts may decide prior to trial. Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 705 (Fed. Cir. 1998) ("A determination of claim indefiniteness is a legal

conclusion that is drawn from the court's performance of its duty as the construer of patent claims."). Other courts in this district have recognized that "it is appropriate for [district courts] to address indefiniteness issues at the claim construction stage." Eon Corp. IP Holdings LLC v. Aruba Networks Inc., 2014 WL 938511, at *3 (N.D. Cal.). Brandywine has not identified any factual disputes sufficient to preclude the Court from finding that claim 12 indefinite at this stage.

F. '472 Patent

The '472 patent, like the '501 patent, relates to spectrum management technology. The two patents share nearly identical specifications.

The parties dispute three of the '472 patent's claim terms. All three disputed terms appear in claim 1, which reads as follows:

> A method comprising:
> **measuring subscriber loop characteristics**;
> identifying a first allowable class corresponding to the measured subscriber loop characteristics, where the allowable class is chosen from a group of predefined **spectrum management classes**;
> **selecting an operating transceiver from a group of transceivers within a device**, where each transceiver is configured to communicate in a respective at least one [sic] of the predefined **spectrum management classes**, and where the selected operating transceiver is configured to communicate in the first allowable class; and
> **enabling the operating transceiver**.

'472 patent col. 11:60-12:5. The disputed terms also appear in claims 6, 8-11, 15, 17-19, and 22.

1. "(Enabling the / Selecting an) Operating Transceiver (from a Group of Transceivers Within a Device)" (Claims 1, 8)

The parties dispute whether the "enabling"/"selecting" steps described by this term must be "automated." Defendants contend that these steps must be automated because the patent's title and abstract both use the words "automatic" and "automatically" to describe generally how the invention operates.[11] The CenturyTel court rejected this argument. See CenturyTel Order 11 ("Upon consideration of the arguments presented, the Court finds that Defendants' proposed construction would require the Court to inappropriately limit the words of the method steps more than necessary.").

This Court, too, rejects Defendants' proposed construction of these terms. The use of the words "automatic" and "automatically" in the title and abstract is not sufficient to justify the "automated" limitation that Defendants propose. These sections of the patent describe the invention in general terms without reference to the individual steps disclosed in the disputed claims.

The language of claims 8 and 13 further suggests that Defendants' suggested limitation is improper. Claim 8 discloses a "computer-readable medium containing a program designed to perform the steps of: . . . selecting an operating transceiver from the group of transceivers . . .; and enabling the operating transceiver." '472 patent col. 12:28-:43. Claim 13, which is

[11] See '472 patent, Title ("Method and apparatus for automatic selection and operation of a subscriber line spectrum class technology" (emphasis added)), Abstract ("The modem automatically selects a mode of operation that is compliant with one or more of the Spectrum Management Classes." (emphasis added)).

dependent on claim 8,[12] discloses a process wherein the same "program" is "further designed to perform the step of automatically selecting, based on the measured characteristics, one of the transceivers that is compatible with at least one of the spectrum management classes." Id. col. 12:57-:61. Thus, under the doctrine of claim differentiation, it would be improper to construe claim 8 (the independent claim) as limited by the word "automatically," which appears in claim 13 (the dependent claim).[13]

The Court therefore construes these terms according to their plain and ordinary meaning, without Defendants' proposed addition. It construes "enabling the operating transceiver" as "enabling the operating hardware transceiver." Similarly, it construes "selecting an operating transceiver from a group of transceivers within a device" as "selecting an operating hardware transceiver from a group of transceivers within a device."[14]

2. "Measuring Subscriber Loop Characteristics" (Claims 1, 6)

The parties dispute whether this term requires that the "measuring" step in claims 1 and 6 be performed by "analyzing a

[12] Technically, claim 13 is dependent on claim 12, which is in turn dependent on claim 8. This distinction is irrelevant since all of these claims refer to the same computer "program."

[13] Defendants argue that, if these steps are not performed in an "automated" manner, these claims would be invalid because they would not be directed to patentable subject matter under 35 U.S.C. § 101. Because the parties only addressed this issue cursorily in their claim construction briefs, the Court reserves judgment on this question until the parties have briefed the issue more fully.

[14] Brandywine's proposed constructions for these terms referred to "software" transceivers. The Court has therefore added the word "hardware" to these constructions to make clear that, as previously explained, the word "transceiver" refers to a piece of physical hardware in this context.

test signal." Defendants argue that this limitation is required by an excerpt from the specification that states:

> Measurement of loop reach may be accomplished by transmitting from one end of the loop, such as from the CO 2, a signal with a known spectral content and measuring at the other end, such as at the DEC, the level at various frequencies across the frequency band of interest.

'472 patent col. 7:52-:63. Brandywine argues that the term should be construed as "determining subscriber loop characteristics." The CenturyTel court adopted Brandywine's proposed construction. CenturyTel Order 9-10.

This Court finds that each party's proposed construction is inadequate here. Defendants' proposed construction is not tenable because the excerpt they cite for support is permissive rather than mandatory and, as such, does not justify the limitation they have proposed. See '472 patent col. 7:52-:63 ("Measurement of loop reach may be accomplished . . . ." (emphasis added)). Because they fail to identify any other language from the patent to support this limitation, their proposed construction must be rejected.

Brandywine's proposed construction -- which replaces "measuring" with "determining" -- must also be rejected. Although Brandywine asserts that "measuring" and "determining" mean the same thing, it has not adequately justified the need for this substitution. The word "measuring" is not complex or technical and the fact that the patent claims use "determining" and "measuring" in different contexts suggests that the inventor may have understood the two words to have different meanings in the context of the patent.

Thus, because this term uses straightforward language, the Court finds that "measuring subscriber loop characteristics" should be construed according to its plain and ordinary meaning. Neither party has presented compelling reasons for adopting a different construction for this term.

3. "(Predefined) Spectrum Management Classes" (Claims 1, 8-11, 15, 17-19, 22)

The parties' dispute regarding this term mirrors their dispute regarding the same term from the '501 patent. For the reasons outlined above, see supra Section I.E.3, the Court will adopt the same construction for this term that it adopted for the term "spectrum management classes" in the '501 patent: "requirements for data transmission equipment designed to minimize interference with other nearby data transmitters."

II. Brandywine's Amended Infringement Contentions

A. Legal Standard

A party may amend its infringement contentions upon a showing of good cause and by order of the Court. Patent L.R. 3–6. Examples of good cause include

> (a) a claim construction by the Court different from that proposed by the party seeking amendment; (b) recent discovery of material, prior art despite earlier diligent search; and (c) recent discovery of nonpublic information about the Accused Instrumentality which was not discovered, despite diligent efforts, before the service of the Infringement Contentions.

Patent L.R. 3-6. Patent Local Rule 3–6 "serves to balance the parties' rights to develop new information in discovery along with the need for certainty in legal theories at the start of the case." Apple, Inc. v. Samsung Elecs. Co., Ltd., 2012 WL 5632618,

at *2 (N.D. Cal.) (citing O2 Micro Int'l, Ltd. v. Monolithic Power Sys., Inc., 467 F.3d 1355, 1366 (Fed. Cir. 2006)).

The good cause inquiry considers first whether "the party seeking leave to amend acted with diligence in promptly moving to amend when new evidence [was] released." O2 Micro, 467 F.3d at 1363. "In considering the party's diligence, the critical question is whether the party 'could have discovered [the new information] earlier had it acted with the requisite diligence.'" Apple, 2012 WL 5632618, at *6 (citing Google, Inc. v. Netlist, 2010 WL 1838693, at *2 (N.D. Cal.)). The burden is on the moving party to show diligence. Id. If the court finds that the moving party was not diligent in amending its infringement contentions, it does not need to consider the question of prejudice to the non-moving party. See O2 Micro, 467 F.3d at 1368 (affirming the district court's decision refusing leave to amend upon finding the moving party was not diligent, without considering the question of prejudice to the non-moving party). However, even if the movant was arguably not diligent, the court retains discretion to grant leave to amend. Apple, 2012 WL 5632618, at *6 (granting leave to amend infringement contentions, even though court found plaintiff failed to establish diligence, because of lack of prejudice to defendant).

B. Analysis

Brandywine originally filed its infringement contentions in October 2012 and served its supplemental infringement contentions on Defendants in January 2014, just over a week before the close of fact discovery. Its supplemental infringement contentions flesh out a handful of theories set forth in its original

infringement contentions and add a new theory based on induced infringement. Although Brandywine initially failed to move for leave to amend its infringement contentions, it eventually filed a motion for leave to amend in February 2014, soon after Defendants filed their motion to strike the supplemental infringement contentions.

Brandywine contends that it served its supplemental infringement contentions on Defendants at the earliest possible opportunity and that its failure to move promptly for leave to amend was inadvertent. According to Brandywine, its supplemental infringement contentions are based on information that it discovered less than two weeks before it served its supplemental contentions on Defendants. Specifically, it asserts, its amended infringement theories were based on information that it obtained from third-party depositions and 38,000 pages of documents that Defendants produced in January 2014.

Because Brandywine's supplemental infringement contentions appear to be based at least in part on newly discovered information, the Court finds that it acted diligently in serving its amended infringement contentions in January 2014 and seeking leave to amend shortly thereafter. Although Defendants contend that Brandywine could have obtained this information sooner had it acted with greater diligence during discovery, the record does not support this argument. Brandywine served its third-party subpoenas at a relatively early stage of discovery but was ultimately delayed in taking depositions of the relevant third parties because this action was stayed only a few days after those subpoenas were issued.

In any event, even if Brandywine was arguably not diligent in seeking to amend its infringement contentions, the Court may still grant it leave to amend because Defendants have not suffered undue prejudice here. Apple, 2012 WL 5632618, at *5. As noted above, Brandywine's supplemental contentions essentially expand on its previous infringement contentions and do not add any new patent claims or products. The only new infringement theory that Brandywine asserted -- the theory that Defendants induced infringement by competitive local exchange carriers -- was subsequently abandoned because it was not raised or discussed in Brandywine's expert report. Thus, Brandywine's proposed amendments to its infringement contentions were limited in scope. Furthermore, Brandywine proposed these amendments at a relatively early stage in the case, well before Defendants' expert reports were due and eight months before trial was set to begin. To the extent that Defendants needed additional time to take discovery or otherwise respond to Brandywine's proposed changes, they could have sought a stipulation to amend the case management schedule, as they had previously done when they required additional time for discovery. See Docket No. 97, Stipulation to Amend Case Schedule. They did not do so and have not shown that they suffered prejudice as a result of their inability to take additional discovery. Accordingly, Brandywine is granted leave to file its supplemental infringement contentions. See Linex Technologies, Inc. v. Hewlett-Packard Co., 2013 WL 5955548, at *2 (N.D. Cal.) (granting motion for leave to amend infringement contentions where the plaintiff's "proposed amendments to its infringement contentions do not add new patent claims or new products" and the defendants

had "sufficient time to review [the] amended infringement contentions").

CONCLUSION

For the reasons set forth above, the Court construes the disputed claim language in the manner explained; GRANTS Brandywine's motion for leave to amend its infringement contentions (Docket No. 149); and DENIES Defendants' motion to strike Brandywine's supplemental infringement contentions (Docket No. 128).

The Court will hear all dispositive motions and Daubert motions on June 5, 2014 at 2:00 p.m.

IT IS SO ORDERED.

Dated: 4/18/2014

CLAUDIA WILKEN
United States District Judge