IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

LINEX TECHNOLOGIES, INC.,

Plaintiff,

v.

HEWLETT-PACKARD COMPANY, APPLE COMPUTER INC., ARUBA NETWORKS, INC., MERU NETWORKS, INC., RUCKUS WIRELESS, INC.,

Defendants.

/

No. C 13-159 CW

ORDER REGARDING CLAIM CONSTRUCTION AND MOTIONS FOR SUMMARY JUDGMENT

(Re: Docket Nos. 235, 268)

Plaintiff Linex Technologies, Inc. and Defendants Hewlett-Packard Company, Apple Computer Inc., Aruba Networks, Inc., Meru Networks, Inc., and Ruckus Wireless, Inc. ask the Court to construe a number of disputed claim terms. Also before the Court are Defendants' motions for summary judgment on invalidity and non-infringement. On January 23, 2014, the parties appeared for a hearing. Having reviewed the papers and arguments of counsel, the Court construes the terms as follows, GRANTS Defendants' motion on invalidity in part, and GRANTS Defendants' motion on non-infringement on the remaining valid claims.

BACKGROUND

The patents-in-suit relate to the field of wireless data transmissions and spread spectrum technology. Spread spectrum is "a means of transmission in which the signal occupies a bandwidth in excess of the minimum necessary to send the information," which has the benefit of decreasing the effects of interference during

transmission. Acampora Decl. ¶ 8[1] (quoting Docket No. 235-17 (Schilling Tutorial)). Spread spectrum technology operates by applying a code to the data to spread said data. Id. A receiver detects the code-modified signal, which despreads and recovers the original data stream. Id. There are several different types of spread spectrum technology, including Direct Sequence Spread Spectrum (DSSS), Frequency Hopping (FH), and Time Hopping (TH). Acampora Decl. ¶ 11; Docket No. 235-17. One type of spread-spectrum technology, DSSS, combines a sequence of information "bits" with a "chip-sequence" spreading code, comprised of a stream of binary values called "chips," creating a signal with a larger bandwidth than the original data stream. Acampora Decl. ¶¶ 14-15.

Linex owns the patents-in-suit: RE 42,219 "Multiple-input and multiple-output (MIMO) spread spectrum system and method" (the '219 patent) and RE 43,812 "Multiple-input multiple-output (MIMO) spread-spectrum system and method" (the '812 patent). Both are descendant patents of U.S. Patent No. 6,757,322 "Space diversity and coding, spread-spectrum antenna and method" (the '322 patent), which was originally in the suit but has now been dropped by Linex.

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[1] On April 17, 2014, Defendants filed a "corrected" declaration from Dr. Acampora without any explanation for why the correction was warranted. Docket No. 330-4. In response, Linex submitted its own additional substantive arguments. Docket No. 332. By now, the parties have long since finished briefing and arguing the present disputed claim terms and motions for summary judgment, which are under submission. See Docket No. 289. The parties improperly submitted these substantive documents after the matter was submitted, without any justification, and so the Court will not consider them. Cf. Civ. L.R. 7-11, 7-13.

Dr. Schilling invented the parent '322 patent, holding a priority date of November 24, 1998, as well as the two descendant patents, the '219 patent and the '812 patent. Generally, the patents describe and claim a spread-spectrum communication system with multiple antennas at both the transmitter and receiver that improves the quality of the transmission by minimizing shadowing and multipath effects in a fading environment. '322 patent, 1:50-61. The system uses processing circuits that "demultiplex," or split, the input data stream. A plurality of transmitting antennas radiate the demultiplexed spread spectrum signals through the wireless channel to be received by a plurality of receiver antennas with matched filters. '219 and '812 patents, Abstract. A RAKE and a space-diversity combiner then combine the detected signals to reconstruct the original transmission. Id.

Devices may use diversity, or multiple copies of the same data signal, to improve the reliability of signal transmission. See '322 patent, 1:26-32. There are different types of diversity: space diversity and time diversity. A device practices space diversity if it uses several physically-spaced antennas at the receiver which each detect copies of the same signal sent from a transmitter antenna. Acampora Decl. ¶¶ 81-83; Prucnal Decl. ¶ 175. The receiver then adds the plurality of signals together or selects the strongest signal to create the most reliable version of the signal. Id. Time diversity, on the other hand, is related to the effects of multipath, which occurs when a transmitted signal unintentionally reflects off obstructions between the transmitting and receiving end, creating multiple copies that travel along different paths and arrive to the same

point at different times. Id. ¶¶ 22, 95; Prucnal Decl. ¶ 19; Prucnal Supp. Decl. ¶¶ 104, 115. A RAKE is a type of receiver that practices time diversity to reduce the effects of multipath: it separately detects and stores the multiple time-offset copies of the same signal, then either selects the strongest multipath copy of the signal or combines the multiple stored multipath copies to create the most reliable version of the signal. Acampora Decl. ¶ 95.

At the time of claim construction, the asserted claims were: claims 9-10 of the '322 patent; claims 97, 107-109, 119-121, 131-133, and 144-145 of the '219 patent; and claim 97-98, 101-102, and 106 of the '812 patent. See Docket No. 327. Since the claim construction and summary judgment hearing, a number of the asserted claims have been dismissed with prejudice: claims 9-10 of the '322 patent; claims 107, 119-120, 133, and 144-145 of the '219 patent; and claim 106 of the '812 patent. See id. As a result, the remaining claims are: claims 107-109, 121, and 131-132 of the '219 patent; and claims 97-98 and 101-102 of the '812 patent. See id.

DISCUSSION

I. Claim Construction

"To construe a claim term, the trial court must determine the meaning of any disputed words from the perspective of one of ordinary skill in the pertinent art at the time of filing." Chamberlain Group, Inc. v. Lear Corp., 516 F.3d 1331, 1335 (Fed. Cir. 2008). This requires a careful review of the intrinsic record, which includes the claim terms, written description, and prosecution history of the patent. Id.; Phillips v. AWH Corp.,

415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal citations omitted). While claim terms "are generally given their ordinary and customary meaning," the rest of the claim language and the context in which the terms appear "provide substantial guidance as to the meaning of particular claim terms." Phillips, 415 F.3d at 1312-15. Claims "must be read in view of the specification, of which they are a part." Markman v. Westview Instruments, Inc., 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996). Although the patent's prosecution history "lacks the clarity of the specification and thus is less useful for claim construction purposes," it "can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." Phillips, 415 F.3d at 1317 (internal quotation marks omitted). The court may also consider extrinsic evidence, including dictionaries, scientific treatises, and testimony from experts and inventors. Such evidence, however, is "less significant than the intrinsic record in determining the legally operative meaning of claim language." Id. (internal quotation marks omitted).

The parties present four general categories of disputed claim terms to be construed: (A) "spread spectrum signals," (B) "codes," (C) "combining" and "combiner/combining" "circuit/circuitry" terms, and (D) "separating" terms.

A. Spread Spectrum Signals

Term to be construed	Court's construction
"Spread spectrum signals" '219 patent, claims 121, 131-132 '812 patent, claim 101-102	"Signals corresponding to data which has been processed with one or more codes that distribute and increase the bandwidth of the data across the available bandwidth"

This term appears in the following context in claim 121 of the '219 patent:

> 121. A receiver system for recovering data in **spread spectrum signals**, the data conveyed in data symbols by a plurality of different signals transmitted on separate carrier waves from a single source over a wireless channel, said signals being differentiated by different codes conveyed along with said signals . . .

The parties' main disputes regarding this term are (1) whether spread spectrum signals correspond to data, and (2) whether the data is processed by codes or coding.

The Texas court in Linex Technologies v. Belkin International, Inc. et al., considering the same '322 patent asserted in this case, construed a similar term of "spread spectrum subchannel signals" to indicate "signals, corresponding to each of the subchannels of data, which have been processed with one or more codes that distributes each signal across the available bandwidth." Docket No. 235-16 at 20. Defendants propose that this Court adopt a similar construction for the term "spread spectrum signals," deleting the reference to the term "subchannels." While the Texas court's construction regarding a

term of the '322 patent is not binding, the Court finds the underlying reasoning to be persuasive and supported by both the intrinsic and extrinsic evidence here.

The intrinsic evidence supports the contention that the spread spectrum signals correspond to data. In describing how spread spectrum signals are generated, the '322 patent refers to a "system for receiving **data** having symbols, with the **data** having symbols demultiplexed into a plurality of subchannels of **data**, with the plurality of subchannels of **data** spread-spectrum processed as a plurality of spread-spectrum-subchannel signals . . ." '322 patent, 15:40-44 (emphasis added). The drawings that are a part of the specification all show data being processed. See '322 patent, Figs. 1-5. The Texas court accordingly ruled that the spread spectrum signals are comprised of processed data. The claims of the descendant patents, which were not considered by the Texas court, contain substantially similar language, describing the claimed invention as a system for "recovering **data** in spread spectrum signals." '812 patent, claim 101; '219 patent, claim 121 (emphasis added). The specification is consistent and describes "the present invention" as a system "for transmitting data having symbols." '219 patent, 2:1-4. "When a patent thus describes the features of the 'present invention' as a whole, this description limits the scope of the invention." Verizon Servs. Corp. v. Vonage Holdings Corp., 503 F.3d 1295, 1308 (Fed. Cir. 2007). Data is therefore a component of the spread spectrum signals described in the patent.

The parties debate whether the term "data" further denotes "user data," or must be "unknown" to the recipient. See Docket

No. 283-3 at 3. The Court finds additional construction of the term "data" to be unnecessary and potentially confusing. The jury will be able to understand "data" according to its ordinary meaning in the art, which is the information that is intended to be conveyed to the receiver and is thus unknown to said receiver. The purpose of the invention is to "transmit[] data having symbols," or in other words, to communicate some information to the receiver. See '219 patent, 2:8-12. See also '812 patent, col. 1, ll. 40-41 (describing the process of sending "data" from "terminal to base, or vice versa," and encountering the problems of shadowing "by buildings, foliage, vehicles, people, motion of the terminal, etc."). "Data is what the receiver ultimately hopes to recover." Acampora Decl. ¶ 216; see also Prucnal Supp. Decl. ¶¶ 101-02 (discussing "payload data" as the information intended to be communicated to the receiver). Contrary to Linex's suggestion, the definition of "data" is not broad enough to encompass any "numerical or other information represented in a form suitable for processing by computer." Am. Heritage Dictionary 353 (3d ed. 2000). Such a definition would be meaningless in the context of the patent and would engulf the meaning of codes. Because the patent discusses repeatedly the processing of codes with data, the patentee intended the two to carry a distinct meaning. In the context of the stated goals of the invention, data is unknown and is the information intended to be conveyed to the receiver. By contrast, codes are "predetermined" keys that are known by the receiver and aid in communicating the data.

The spread spectrum signals of the invention also require the use of codes to process the data. This is true of every embodiment described in the specification. See '322 patent, 2: 14-17. The preferred embodiments describe the use of chip-sequence signals as the codes used to process the data and generate the spread spectrum signals. See id.; Acampora Decl. ¶¶ 14, 71 (chip-sequence signals are codes). The following excerpt from the specification illustrates this process:

> The spread-spectrum means spread-spectrum processes the plurality of subchannels of **data** with a plurality of chip-sequence signals, respectively. Each chip-sequence signal is different from other chip-sequence signals in the plurality of chip-sequence signals. The spread-spectrum means thereby generates a plurality of spread-spectrum subchannel signals, respectively. Each spread-spectrum sub-channel signal is defined by the code represented by a respective chip-sequence signal.

'219 patent, col. 5, ll. 23-31. The specification goes on to state that "spread-spectrum processing typically includes multiplying the plurality of subchannels of data by the plurality of chip-sequence signals." Id., 7:45-47. The function of the chip-sequence signal is to spread the bandwidth of the data to be transmitted. Accordingly, the specification of all three patents demonstrates that spread spectrum signals result from the spreading of data with codes.

Linex proposes that the construction should use the word "coding" instead of "codes." Linex argues that the specification refers to other "coding" techniques in at least four places. See '219 patent, 1: 31; 2:3; 4:47-48; 12:16-28. The Court is not persuaded. The specification excerpts cited by Linex use the

terms interchangeably, suggesting that, despite the fact that the two terms vary in choice of suffix, they actually carry the same meaning. Linex seems to argue that "coding" would somehow encompass "coding algorithm," but provides no explanation for this conclusion. Regardless, the patents-in-suit never mention the use of a coding algorithm at all, nor do they discuss any relevant coding in regards to generating a spread spectrum signal. Linex suggests error correction coding as an example of "coding," which could possibly be embodied by the Forward Error Correction (FEC) encoder described by the patent. See '219 patent, 5:12-35 ("The FEC means FEC encodes the data, thereby generating FEC data). But the FEC means is not responsible for creating the spread spectrum signal; the "chip sequence signal generator" is responsible. '219 patent, 2:16-28 ("The FEC encoder encodes the data using an error correction code to generate FEC data . . . The plurality of spread-spectrum devices, spread-spectrum processes the plurality of subchannels of data with a plurality of chip-sequence signals, respectively . . . [and] thereby generates a plurality of spread-spectrum subchannel signals, respectively."). Therefore, for purposes of defining the term "spread spectrum signals," the coding accomplished by the FEC encoder is not relevant. Only the code that results in spread spectrum processing is relevant to construction of the "spread spectrum signals" element.

Linex attempts to introduce extrinsic evidence to show that coding algorithms are used by other claimed spread spectrum systems, such as multi-carrier spread spectrum (Docket No. 235, Ex. 25), OFDM modulation, CCK, and PBCC. Prucnal Decl. ¶¶ 71-72. This is not sufficient to overcome the intrinsic evidence

previously discussed that explicitly discloses the process of generating spread spectrum signals.

B. Codes

Term to be construed	Court's construction
"Codes" '219 patent, claims 107-109, 121, 131-132 '812 patent, claims 97-98, 101-102	"A predetermined sequence of bits and symbols"

The term "codes" appears in all of the asserted claims of both the '219 patent and the '812 patent. For example, claim 109 in the '219 patent reads:

> 109. A method for recovering data conveyed in data symbols by a plurality of different signals transmitted on separate carrier waves from a single source over a wireless channel, said signals being differentiated by different **codes** conveyed along with said signals, comprising the steps of:
>
> Receiving said signals at plural receiving antennas;
> Demodulating the signals received at each receiving antenna and separating said signals by detecting said different **codes** conveyed in said signals;
> [. . .]

Linex argues that code is a broad term and should be understood according to its plain and ordinary meaning. One skilled in the art of telecommunication systems would understand "code" to mean "a predetermined set of bits or symbols." See InterDigital Commc'ns, LLC v. Int'l Trade Comm'n, 690 F.3d 1318, 1324 (Fed. Cir. 2012). Defendants disagree, contending that although the claim language itself is broad, the emphasis on spread spectrum in the specification mandates that the "codes" of

the claim language can only be spreading codes. See Markman, 52 F.3d at 979.

"[T]here is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification." Comark Commc'ns, Inc. v. Harris Corp., 156 F.3d 1182, 1186 (Fed. Cir. 1998). The Federal Circuit has repeatedly cautioned against importing limitations from the specification into the claim. Phillips, 415 F.3d at 1323. For example, the claims are not limited to what is in the specific embodiments of the claimed invention. Id. (quoting Nazomi Commc'ns, Inc. v. Arm Holdings, PLC, 403 F.3d 1364, 1369 (Fed. Cir. 2005) (although the specification may cast light on the meaning of the claims, "the court may conclude that the scope of the various claims may differ, some embracing different subject matter than is illustrated in the specific embodiments in the specification"). On the other hand, a claim should not be read beyond the sole disclosed embodiments where such a reading would be contrary to the written description's guidance as to the meaning of the claims. SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc., 242 F.3d 1337, 1344 (Fed. Cir. 2001) (holding that where the specification expressly limited all embodiments of the claimed invention to a coaxial structure and disparaged prior art using dual lumens, the patentee made a clear disavowal of the dual lumen design). A patentee is not entitled to the broad, plain and ordinary meaning of the claim term if he has made a clear disavowal of claim scope or has acted as his own lexicographer in defining the term. Thorner v. Sony Computer Entm't Am. LLC, 669 F.3d 1362, 1367 (Fed. Cir. 2012). "Both

exceptions require a clear and explicit statement by the patentee." Id.

Read in the context of the claim language, the codes in question are conveyed along with and in the signals and are used to differentiate said signals. See '219 patent, claim 109. The specification uses the term "codes" broadly, referring to codes other than spreading chip-sequence signals. See, e.g., '219 patent, 1:27-31 ("Coding techniques using space diversity as well as time, are known as 'space-time' codes"), 4:12-17 ("The FEC means FEC encodes the data, thereby generating FEC data . . . the use of a particular FEC code is a design choice"). The varied use of "codes" throughout the specification demonstrates that the patentee did not act as his own lexicographer, but rather freely utilized the accepted meaning of the term in the art. Further, the patentee at times added a modifier to the term "codes." For example, the '812 patent contains a number of dependent claims that specify that certain codes that are "spreading codes." '812 patent, claim 114 ("The receiver system of claim 97 wherein said different codes conveyed along with said signals are spreading codes") and claim 116 ("The method as recited in claim 99 wherein said different codes conveyed along with said signals are spreading codes"). The fact that the patentee sometimes referred to "codes" and sometimes to "spreading codes" indicates that the two are different, and that the former should be construed according to its ordinary meaning in the art. The doctrine of claim differentiation is the strongest in this scenario, "where the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim." InterDigital

Commc'ns, LLC, 690 F.3d at 1324 (finding that "codes" as unmodified was not a spreading code).

Defendants next contend that the patentee made a clear disavowal of claim scope in the prosecution history. During prosecution of the reissue of the '219 patent, Linex amended the "Detailed Description of the Preferred Embodiments" section of the specification to read, "Each spread-spectrum means thereby generates a plurality of spread-spectrum-subchannel signals, respectively. Each spread-spectrum-sub-channel signal is defined by **the code represented by** a respective chip-sequence signal." '219 patent, 5:26-31 (emphasis added). In its amendment, Linex inserted the phrase "the code represented by." In its Response to Office Action, the patentee explained, "This submission includes an amendment to the specification to include the words 'the code represented by' which is inherent in spread spectrum processing . . ." Docket No. 235-14 (Feb. 23, 2010 Response to Office Action) at 12. Fairly read, this amendment notes that a chip-sequence signal is only a nonlimiting example of said code defining the signal. If anything, the amendment makes the sentence less restrictive. The statement made during prosecution does not amount to the type of clear and unmistakable disclaimer required by Thorner.

Additionally, during the prosecution of the same patent the patentee stated his intent to broaden the patent's scope, not limit it:

> This reissue application is broadening to correct errors of claiming less than the patentee had a right to claim. Broadening results from adding new claims "spread spectrum" broadly to cover spread spectrum processing of all types within the conventional meaning of "spread

> spectrum" in connection with receiver systems and methods for use in MIMO and from adding new claims covering receiver system and methods for processing received signals containing codes indicating transmission of the signals from different transmitting antennas.

Docket No. 235-22 at 2. This statement demonstrates the patentee's intention (1) to broaden the patent to encompass spread spectrum systems "broadly," and (2) to add new claims for processing "received signals containing codes indicating" their originating antennas, with no mention of these codes necessarily being spreading codes. Because there was no apparent intent by the patentee to "deviate from the ordinary and accustomed meaning" of "codes" in either the specification or the prosecution history, the patentee is entitled to the full scope of the term in the art. Thorner, 669 F.3d at 1366.

C. Combining and Combiner Circuit

Terms to be construed	Court's construction
"Combining" '219 patent, claims 107-109, 121, 131-132 '812 patent, claims 98, 102	"Aggregating"
"Combiner/combining" "circuits/circuitry" '219 patent, claims 107-108, 121 '812 patent, claims 98, 102	No additional construction necessary. See above.

The term "combining" appears in claim 109 of the '219 patent in the following context:

> [. . .]
> Recovering the data symbols conveyed in said signals and combining received data symbols transmitted in signals with the same code and received by different receiving antennas, thereby forming plural streams of combined data symbols; and
> Multiplexing data derived from said plural streams of combined data symbols to form a single stream of data.

Defendants argue that the term should be construed in line with the Texas court's construction regarding the '322 patent. The Texas court ruled that "combining" in the context of the invention meant "forming a single aggregated version of the received signal from the multiple versions of the transmitted time and space diverse signals received at the multiple receiver antennas." Docket No. 235-16 at 27. That ruling recognized that the claimed invention required the use of both space and time diversity. Accordingly, Defendants urge this Court to adopt a meaning of "aggregating time and space diverse signals."

Linex takes issue with this proposed construction because it dictates the components that are to be combined, rendering the rest of the claim language superfluous. See, e.g., '812 patent, claim 98 ("space diversity combiner circuitry for combining signals received on said different receiving antennas, whereby said data inputs to said multiplexer are derived from data symbols generated by combining symbols from each of said receiving antennas"). The function of "combining" can be easily understood and should be construed according to its plain and accustomed meaning in the art, or "aggregating."

Linex correctly notes that "a court must presume that the terms in the claim mean what they say, and, unless otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms." Johnson Worldwide Associates, Inc. v. Zebco Corp., 175 F.3d 985, 989 (Fed. Cir. 1999). Defendants respond that, even if the claim language itself is broad, the term should be construed more narrowly because of the specification and statements made during the prosecution of the '322 patent. Thorner, 669 F.3d at 1366. Here, the specification repeatedly emphasizes that the present invention employs both time and space diversity to increase capacity and performance of the system. "The present invention broadly includes an antenna system employing time (RAKE) and space (antenna) diversity." '812 patent, 4:48-50; '322 patent, 4:38-41. Defendants further argue that Linex made statements during the prosecution history of the '322 patent that constituted a disavowal of a system using only space diversity. Statements made during prosecution of a parent application do not automatically limit the scope of a later application; the limiting effect depends on whether the descendant patents use the same language. Compare Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1333 (Fed. Cir. 2003) (disavowal of claim scope during prosecution of parent application applied where patents used same claim term involving same limitation) and Ventana Med. Sys., Inc. v. Biogenex Labs., Inc., 473 F.3d 1173, 1182 (Fed. Cir. 2006) (prosecution history disclaimer did not apply to descendant patent because they used different claim language).

Even if Defendants can show that space and time diversity is required, the Court cannot import limitations into claims that do not contain any textual reference to the limitation. Johnson Worldwide Associates, Inc., 175 F.3d at 990. The claim language must invite an interpretation that includes the limitation; if courts "begin to include elements not mentioned in the claim in order to limit such claim, [they] should never know where to stop." Id. Here, nothing connects the supposed requirement of an antenna system employing time and space diversity to the function of "combining." Focusing on how a person of ordinary skill in the art would understand the claim terms, it is not clear that such a person would equate "combining" to "aggregating space and time-diverse signals." See Phillips, 415 F.3d at 1323. The function of the "combining" term itself is to aggregate different data signals. See '219 patent, claim 121 ("Combiner circuits for combining received data symbols . . ."). The rest of the claim language elaborates on what exactly is to be combined, which in at least some instances translates to diversity. See id. ("Combiner circuits for combining received data symbols transmitted in signals with the same code **and received by different receiving antennas**, thereby forming plural streams of combined data symbols"). Because Defendants have not established the necessary link between the term "combining" and the space and diversity limitation they argue exists, the Court declines to import that limitation. A definition of "combining" as "aggregating" adequately describes the process.

The parties additionally dispute the meaning of three related "combiner circuitry" terms which describe how circuits perform the

"combining" function. Linex alleges that these additional terms do not require construction, but if the Court chooses to construe them, then Linex proposes simply replacing "combining" with "aggregating" in each of the phrases. See Docket No. 200 at 7.

Defendants contend that, although they are each phrased differently, all of the "combiner/combining" "circuits/circuitry" terms should be universally construed as "circuits that combine data symbols in the separated signals originating from different receiving antennas according to the code transmitted with each signal." The Court has already construed "combining." These terms do not require any further construction because the function of the combiner circuits is described by the claim language that follows -- the combiner circuit combines the received data symbols transmitted in signals with the same code, which are received by different receiving antennas. See, e.g., '219 patent, claim 121.

D. Separating

Terms to be construed	Court's construction
"Separating" '219 patent, claims 109, 121, 133 '812 patent, claims 97, 101.	"Distinguishing signals based on the codes in each individual signal"

This term appears in similar contexts of multiple claims. See '219 patent, claims 109, 121, 133; '812 patent, claims 97, 101. All of these terms describe the function of "separating" signals as related to the detection of the different codes conveyed in the signals. See, e.g., '219 patent, claim 109

("separating said signals by detecting said different codes conveyed in said signals"); claim 121 ("separating said received spread spectrum signals by detecting said different codes conveyed in said spread spectrum signals"); '812 patent, claim 101 ("Circuitry for despreading and separating said different spread spectrum signals in response to detections of said different codes conveyed in said signals").

Linex's view is that separating can be understood according to its dictionary definition, which is "distinguishing." See Am. Heritage Dictionary 1242 (3d ed. 2000) ("To differentiate or discriminate between; distinguish"). Defendants urge the Court instead to adopt a definition of "separating the received signals into the individual transmitted signals and their multipath components by detecting the codes mixed with the data symbols in each individual transmitted signal."

As they did regarding their proposed construction of the term "combining," Defendants again emphasize that the claimed invention requires time diversity. Because "combining" and "separating" go hand-in-hand, the same limitations ought to apply here. Defendants allege that Linex disavowed any method or device which does not involve time diversity, or multipath, during the prosecution of the '322 patent. As noted previously, the strength of the purported disavowal and its application to the child patents are far from clear. More fundamentally, however, there is no textual "hook" in the language of the "separating" claim terms that invites insertion of the time diversity limitation. Nowhere in the specification is there any limitation that connects the

function of "separating" with sorting based on multipath components.

The claim language explicitly discloses that the codes facilitate "separating" of the transmitted signals. See, e.g., '219 patent, claim 121. Separating, which occurs upon receipt of the signal, is the counterpart to application of the codes at the transmission stage. See Acampora Decl. ¶ 17 ("Reception of a spread spectrum signals is very similar to its transmission, just run in reverse"). Upon receipt of the signals, matched filters identify signals containing a certain code. Id. ¶¶ 18-19; '219 patent, Abstract. Accordingly, "separating" can be understood as "distinguishing signals based on the codes in each individual signal."

II. Defendants' Motions for Summary Judgment

A. Summary Judgment Standard

Summary judgment is appropriate only where the moving party demonstrates there is no genuine dispute as to any material fact such that the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a); Celotex Corp. v. Catrett, 477 U.S. 317, 323 (1986). Material facts are those that might affect the outcome of the case, as defined by the framework of the underlying substantive law. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986). A dispute is genuine if the evidence is such that a reasonable jury could return a verdict for either party. Id. The moving party bears the initial burden of informing the district court of the basis for its motion and identifying those portions of the pleadings, discovery, and affidavits that demonstrate the absence of a disputed issue of material fact.

Celotex, 477 U.S. at 323. In opposing the motion, the non-moving party may not rely merely on allegations or denials of its pleadings, but must set forth "specific facts showing that there is a genuine issue for trial." Anderson, 477 U.S. at 248 (citing Fed. R. Civ. P. 56(e)).

The court must construe the evidence in the light most favorable to the non-moving party, making all reasonable inferences that can be drawn. Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp., 475 U.S. 574, 587 (1986); Intel Corp. v. Hartford Accident & Indem. Co., 952 F.2d 1551, 1558 (9th Cir. 1991); Eisenberg v. Ins. Co. of N. Am., 815 F.2d 1285, 1289 (9th Cir. 1987).

B. Invalidity

Patents are presumed valid absent clear and convincing evidence of invalidity. Microsoft Corp. v. i4i Ltd. P'ship, 131 S. Ct. 2238, 2242 (2011). A patent is anticipated and therefore invalid if it was disclosed in a patent application or a published patent. 35 U.S.C. § 102(a). To show anticipation, the moving party must "explain in detail how each claim element is disclosed in the prior art reference." Schumer v. Lab. Computer Sys., Inc., 308 F.3d 1304, 1315 (Fed. Cir. 2002). When the moving party relies on prior art that was already considered by the USPTO to prove invalidity, the burden of proof is especially difficult. Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1467 (Fed. Cir. 1990).

Defendants claim that U.S. Patent No. 5,345,599 (Paulraj) anticipates each of the asserted claims of the '219 and '812 patents. The USPTO considered Paulraj during prosecution of the

'219 and '812 patents. Prucnal Supp. Decl. ¶ 63. Paulraj, entitled "Increasing capacity in wireless broadcast systems using distributed transmission/directional reception (DTDR)," discloses a method and apparatus for increasing the capacity of a wireless broadcast communications system. The invention operates by demultiplexing or splitting a signal into multiple signals, sending the signals using multiple spatially-separated transmitters, then receiving the signals at a receiving site with multiple antennas and reconstituting the original data signal. Paulraj, Abstract. The invention disclosed by Paulraj is embodied by Figure 2 of the patent:

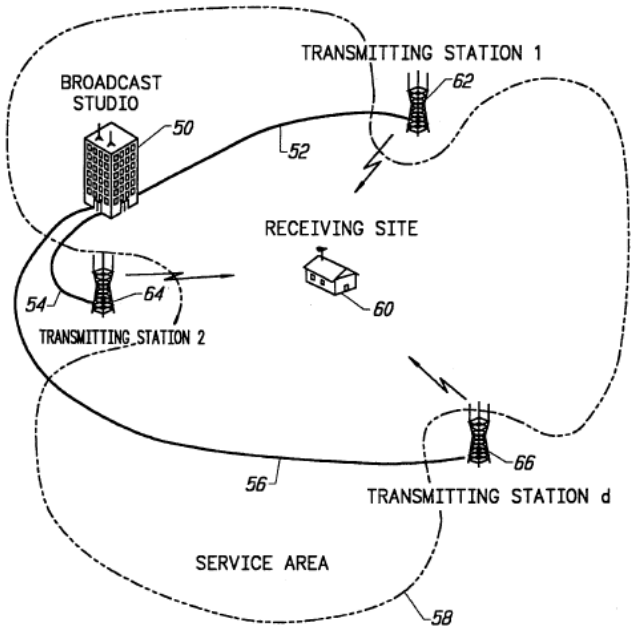

FIG. 2

The parties agree that Paulraj discloses all but three elements in the asserted claims: (1) signals from a single source, (2) codes conveyed along with said signals, and (3) spread spectrum signals.[2]

1. Signals from a single source

Linex characterizes Paulraj as teaching transmission of data signals from multiple sources rather than a single source as required by the claimed invention. All of the asserted claims require the signals to originate from "a single source." For example, claim 109 recites:

> A method for recovering data conveyed in data symbols by a plurality of different signals transmitted on separate carrier waves from **a single source** over a wireless channel . . .

It is undisputed that the "source" means the origin of data in said signals. Linex's infringement expert expressly confirms this point, stating, "One of ordinary skill in the art would understand that the plain language of the asserted claims of the '219 and '812 patents requires that the different 'signals' must come from a single source or data source." Prucnal Supp. Decl. ¶ 73 (emphasis omitted). The specification corroborates that the "source" is "of data." '219 patent, 1:55-56. The claims of the '812 patent too demonstrate that the "single source" is the "data source" of the signals. '812 patent, claim 97. As discussed in the background of the asserted patents, the data is split into different subchannel signals which are then transmitted by a

[2] See Docket No. 268-4 at 35 (detailing the parties' experts' agreement that all of the elements of the asserted claims except the three identified are disclosed by Paulraj). This agreement was confirmed at the hearing. Docket No. 294 at 47-48.

plurality of antennas, then received by a plurality of receiving antennas and reconstituted to form the original data stream.

As demonstrated by Figure 2, Paulraj also teaches a "single data source." Paulraj, claim 1 ("A wireless broadcast system for transmission of **a source signal** from a plurality of spatially separated transmitters . . ."). The single source in Paulraj is embodied by broadcast studio (50). Figure 2 plainly shows the signals originating from broadcast studio (50), which are then transmitted by different transmitting stations to the receiver. Linex insists that the "transmitted signals in Paulraj are not from a single source because Paulraj requires his transmitting stations 1, 2, and 3 to be dispersed over a wide geographical area." Docket No. 273-4 at 23. Linex cites to several excerpts of the specification of Paulraj discussing the desirability of spatially dispersed transmitting antennas. Prucnal Supp. Decl. ¶ 74. But Linex mistakes the "single data source" limitation of the patents-in-suit for a nonexistent requirement that the plurality antennas be closely situated, which does not exist in either of the asserted patents. The asserted claims are silent as to the distance between the transmission antennas, requiring only that the receiving signals originate from a single data source. In fact, nothing in any of the claims of the '219 or the '812 patents mandates a maximum separation between the plurality of antennas; the patent elsewhere discloses a minimum distance between the antennas but never a maximum. '219 patent, 2:49-51 ("antennas preferably by at least one-quarter (1/4) wavelength, and **preferably as far as practicable"**) (emphasis added).

2. "Codes conveyed along with" and "in" said signals

In every asserted claim, the signals are differentiated by "different codes conveyed along with" and "conveyed in said signals." See, e.g., '219 patent, claim 109. Both of these limitations appear in every asserted claim. See id. Neither party asked the Court to define the terms "conveyed along with" or "in" or "signal." In their separate motion for summary judgment of non-infringement, Defendants advocate a construction of "conveyed along with" and "in" to mean that the codes and the rest of the signal occupy the same time and frequency. Docket No. 283-3 at 13.[3] Defendants present no compelling evidence in support of this proposed construction. The only evidence offered by Defendants is that all of the disclosed preferred embodiments show codes being conveyed at the same time and frequency as the rest of the signal. But as previously discussed, the invention is not limited to what is disclosed in the preferred embodiments. Nazomi Commc'ns, Inc., 403 F.3d at 1369. Because no counter proposal was offered, and these terms can be understood according to their plain and ordinary meaning, the Court does not assign any special meaning to these terms.

According to Linex, Paulraj differs from the claimed invention of the '219 and '812 patents because Paulraj discloses the transmission of codes that travel independently and separately from signals carrying payload data. Paulraj discloses several

[3] Defendants reason that if the more specific construction of these terms is adopted, then the accused devices do not infringe; if that construction is not adopted, and this limitation is read broadly, then the claims are invalid.

methods for "selectively suppress[ing] signals" based on their predefined characteristics, or distinguishing them from each other. Such known characteristics may include "knowledge of spatial information such as the array covariance matrix, the steering vectors," "array characterizing data," etc. Paulraj, col. 9, ll. 55-60. For example, in the "tracking mode, the array characterizing data is directly (or indirectly) updated during signal reception, and the spatial filter parameters updated continuously." Id., col. 9, ll. 66-70; col. 10, ll. 1-2. Because characterization information is updated continuously "during signal reception," the codes must be conveyed along with, or adjacent to the signal. Acampora Decl. ¶ 376; Paulraj, 9:66-10:1. Another example of Paulraj disclosing codes conveyed with and in said signals is in describing another embodiment: "In another embodiment, different, but known, signals are transmitted simultaneously from each tower." Paulraj, 10:15-17. Paulraj thus describes codes that are "conveyed along with" and "in" each signal that differentiate these signals.

Linex disagrees, pointing out that "the training signals in Paulraj may be sent from transmit antennas different than those sending payload data." Docket No. 273-4 at 24-25 (citing Prucnal Supp. Decl. ¶ 71). Linex concedes that Paulraj "teaches that array characterizing data may be 'updated during signal reception.'" Prucnal Supp. Decl. ¶ 70. This is the basis of Defendants' argument -- that codes continuously update the signal transmission. However, Linex stresses that in describing another embodiment, Paulraj "also separately teaches special 'different, but known' signals that may be sent to measure array

characterizing data." Id. (citing Paulraj, 10:3-20). The training signals, or codes, may possibly be conveyed from different antenna than those that convey the payload data. This claim, even if true, does not take away from the excerpts identified by Defendants, which expressly recognizes that the training signals can be "transmitted at regular intervals from one transmitter at a time, or from different transmitters simultaneously." Prucnal Validity ¶ 879; Acampora Decl. ¶¶ 371, 373-377, 389. See also Prucnal Supp. Decl. ¶ 67 (noting that each receiving antenna will receive "each of the transmitted signals from each of the" transmitting antennas) (citing Paulraj, 7:50-52) ("A receiving station . . . will receive all d signals [i.e., all transmitted data signals] in the same frequency channel"). In at least the examples raised by Defendants, Paulraj teaches codes that are "conveyed along with" and "in" said signals.

3. Spread spectrum signals

Of the asserted claims, some recite "spread spectrum signals" and others recite simply "signals." Defendants claim that, under Linex's infringement theory, "there is no material difference between the training signals in Paulraj and those in the Accused Products," and so the training signals in Paulraj satisfy the "spread spectrum signals" limitation. Linex's responds that while Paulraj may discuss the use of coding and decoding, it fails to disclose what type of coding is used and how it is used. Docket No. 273-4 at 25.

The meaning of "spread spectrum signals" is specific -- the Court construed this term to mean "signals corresponding to data which has been processed with one or more codes that distribute

and increase the bandwidth of the data across the available bandwidth." Nothing in Paulraj describes a code that processes data in a way that distributes the signal across the available bandwidth. The "spread spectrum signals" limitation is the only element of the claimed invention not disclosed by Paulraj. Because this element appears in some of the asserted claims (claims 121, 131-132 of the '219 patent; claims 101-102 of the '812 patent), those claims are valid. The rest of the asserted claims (claims 107-109 of the '219 patent; claims 97-98 of the '812 patent), which read simply "signals" rather than "spread spectrum signals," are completely anticipated by Paulraj and are thus invalid.

C. Non-infringement

To establish infringement, each claim limitation must be present in the accused product, literally or equivalently. Dawn Equip. Co. v. Kentucky Farms, Inc., 140 F.3d 1009, 1014 (Fed. Cir. 1998). Determining patent infringement is a two-step process: first, the court must construe the asserted claims; then, the court must compare the accused products with the construed claims and determine whether the products contain each limitation of the claims, either literally or equivalently. Freedman Seating Co. v. American Seating Co., 420 F.3d 1350, 1356-57 (Fed. Cir. 2005). A product literally infringes if it contains each element and limitation of the patent claim as construed. Id. at 1357. A product may also infringe under the doctrine of equivalents, which applies if there is "'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." Id. Equivalence must be assessed on a

limitation-by-limitation basis; the standard test for equivalence is whether the accused product performs substantially the same function, in substantially the same way, to obtain substantially the same result for every asserted claim. Id. at 1358; Abbott Laboratories v. Sandoz, Inc., 566 F.3d 1282, 1296-97 (Fed. Cir. 2009).[4]

Defendants all practice the wireless standard known as IEEE 802.11n, which uses orthogonal frequency division multiplexing (OFDM) and combines that technology with multiple antenna technology known as "multiple-input multiple-output" (MIMO). Prucnal Supp. Decl. ¶ 79; Docket No. 274, Ex. 74 (IEEE 802.11n Standard).

In OFDM, data and other transmission information is transmitted in "packets," or groups. Acampora Non-Infringement Rept. ¶¶ 232-239; Prucnal Supp. Decl. ¶ 79-88. The packets consist of: HT-LTF, a P-matrix or a set of P-codes, payload data, and pilot sequences. Acampora Non-Infringement Rept. ¶ 233; Prucnal Supp. Decl. ¶ 88. The first phase is channel estimation and MIMO equalization. Prucnal Supp. Decl. ¶ 89. During this phase, a long training field is sent, which is comprised of an HT-

[4] To defeat a summary judgment motion of non-infringement on doctrine of equivalents grounds, a patentee must provide "particularized testimony and linking argument" on a limitation-by-limitation basis "that creates a genuine issue of material fact as to equivalents." AquaTex Indus., Inc. v. Techniche Solutions, 479 F.3d 1320, 1328 (Fed. Cir. 2007). "Generalized testimony as to the overall similarity between the claims and the accused infringer's product or process will not suffice." Id. Linex failed completely to address the doctrine of equivalents in response to Defendants' motion for summary judgment, thus waiving any equivalency theory. The Court therefore considers only whether every limitation is literally present in the accused devices.

LTF modified mathematically using a P-matrix, or a known set of 1s and -1s in matrix form. Id. ¶¶ 84-85; Acampora Non-Infringement Rept. ¶ 236. During transmission, this field is modified by the wireless channel. The receiver knows the HT-LTF information and uses a channel-estimating mechanism to compare the known HT-LTF to the HT-LTF received. Prucnal Supp. Decl. ¶ 93; Acampora Non-Infringement Rept. ¶ 646. The receiver creates a mathematical entity (H-matrix) documenting the differences between the known HT-LTF stored at the receiver and the modified HT-LTF received; the differences are those caused by transmission through the wireless channel. Id.; Acampora Non-Infringement Rept. ¶ 236. Next, after training, the data-bearing OFDM symbols are transmitted. Prucnal Supp. Decl. ¶ 86. Accompanying the data are pilot signals, or predetermined sequences of bits, which are also modified by the wireless channel and are used to update channel conditions that may have occurred after the training interval. See id. ¶ 104; Acampora Non-Infringement Rept. ¶ 235.

Defendants contend that certain elements of the asserted claims are not satisfied by the accused devices: (1) "spread spectrum signals," (2) "codes conveyed along with" and "in" the "signals," and (3) "separating" and "combining."[5] Because the Court has already found several claims to be invalid, and validity

[5] Defendants' "separating" and "combining" non-infringement arguments rely on the presumption that the Court would imply space and multipath limitations in its construction of those terms. Because the Court declined to adopt Defendants' proposed constructions, these non-infringement arguments are now moot.

is a prerequisite to any infringement claim,[6] the Court considers only the accused devices' potential infringement of the remaining valid claims.

Defendants first argue that the accused products do not infringe the limitation "spread spectrum signals," which appears in all of the remaining valid claims. Linex disagrees and contends that the OFDM packets produced by the accused devices are in fact spread spectrum signals.

The Court construed "spread spectrum signals" to mean "signals corresponding to data which has been processed with one or more codes that distribute and increase the bandwidth of the data across the available bandwidth." To infringe this limitation, the OFDM packets must include (1) data, (2) that has been processed by codes to increase the bandwidth of that data. Linex raises two infringement theories regarding the OFDM packet: (1) the P-matrix spreads the bandwidth of HT-LTF data, creating a spread spectrum signal, and (2) pilots spread the bandwidth of the payload data, creating a spread spectrum signal. Docket No. 273-4 at 15.

Regarding its first infringement theory, Linex claims that the P-matrix is the code that processes the HT-LTF data to double the bandwidth of the HT-LTF data. Prucnal Decl. ¶¶ 84-88, 91. It is undisputed that the P-matrix is a predetermined sequence of

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[6] TypeRight Keyboard Corp. v. Microsoft Corp., 374 F.3d 1151, 1157 (Fed. Cir. 2004) ("a judgment of invalidity necessarily moots the issue of infringement"). See also Sandt Technology, Ltd. v. Resco Metal and Plastics Corp., 264 F.3d 1344, 1356 (Fed. Cir. 2001); SSI Sys. Int'l Inc. v. TEK Global S.R.L., 929 F. Supp. 2d 971, 984 (N.D. Cal. 2013).

bits, which meets the definition of code. The HT-LTF, however, is not the unknown information that is intended to be conveyed to the receiver. The receiver already has stored copies of the known HT-LTF sequences. The HT-LTF therefore does not meet the limitations of data. The HT-LTF is more akin to a code that the transmitter sends first to the receiver so that the receiver can understand the state of the wireless channel.

Linex's infringement expert concedes this point. The HT-LTF is "used to estimate the channel properties for transmission of the OFDM packets and to control the MIMO equalization process." Prucnal Supp. Decl. ¶ 93. The HT-LTF therefore tests and defines the channel so that the receiver will know how to interpret the actual data to be conveyed. Id. "HT-LTFs, P codes, and pilots are information that the [accused] devices use to distinguish which packet was transmitted from which transmit antenna." Prucnal Supp. Decl. ¶ 88. The expert further admits that the "HT-LTF data is test and control data" and is not the information intended to be conveyed to the recipient. Id. This demonstrates that HT-LTFs are not data, but codes. Further supporting the contention that HT-LTF is not data as defined by the asserted claims is the expert's attempt to distinguish prior art elsewhere in his declaration. See id. ¶ 95 (distinguishing Marzetta reference on the basis that "Marzetta teaches that 'training signals' are sent in a 'first stage' -- the training stage, which is separate and independent of a 'second stage,' in which '**message data** or other information' are transmitted . . . Codes are not sent along with and in signals containing the **message data** during system operation"); ¶¶ 70-71 (distinguishing Paulraj reference

because it "does not teach that the training signals would be conveyed along with and in signals that also carry **payload data**"). The accused devices work in a fashion similar to the distinguished prior art references Marzetta and Paulraj, sending a training stage separate and apart from the message data. No reasonable jury could determine that the HT-LTFs constitute data.

Linex's next infringement theory is that the pilot codes modify the payload data, creating a spread spectrum signal. Linex contends that pilots are a predetermined sequence of bits that process and spread the payload data. Prucnal Supp. Decl. ¶ 98. Linex's infringement expert explains that the payload data is inserted on certain IDFT subcarriers while pilots are inserted onto separate IDFT subcarriers which are disbursed among the data subcarriers. Id. The inventor agrees with this assessment. Docket No. 283-5 (Schilling Depo.) at 443-44 ("I believe the pilot signals have their own unique channel and they do not vary with the data"). In other words, it is undisputed that the pilot codes are transmitted on separate subcarriers, or frequencies, from the payload data and do not process or spread the payload data across the available bandwidth. By the undisputed evidence, Linex's second infringement theory also fails to meet the Court's construction of "spread spectrum signals." As a result, Linex has not established that there is a disputed issue of fact regarding whether the accused products meet the limitation of "spread spectrum signals." Because, to infringe, the accused products must practice every limitation of the asserted claims, Defendants are entitled to summary judgment of non-infringement of the remaining valid claims.

CONCLUSION

The Court has construed the disputed terms of the asserted claims. Claims 107-109 of the '219 patent and claims 97-98 of the '812 patent are invalid as anticipated by Paulraj. Claims 121, 131-132 of the '219 patent and claims 101-102 of the '812 patent are valid, but are not infringed by the accused devices. The Clerk of the Court shall enter judgment in favor of Defendants, who shall recover their costs from Linex.

IT IS SO ORDERED.

Dated: 5/20/2014

CLAUDIA WILKEN
United States District Judge