**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TYLER DIVISION**

WI-LAN INC.,	§ § §	
Plaintiff,	§ §	
vs.	§ §	**CASE NO. 6:10-CV-521**
ALCATEL-LUCENT USA INC., ET AL.,	§ § § §	
Defendants.	§ §	

MEMORANDUM OPINION AND ORDER

This Memorandum Opinion construes the disputed claim terms in U.S. Patent Nos.

6,088,326 ("the '326 Patent"); 6,381,211 ("the '211 Patent"); 6,222,819 ("the '819 Patent"); and

6,195,327 ("the '327 Patent"). Further, after reviewing the briefing and arguments relating to

Alcatel-Lucent USA Inc. and the Ericsson Defendants' Motion for Partial Summary Judgment

That Patent Claims Are Indefinite (Docket No. 174), the Court **ORDERS** that the motion is

DENIED.

BACKGROUND

Wi-LAN Inc. ("Wi-LAN") alleges that Alcatel-Lucent USA Inc.; Ericsson Inc.; Exedea

Inc.; HTC America, Inc.; HTC Corporation; LG Electronics Mobilecomm U.S.A., Inc.; LG

Electronics U.S.A., Inc.; LG Electronics, Inc.[1]; Sony Mobile Communications (USA) Inc.; Sony

Mobile Communications AB; and Telefonaktiebolaget LM Ericsson (collectively "Defendants")

each infringe one or more of the patents-in-suit, which relate to wireless communication links

between a subscriber terminal and a central terminal. The patents address the need to, within a

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[1] The three LG defendants are no longer involved in the case.

given frequency range, increase the number of supported subscriber terminals while reducing the interference between the wireless links. Three of the patents—the '326, '819, and '327 Patents—were filed on the same day and claim priority to the same foreign-filed application. These three patents are not formally related, though they share substantially similar specifications. The '211 Patent is a continuation of the '326 Patent.

The '326, '211, and '819 Patent claims relate to using combinations of time division multiplexing (TDM) techniques, code division multiple access (CDMA) techniques, and overlay codes to increase the number of wireless links that can operate in a given frequency band. The '327 Patent claims relate to detecting interference between cells of a CDMA system and reducing the number of channels used in that cell to lessen the interference effects.

APPLICABLE LAW

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

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

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *see also Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* Also, the specification may resolve ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex, Inc.*, 299 F.3d at 1325. But, "'[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.'" *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *see also Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent.").

Although extrinsic evidence can be useful, it is "'less significant than the intrinsic record in determining the legally operative meaning of claim language.'" *Phillips*, 415 F.3d at 1317 (quoting *C.R. Bard, Inc.*, 388 F.3d at 862). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition is entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

The patents-in-suit also contain a means-plus-function limitation that requires construction. Where a claim limitation is expressed in means-plus-function language and does not recite definite structure in support of its function, the limitation is subject to 35 U.S.C. § 112 ¶ 6. *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). In relevant part, 35 U.S.C. § 112 ¶ 6 "mandates that such a claim limitation 'be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.'" *Id.* (quoting 35 U.S.C. § 112 ¶ 6). Accordingly, when faced with means-plus-function limitations, courts

"must turn to the written description of the patent to find the structure that corresponds to the means recited in the [limitations]." *Id.*

Construing a means-plus-function limitation involves multiple inquiries. "The first step in construing [a means-plus-function] limitation is a determination of the function of the means-plus-function limitation." *Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1311 (Fed. Cir. 2001). Once a court has determined the limitation's function, "[t]he next step is to determine the corresponding structure described in the specification and equivalents thereof." *Id.* A "structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Braun*, 124 F.3d at 1424.

Defendants also contend that some claims at issue are invalid for indefiniteness. A claim is invalid under 35 U.S.C. § 112 ¶ 2 if it fails to particularly point out and distinctly claim the subject matter that the applicant regards as the invention. The party seeking to invalidate a claim under 35 U.S.C. § 112 ¶ 2 as indefinite must show by clear and convincing evidence that one skilled in the art would not understand the scope of the claim when read in light of the specification. *Intellectual Prop. Dev., Inc. v. UA-Columbia Cablevision of Westchester, Inc.*, 336 F.3d 1308, 1319 (Fed. Cir. 2003).

CLAIM TERMS

subscriber terminal

Wi-LAN proposes "user equipment." Defendants propose "a fixed-location device." The primary dispute is whether a subscriber terminal is fixed or mobile. The parties also dispute whether the term, when appearing only in the preamble of a claim, is a limitation of the claim.

Fixed vs. Mobile

Defendants argue that the subscriber terminal of the patents-in-suit is a fixed location device because that is how it is defined in the specification and the term had no customary or ordinary meaning at the time of the invention. Figure 1 of the '326 Patent depicts "a schematic overview of an example of a wireless telecommunications system." '326 Patent col. 6:32–33. The figure includes a public switched telephone network, three central terminals, and three to four subscriber terminals per central terminal. The detailed description explains that the "subscriber terminals 20 [are] at fixed locations." *Id.* col. 6:62–63. Based on these disclosures and the fact that the specification fails to mention mobile devices, Defendants argue that a subscriber terminal is a fixed location device.

Wi-LAN argues that Defendants seek to import a limitation from a preferred embodiment into the claims. Wi-LAN first notes that the discussion of Figure 1 clarifies that it is only presented as an example. *See id.* col. 6:32. Wi-LAN contends that the focus of the invention was on the "techniques for processing data transmitted and received over a wireless link," not whether the subscriber terminal was mobile or fixed. *Id.* col. 1:8–12. Wi-LAN further asserts that one of skill in the art at the time of the invention would have understood subscriber terminal to include both fixed-location and mobile devices. To support this contention, Wi-LAN cites to three patents filed in the early 1990s that recognize subscriber terminal as including mobile devices. *See* Docket No. 182, at 2.

While a preferred embodiment reveals a fixed-location device operating as a subscriber terminal, nothing in the claims or specification suggests that subscriber terminal should be limited to a fixed-location device. A person of skill in the art at the time of the invention would have recognized that a subscriber terminal for wireless communications could be either a fixed-

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location device or a mobile device. Because the patentee did not act as his own lexicographer or

disavow claim scope, the term subscriber terminal shall include both fixed-location and mobile

devices.

Preamble Limitations

As a general rule, the preamble is not considered a limitation for a claim. *Am. Med. Sys.*

v. Biolitec, Inc., 618 F.3d 1354, 1358 (Fed. Cir. 2010). "Nonetheless, the preamble may be

construed as limiting 'if it recites essential structure or steps, or if it is necessary to give life,

meaning, and vitality to the claim.'" *Id.* (quoting *Catalina Mktg. Int'l, Inc. v. Coolsavings.com,*

Inc., 289 F.3d 801, 808 (Fed. Cir. 2002)). The preamble is not considered limiting if the claims

recite a structurally complete invention. *Id.* at 1358–59.

Several claims of the patents-in-suit contain the term "subscriber terminal" in the

preamble but not in the specific limitations of the claim.[2] Defendants contend that the preamble

of these claims should be limiting because it gives life to the meaning of the claims and provides

antecedent basis for terms in the claim limitations. Wi-LAN argues that the preamble,

particularly the term "subscriber terminal," should not be limiting because the claims are

structurally complete without the preamble. Further, Wi-LAN argues that the preamble merely

describes the purpose or intended use of the invention.

Claim 1 of the '326 Patent is representative and its preamble states: "A transmission

controller for processing data items to be transmitted over a wireless link connecting a central

terminal and a subscriber terminal of a wireless telecommunications system, *a single frequency*

channel being employed for transmitting data items pertaining to a plurality of wireless links, the

transmission controller comprising . . . ." '326 Patent col. 28:22–27 (emphasis added). At first

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[2] These claims include claim 1 of the '326 Patent; claim 1 of the '211 Patent; claims 1 and 12 of the '819 Patent; and claims 1, 11, 13, 15, 17, and 19 of the '327 Patent.

blush, it appears that the preamble is merely describing the purpose of the invention. However, the second phrase, beginning with "a single frequency channel," goes beyond merely describing the invention. This phrase provides the antecedent basis for "the single frequency" used later in the claim limitations. Because the preamble provides this clarification, it gives life to the claims and should be considered limiting.

Even if the preamble were not considered limiting, the agreed construction for "wireless link" introduces the subscriber terminal limitation into the disputed claims. The parties have agreed that "wireless link" means "a radio connection between a central terminal and a particular subscriber terminal for communicating data items therebetween." *See* Docket No. 192 Attach. 1, at 1. Each of the preamble claims at issue recites "wireless links" in its body. Therefore, the subscriber terminal limitation is introduced as a limitation by the parties' agreed construction for wireless link.

The Court, having resolved the parties' disputes, finds that the term "subscriber terminal" does not require construction.

orthogonal channel/orthogonal channels

Wi-LAN proposes that "orthogonal channels" be construed as "a set of channels created using orthogonal codes that cross-correlate to zero with respect to each other." Wi-LAN proposes that an "orthogonal channel" is "one of the set of orthogonal channels." Defendants propose that "orthogonal channel" be construed as "a communication channel defined by an orthogonal code."[3] Prior to the *Markman* hearing, the parties agreed to the following construction for "orthogonal channels": "a set of channels created using orthogonal codes." *See*

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[3] The parties also agreed that orthogonal codes are "codes that cross-correlate to zero with respect to each other." *See* Docket No. 192 Attach. 2.

Docket No. 192 Attach. 2. In light of this agreed construction, the parties no longer dispute the interpretation of "orthogonal channel."

time division multiplexing (TDM) techniques

Wi-LAN proposes "techniques for allocating an interval of time within a predetermined frame period to a data item, based on one or more characteristics associated with the data item." Defendants propose "methods in which a communication channel is shared among multiple wireless links by allowing each to use the channel for a given period of time in a defined, repeated sequence." The crux of the dispute is whether TDM techniques require the allocation of time slots in a "defined, repeated sequence."

Wi-LAN argues that TDM techniques should not be limited to allocating a defined, repeated sequence of time slots for transporting data items over a channel because neither the specification nor the claims so limit the techniques. Wi-LAN first notes that the specification teaches allocating time slots differently across different channels based on factors such as the type of data being transmitted. *See* '326 Patent col. 3:59–63 (recognizing that channels "can be subdivided differently to yield differing numbers of time slots per frame period"). Wi-LAN also highlights that demand-based access is disclosed "so that the number of subscribers which can be supported exceeds the number of available wireless links." *Id.* col. 6:66–7:2. Wi-LAN argues that the subscriber terminals are constantly reserving and releasing channels as needed. Thus, Wi-LAN continues, as channels are reserved and released to meet subscriber terminal needs, so too are time slots allocated and released on the respective channels. Wi-LAN contends that requiring time slots to be allocated in a defined, repeated sequence would read out this preferred embodiment.

Defendants respond that time division multiplexing techniques, at the time of the invention, were understood to allocate time slots in a defined, repeated sequence. For support,

Defendants cite various technical dictionaries and claim constructions issued by this Court in unrelated cases. *See* Docket No. 175, at 13–15. Defendants also argue that the specification supports their proposed construction because it discloses that channels may be divided to operate at full rate (160 kb/s), half rate (80 kb/s), or quarter rate (40 kb/s). *See* '326 Patent Fig. 15A. Defendants contend that the rate designations imply that time slots are allocated in a defined, repeated sequence; otherwise, Defendants argue, the desired transfer rate would not be achieved.

The parties agree that TDM techniques are understood by one of skill in the art to partition a channel into time slots so that multiple subscribers can utilize the channel during a given frame period. Defendants seek to impose an additional limitation on this partitioning, requiring it to only create "defined, repeated" time slots. Their primary support is extrinsic evidence. However, Wi-LAN also presented extrinsic evidence showing that one of skill in the art would have recognized that TDM techniques could allocate time slots dynamically. *See* Docket No. 182, at 6 (quoting a 1989 *Computer World* article). Extrinsic evidence can be of use for claim construction. *See Phillips*, 415 F.3d at 1317–18. Here, the extrinsic evidence reveals that one of skill in the art would understand TDM techniques to encompass a broad array of techniques for dividing a channel into time slots.

Further, the specification repeatedly teaches the flexibility of the invention, including the allocation of channels and bandwidth within those channels. *See, e.g.*, '326 Patent col. 3:56–63 ("[T]he channelisation means also determines . . . how many time slots will be provided within each orthogonal channel. This gives a great deal of flexibility in how channels are used . . . , and those which are subdivided can be subdivided differently to yield differing numbers of time slots per frame period."); *id.* col. 11:28–30 ("The manner in which the enhancements have been implemented provides flexibility in the way the frequency channels are configured . . . ."); *id.*

col. 18:44–45 ("[T]he channel structure is flexible . . . ."). The specification envisions demand-based access that allows the bandwidth provided to a subscriber terminal to meet the needs of that terminal. *See id.* col. 18:65–67 (recognizing that a user may be authorized to use an entire channel for data-intensive fax transmissions). The specification and claims themselves do not limit TDM techniques to partitioning based on "defined, repeated" divisions. Instead, the specification discusses that the invention can be used flexibly to address the individual needs of subscriber terminals on demand. Based on the specification and supported by the extrinsic evidence of how one of skill in the art would understand TDM techniques, the Court finds that the allocation of time slots need not be in a "defined, repeated sequence."

The Court construes "time division multiplexing (TDM) techniques" as "techniques for allocating an interval of time within a predetermined frame period to a data item, based on one or more characteristics associated with the data item."

time slot

Wi-LAN proposes "an interval of time." Defendants propose "a period of time during which a single wireless link is permitted to use a shared communication channel."

Wi-LAN opposes Defendants' construction for two reasons. First, it suggests that only one wireless link may communicate at any given time in a communication channel. Second, it adds unnecessary context that is already provided by the claim language. As to the first point, Wi-LAN notes that a shared communication channel may be divided using CDMA codes to create a set of orthogonal channels. Then, within this set of channels, TDM techniques may be applied to support additional wireless links. While communications within the set of orthogonal channels may be simultaneous, communication within an orthogonal channel that has been partitioned using TDM techniques is not simultaneous. A frame of communication within the TDM-partitioned channel may contain multiple speakers (i.e., one per time slot), but only one

speaker is speaking at a given time within that frame. At the *Markman* hearing, Defendants clarified that they were interpreting "shared communication channel" in their proposed construction to mean "orthogonal channel."

As to their second objection, raised primarily at the *Markman* hearing, Wi-LAN argued that the context for time slot was provided by the surrounding claim language; therefore, the context provided by Defendants' proposal is unnecessary. The relevant context from claim 1 states: "a TDM encoder arranged to apply time division multiplexing (TDM) techniques to the data item in order to insert the data item within a time slot of the orthogonal channel." '326 Patent col. 28:39–45. Wi-LAN argues that this context is sufficient.

Defendants' proposal is more likely to confuse than to clarify. It mentions a "shared communication channel," while the patent envisions multiples types of channels. There is a single frequency band that is shared. This band may be divided into orthogonal channels that may be further shared. Finally, these orthogonal channels may be further divided using either TDM techniques or additional overlay codes. Thus, a jury may be confused about which channel the "shared communication channel" is referring to, while the claim language dictates that this is "a time slot of the orthogonal channel." The term does not require Defendants' proposed additional context; the claim language itself provides sufficient context.

The court construes "time slot" as "an interval of time."

TDM encoder

Wi-LAN originally proposed "hardware or software for applying TDM techniques"; however, in its reply brief it proposed "hardware and/or software for applying TDM techniques." Defendants propose "a device that applies time division multiplexing (TDM) techniques to share a communication channel among multiple wireless links." At the *Markman* hearing, Defendants

agreed to Wi-LAN's updated proposal. *See* Tr. of *Markman* Hr'g 49, Apr. 26, 2012. The Court construes "TDM encoder" as "hardware and/or software for applying TDM techniques."

TDM decoder

Wi-LAN proposes "hardware and/or software for extracting a data item from a predetermined time slot within the orthogonal channel." Defendants propose "a device used to extract information from a communication channel that is shared among multiple wireless links by allocating a given period of time to each such link in a defined, repeated sequence." At the *Markman* hearing, the parties agreed to the following construction: "hardware and/or software for extracting a data item from a channel that has been encoded using TDM techniques." *See* Tr. of *Markman* Hr'g 50–51, 56, Apr. 26, 2012. The Court construes "TDM decoder" as "hardware and/or software for extracting a data item from a channel that has been encoded using TDM techniques."

overlay code

Wi-LAN proposes "orthogonal codes used to increase the number of orthogonal channels that would otherwise be available." Defendants propose "a second code applied in series with the orthogonal code." Both parties cite the same section of the patent to support their constructions: "By using overlay codes in addition to the known set of orthogonal codes, it is possible for selected orthogonal channels to be subdivided to form additional orthogonal channels." '819 Patent col. 2:54–57.

Wi-LAN argues that "[o]verlay codes are additional orthogonal codes that can be used to subdivide an orthogonal channel to create additional channels." Docket No. 167, at 20. Wi-LAN objects to the "in series" aspect of Defendants' proposal, explaining that neither the specification nor the claims require serial (as opposed to simultaneous) application of the orthogonal codes and overlay codes. Wi-LAN notes that the '819 Patent discloses a simultaneous application of

codes to further refute Defendants' proposal of an "in series" limitation. *See* '819 Patent Fig. 7A (depicting simultaneous application of an RW code from 112 and PN Code from 114 via Spreader 116).

Defendants contend that the ordinary meaning of "overlay" is to "lay over." Thus, the overlay code must be laid over the orthogonal code to further subdivide the channels. Defendants argue that this implies the orthogonal code and overlay code must be applied in series. Defendants also argue that Wi-LAN's proposed construction is equivalent to an orthogonal code and thus strips meaning from the term's modifier, "overlay." Finally, Defendants point out that the preferred embodiments show the overlay code and orthogonal code being applied in series. *See* '819 Patent Fig. 7A (depicting overlay code application at 111 and orthogonal code application at 116).

Defendants' serial requirement is not supported by the specification, which reveals multiple codes being applied simultaneously. Further, one of skill in the art would recognize that such codes can be applied simultaneously via simple mathematical operations. *See* Docket No. 175, at 24 n.12. At the *Markman* hearing, Wi-LAN agreed that an overlay code is an additional code other than the orthogonal code. The parties also both agree that the overlay code further subdivides an orthogonal channel, as described in the specification. Accordingly, the Court construes "overlay code" as "an additional code that subdivides an orthogonal channel."

parameters pertaining to a wireless link within the cell indicative of whether that wireless link is subject to interference from signals generated by other cells

Wi-LAN proposes that the term does not require construction. Defendants propose "two or more indicators that an individual wireless link is experiencing interference from other cells." The parties agree that parameters is plural and relates to two or more parameters. The primary dispute between the parties pertains to the scope of the term "parameters." To use the language

of the parties, the '327 Patent reveals *indicators*, such as Bit Error Rate (BER) and Grade of Service (GOS). These indicators, which relate to the quality of a wireless link, have *values* at any given point in time. The parties disagree over whether "parameters" relates to the indicators or the values for the indicators.

Wi-LAN argues that parameters pertains to the values for indicators. For support, Wi-LAN notes that a preferred embodiment makes the decision to reduce the number of CDMA channels based solely on the BER. *See* '327 Patent col. 25:53–60. Wi-LAN further argues that dependent claims 2 and 3 cover the use of a single indicator for determining whether to reduce the CDMA channel pool. *See id.* col. 30:21–41. Wi-LAN's position is that parameters, which necessarily means two or more, must refer to the values for indicators since certain embodiments and dependent claims envision the use of only one indicator.

Defendants argue that parameters are the indicators rather than their values. Thus, under Defendants' proposal, at least two indicators are required to meet the claim limitation. Defendants object to Wi-LAN's proposal because the specification does not disclose the use of multiple values of a single indicator for making interference determinations. Defendants highlight that the specification reveals an embodiment where two indicators are used to make an interference determination. *See* '327 Patent col. 25:45–53 (describing how BER, GOS, and pool size metrics may be evaluated together by the management system). Thus, Defendants argue that their proposed interpretation is supported by the specification while Wi-LAN's is not.

The specification teaches that the parameters are the indicators rather than the values. The specification describes two parameters: BER and GOS. *See id.* col. 2:29–30 ("[A] parameter provided to the analyser is the bit error rate (BER) . . . ."); *id.* col. 2:45–46 ("[A]n additional parameter preferably provided to the analyser is a grade of service (GOS) signal . . . ."). Thus,

the patent distinguishes between the indicators as parameters as opposed to distinguishing between the values for these indicators.

Though the parties agree that parameters means two or more, the Court finds that the term parameters, as used in the claims, means "one or more." *See Versa Corp. v. Ag-Bag Int'l Ltd.*, 392 F.3d 1325, 1330 (Fed. Cir. 2004) ("[I]n context, the plural can describe a universe ranging from one to some higher number, rather than requiring more than one item."). Claim 1 of the '327 Patent includes an analyzer element "for receiving parameters." '327 Patent col. 30:9. Dependent claims 2 and 3 cover scenarios where a parameter provided to the analyser is BER or GOS respectively. Further, these dependent claims indicate that the channel controller responds to the analyser's evaluation of just that single parameter. *See, e.g.*, *id.* col. 30:27–30 ("the channel controller being responsive to the analyser indicating that the BER exceeds the predetermined maximum acceptable BER to remove a code division multiplexed channel from the channel pool"). Thus, the dependent claims support an interpretation of "parameters" to mean one or more.

A lay jury will readily understand the meaning of this term within the context of the claim language. Thus, the Court finds that no construction is necessary.

channel pool

Wi-LAN proposes that no construction is necessary. Defendants propose "the set of orthogonal channels available to a central terminal to use to establish wireless links." Defendants argue that the term must be construed because Wi-LAN "inten[ds] to ignore the explicit claim language requiring that the channel pool is used to establish wireless ***links***." Docket No. 175, at 28. Defendants' argument strays from the domain of claim construction into the appropriateness of Wi-LAN's purported infringement argument. As Defendants recognize in their argument, the claims require that channel pools include "code division multiplexed channels available for the

establishment of said wireless links." '327 Patent col. 30:7–8. The term "channel pool" is readily understandable as used in the claims. Thus, the Court finds that this term does not require construction.

channelisation means for determining which of the orthogonal channels will be subject to TDM techniques and for transmitting that information to a plurality of subscriber terminals within the wireless telecommunication system

The parties agree that this term is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. Wi-LAN proposes a function of "determining which of the orthogonal channels will be subject to TDM techniques, and transmitting that information to a plurality of subscriber terminals within the wireless telecommunications system." Wi-LAN identifies the following structure:

> A modem shelf including a demand assignment engine connected to a network and one or more modems, the demand assignment engine determining which of the orthogonal channels will be subject to TDM techniques using the algorithm (1) consider whether the subscriber terminal to which data will be transmitted incorporates the features necessary to support TDM techniques; (2) consider the type of data that is to be transmitted in an orthogonal channel; and (3) if the subscriber terminal supports TDM techniques and the data type is one for which TDM techniques should be applied, then apply TDM techniques (otherwise do not), and equivalents thereof.[4]

Defendants contend that the term is indefinite under § 112 for lack of structure. The parties agree that the channelisation means is implemented via software and requires disclosure of an algorithm. *See Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1249 (Fed. Cir. 2005) (explaining that "computer-implemented means-plus-function terms [are restricted] to the algorithm disclosed in the specification").

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[4] Wi-LAN submitted alternate constructions for each of the means-plus-function terms in the joint claim construction chart filed two days before the *Markman* hearing. *See* Docket No. 192 Attach. 1. The Court employs these constructions for each of the means-plus-function terms because they were the primary basis for argument in Wi-LAN's reply brief and at the *Markman* hearing.

TDM Techniques

Wi-LAN contends that the specification reveals an algorithm for determining which orthogonal channels are subject to TDM techniques. The specification notes that there are several considerations in determining whether to apply TDM techniques to an orthogonal channel. First, the algorithm must consider whether the subscriber terminal supports TDM techniques. *See* '326 Patent col. 3:50–55 (indicating that some channels must be reserved for communicating with subscriber terminals to do not support TDM techniques). Second, the algorithm must consider whether TDM techniques are appropriate for the type of data being transmitted. *See id.* cols. 3:56–4:12 (indicating that certain data types (e.g., fax) require more bandwidth and TDM divisions may be inappropriate). Finally, the algorithm must reserve some channels for accomplishing control tasks, and TDM techniques should not be used for those channels. *See id.* col. 4:23–36 (indicating that TDM techniques are not applied to two channels typically reserved for acquisition of wireless links and control of calls); *id.* col. 13:60–62 (indicating that overlay codes are used rather than TDM techniques for downlink control channels). Based on this specification support, Wi-LAN argues that one of skill in the art would understand the algorithm to be: apply TDM techniques to the channel if it is (1) supported by the subscriber terminal and (2) the data being transmitted is deemed appropriate for TDM division.

Defendants argue that the specification fails to disclose a "step-by-step" algorithm revealing how the channelisation means determines which channels are subject to TDM techniques. Defendants also find fault with the specification's disclosure because it involves flexible considerations as opposed to absolute directives.

The patent is directed toward supporting more subscriber terminals on a limited frequency spectrum. *See* '326 Patent col. 1:25–31 ("Due to bandwidth constraints, it is not

practical for each individual subscriber terminal to have its own dedicated frequency channel . . . . Hence, technologies need to be applied to enable data items relating to different wireless links to be passed over the same frequency channel without interfering with each other."). This overarching concern drives the algorithm for determining whether to apply TDM techniques: if TDM techniques can be applied, they should be. The specification identifies several scenarios where TDM techniques should not be applied: (1) when a subscriber terminal does not support TDM techniques; (2) when a channel is reserved for control of call communications; and (3) when subdivision would render an unacceptable data transmission rate for the type of data at issue (e.g., fax). Absent these constraints, TDM techniques should be applied because they "make[] it possible to support more wireless links on one frequency channel." *Id.* col. 5:30–31. "[T]he patent need only disclose sufficient structure for a person of skill in the field to provide an operative software program for the specified function." *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1385 (Fed. Cir. 2011) (citing *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008)). Here, the patent has disclosed sufficient structure for determining whether to apply TDM techniques to a channel.

Transmission

The second portion of the term requires the channelisation means to "transmit[] that information to a plurality of subscriber terminals within the wireless telecommunication system." Defendants do not dispute that the modem shelf is the corresponding structure for transmitting. Defendants dispute whether the channelisation means must be a single structure for both determining whether to apply TDM techniques and transmitting that information to subscribers.

Defendant argue that *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, requires a single structure for means-plus-function terms involving a conjunction of functions. 296 F.3d 1106,

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1115 (Fed. Cir. 2001). In *Cardiac Pacemakers*, the Federal Circuit determined that the limitation

"third monitoring means for monitoring . . .[and] for activating . . ." required the monitoring

means to perform the dual function of monitoring and activating. The dual requirement was

derived from the use of the term *monitoring* to describe both the means and one of the functions.

Here, the term is "channelisation means for determining . . . and for transmitting . . . ." Thus, this

presents a different situation. Further, the *Cardiac Pacemakers* court recognized that a limitation

of this form (a means for doing x and y) may "be ambiguous about whether the limitation

required one means for performing both functions x and y, or simply one means for performing x

and one (potentially different) means for performing function y." *Id.* (citing *Medtronic, Inc. v.*

Advanced Cardiovascular Sys., 248 F.3d 1303, 1313 (Fed. Cir. 2001)). Accordingly, the Court

does not agree that a single structure must be disclosed to perform the determining and

transmitting functions. Even if such a structure were required, Figure 17 of the '326 Patent

reveals a modem shelf 302 that includes both the DA Engine 380 and a modem 320 within a

single structure.

The Court construes the means-plus-function term "channelisation means for determining

which of the orthogonal channels will be subject to TDM techniques and for transmitting that

information to a plurality of subscriber terminals within the wireless telecommunication system"

as follows. The function identified by the term is "determining which of the orthogonal channels

will be subject to TDM techniques and transmitting that information to a plurality of subscriber

terminals within the wireless telecommunication system." The corresponding structure is

revealed in Figure 17 as a modem shelf including the DA (demand assignment) Engine 380 and

modem 320. The structure is: "Figure 17. A modem shelf including a demand assignment engine

connected to a network and one or more modems, the demand assignment engine determining

which of the orthogonal channels will be subject to TDM techniques using the algorithm (1) consider whether the subscriber terminal to which data will be transmitted incorporates the features necessary to support TDM techniques; (2) consider the type of data that is to be transmitted in an orthogonal channel; and (3) if the subscriber terminal supports TDM techniques and the data type is one for which TDM techniques should be applied, then apply TDM techniques (otherwise do not)."

channelisation means for determining, for those orthogonal channels subject to TDM techniques, how many time slots will be provided within each orthogonal channel

The parties agree that this term is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. Wi-LAN proposes a function of "determining, for those orthogonal channels subject to TDM techniques, how many time slots will be provided within each orthogonal channel." Wi-LAN identifies the following structure:

> A demand assignment engine connected to a network and one or more modems, the demand assignment engine determining how many time slots will be provided within each orthogonal channel using the algorithm: (1) consider the type of data that is to be transmitted in an orthogonal channel, and (2) choose a suitable number of time slots to provide within the orthogonal channel to achieve an acceptable data rate, and equivalents thereof.

Defendants contend that the term is indefinite under § 112 for lack of structure.

Wi-LAN contends that the algorithm determines how many time slots are within an orthogonal channel based on the type of data being transmitted and the transmission rate typically required for that type of data. The specification explains the implications of dividing a 160 kb/s frequency channel. *See* '326 Patent cols. 3:63–4:12 (explaining that two slots would support 80 kb/s per slot and four slots would support 40 kb/s per slot). It further notes that 40 kb/s may not be acceptable for some data transmissions (e.g., fax); thus, a four-slot division would be inappropriate for transmissions of that type.

Defendants argue that these disclosures do not reveal an algorithm for determining the number of slots to create in a divided orthogonal channel. As discussed earlier, the overarching goal is to support more subscriber terminals; thus, more divisions permits more subscribers. However, the specification recognizes that some types of data have bandwidth requirements that place a ceiling on the number of divisions permitted. The specification discloses the importance of determining an acceptable transmission rate for the type of data at issue. Thus, the revealed algorithm is to partition the channel such that it contains the most subdivisions possible while still meeting the minimum transmission requirements for the data type being transmitted.

The Court construes the means-plus-function term "channelisation means for determining, for those orthogonal channels subject to TDM techniques, how many time slots will be provided within each orthogonal channel" as follows. The function is "determining, for those orthogonal channels subject to TDM techniques, how many time slots will be provided within each orthogonal channel." The structure is: "A demand assignment engine connected to a network and one or more modems, the demand assignment engine determining how many time slots will be provided within each orthogonal channel using the algorithm: (1) consider the type of data that is to be transmitted in an orthogonal channel, and (2) choose a suitable number of time slots to provide within the orthogonal channel to achieve an acceptable data rate."

channelisation means for determining which of the orthogonal channels will be subject to overlay codes, and for transmitting that information to a plurality of subscriber terminals

The parties agree that this term is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. Wi-LAN proposes a function of "determining which of the orthogonal channels will be subject to overlay codes, and transmitting that information to a plurality of subscriber terminals within the wireless telecommunications system." Wi-LAN identifies the following structure:

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> A modem shelf including a demand assignment engine connected to a network and one or more modems, the demand assignment engine determining which of the orthogonal channels will be subject to overlay codes using the algorithm: (1) consider whether the subscriber terminal to which data will be transmitted incorporates the features necessary to support overlay codes; (2) consider the type of data that is to be transmitted in an orthogonal channel; and (3) if the subscriber terminal supports overlay codes and the data type is one for which overlay codes should be applied, then apply overlay codes (otherwise do not), and equivalents thereof.

Defendants contend that the term is indefinite under § 112 for lack of structure.

The arguments concerning this term largely mirror those posed for the first means-plus-function term regarding when to apply TDM techniques to a channel. Again, the specification recognizes that some subscriber terminals will not support the use of overlay codes. *See* '819 Patent col. 4:6–11. The specification also teaches that control of call channels typically employ overlay codes as opposed to TDM techniques. *See id.* col. 3:45–50. Finally, the specification teaches the tradeoff between the use of overlay codes to create more sub-channels and loss of effective bandwidth. *See id.* col. 18:4–35 (discussing the use of TDM techniques as illustrated in Figure 15A and overlay codes as illustrated in Figure 15B). Thus, the specification teaches a basic algorithm for determining whether to use overlay codes: if they can be used (considering the subscriber terminals and data being transmitted), then use them to the extent the resultant data rate is acceptable for the type of data being transmitted.

The Court construes the means-plus-function term "channelisation means for determining which of the orthogonal channels will be subject to overlay codes, and for transmitting that information to a plurality of subscriber terminals" as follows. The function is "determining which of the orthogonal channels will be subject to overlay codes and transmitting that information to a plurality of subscriber terminals." The structure is: "Figure 17. A modem shelf including a demand assignment engine connected to a network and one or more modems, the demand assignment engine determining which of the orthogonal channels will be subject to

overlay codes using the algorithm: (1) consider whether the subscriber terminal to which data will be transmitted incorporates the features necessary to support overlay codes; (2) consider the type of data that is to be transmitted in an orthogonal channel; and (3) if the subscriber terminal supports overlay codes and the data type is one for which overlay codes should be applied, then apply overlay codes (otherwise do not)."

<div align="center">**CONCLUSION**</div>

For the foregoing reasons, the Court interprets the claim language in this case in the manner set forth above. Further, Alcatel-Lucent USA Inc. and the Ericsson Defendants' Motion for Partial Summary Judgment That Patent Claims Are Indefinite (Docket No. 174) is **DENIED**. For ease of reference, the Court's claim interpretations are set forth in a table in Appendix A.

So ORDERED and SIGNED this 16th day of May, 2012.

**LEONARD DAVIS
UNITED STATES DISTRICT JUDGE**

APPENDIX A

Claim Term	Court's Construction
subscriber terminal	No construction necessary
orthogonal channels	a set of channels created using orthogonal codes
time division multiplexing (TDM) techniques	techniques for allocating an interval of time within a predetermined frame period to a data item, based on one or more characteristics associated with the data item
time slot	an interval of time
TDM encoder	hardware and/or software for applying TDM techniques
TDM decoder	hardware and/or software for extracting a data item from a channel that has been encoded using TDM techniques
overlay code	an additional code that subdivides an orthogonal channel
parameters pertaining to a wireless link within the cell indicative of whether that wireless link is subject to interference from signals generated by other cells	No construction necessary
channel pool	No construction necessary
channelisation means for determining which of the orthogonal channels will be subject to TDM techniques and for transmitting that information to a plurality of subscriber terminals within the wireless telecommunication system	Function: determining which of the orthogonal channels will be subject to TDM techniques and transmitting that information to a plurality of subscriber terminals within the wireless telecommunication system. Structure: Figure 17. A modem shelf including a demand assignment engine connected to a network and one or more modems, the demand assignment engine determining which of the orthogonal channels will be subject to TDM techniques using the algorithm (1) consider whether the subscriber terminal to which data will be transmitted incorporates the features necessary to support TDM techniques; (2) consider the type of data that is to be transmitted in an orthogonal channel; and (3) if the subscriber terminal supports TDM techniques and the data type is one for which TDM techniques should be applied, then apply TDM techniques (otherwise do not)

Claim Term	Court's Construction
channelisation means for determining, for those orthogonal channels subject to TDM techniques, how many time slots will be provided within each orthogonal channel	Function: determining, for those orthogonal channels subject to TDM techniques, how many time slots will be provided within each orthogonal channel. Structure: A demand assignment engine connected to a network and one or more modems, the demand assignment engine determining how many time slots will be provided within each orthogonal channel using the algorithm: (1) consider the type of data that is to be transmitted in an orthogonal channel, and (2) choose a suitable number of time slots to provide within the orthogonal channel to achieve an acceptable data rate.
channelisation means for determining which of the orthogonal channels will be subject to overlay codes, and for transmitting that information to a plurality of subscriber terminals	Function: determining which of the orthogonal channels will be subject to overlay codes and transmitting that information to a plurality of subscriber terminals. Structure: Figure 17. A modem shelf including a demand assignment engine connected to a network and one or more modems, the demand assignment engine determining which of the orthogonal channels will be subject to overlay codes using the algorithm: (1) consider whether the subscriber terminal to which data will be transmitted incorporates the features necessary to support overlay codes; (2) consider the type of data that is to be transmitted in an orthogonal channel; and (3) if the subscriber terminal supports overlay codes and the data type is one for which overlay codes should be applied, then apply overlay codes (otherwise do not).