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

WI-LAN INC.,	§	
	§	
Plaintiff,	§	
	§	
v.	§	CASE NO. 2:11-CV-68-JRG
	§	
HTC CORP., et al.,	§	
	§	
Defendants.	§	
	§	

MEMORANDUM OPINION AND ORDER

Before the Court are Plaintiff Wi-LAN Inc.'s Opening Claim Construction Brief (Dkt. No. 239), Defendants' response (Dkt. No. 257), and Plaintiff's reply (Dkt. No. 266).

The Court held a hearing on March 21, 2013.

Table of Contents

I. BACKGROUND

Plaintiff asserts United States Patents No. 5,282,222 ("the '222 Patent") and RE37,802 ("the '802 Patent") (collectively, the "patents-in-suit"). The '222 Patent, titled "Method and Apparatus for Multiple Access Between Transceivers in Wireless Communications Using OFDM Spread Spectrum," issued on January 25, 1994, and bears a priority date of March 31, 1992. The '802 Patent, titled "Multicode Direct Sequence Spread Spectrum," issued on July 23, 2002, from a reissue of United States Patent No. 5,555,268, which was a continuation-in-part of the '222 Patent. In general, the patents-in-suit relate to wideband orthogonal frequency-division multiplexing ("W-OFDM"), which is a communication technique for wireless networking.

The patents-in-suit were construed by Judge T. John Ward of this Court in a claim construction order and in a ruling on a motion for reconsideration. *WI-LAN, Inc. v. Acer, Inc.*, No. 2:07-CV-473-TJW, Dkt. No. 469 (E.D. Tex. May 11, 2010) ("*Acer*") (attached to Plaintiff's opening brief as Ex. C); *id.*, Dkt. No. 988 (E.D. Tex. Dec. 30, 2010) ("*Acer Reconsideration*") (attached to Plaintiff's opening brief as Ex. D). As Plaintiff notes, Defendants Apple Inc. ("Apple"), Dell Inc. ("Dell"), and Hewlett-Packard Co. ("HP") were also defendants in *Acer*.

II. LEGAL PRINCIPLES

It is understood that "[a] claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention." *Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed. Cir. 1999). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

To ascertain the meaning of claims, courts look to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. The specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. *Id.* A patent's claims must be read in view of the specification, of which they are a part. *Id.* For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id.* "One purpose for examining the specification is to determine if the patentee has limited the scope of the claims." *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee's invention. Otherwise, there would be no need for claims. *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1388 (Fed. Cir. 1992). Although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994).

This Court's claim construction analysis is substantially guided by the Federal Circuit's decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the court set forth several guideposts that courts should follow when construing claims. In particular, the court reiterated that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To that end, the words

used in a claim are generally given their ordinary and customary meaning. *Id.* The ordinary and customary meaning of a claim term "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1313. This principle of patent law flows naturally from the recognition that inventors are usually persons who are skilled in the field of the invention and that patents are addressed to, and intended to be read by, others skilled in the particular art. *Id.*

Despite the importance of claim terms, *Phillips* made clear that "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.* Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of "a fully integrated written instrument." *Id.* at 1315 (quoting *Markman*, 52 F.3d at 978). Thus, the *Phillips* court emphasized the specification as being the primary basis for construing the claims. *Id.* at 1314-17. As the Supreme Court stated long ago, "in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims." *Bates v. Coe*, 98 U.S. 31, 38 (1878). In addressing the role of the specification, the *Phillips* court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998):

> Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

Phillips, 415 F.3d at 1316. Consequently, *Phillips* emphasized the important role the specification plays in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. Like the specification, the prosecution history helps to demonstrate how the inventor and the Patent and Trademark Office ("PTO") understood the patent. *Id.* at 1317. Because the file history, however, "represents an ongoing negotiation between the PTO and the applicant," it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id.* Nevertheless, the prosecution history is intrinsic evidence that is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims. *Id.*; *see Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (noting that "a patentee's statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation").

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* court condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), that a court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Phillips*, 415 F.3d at 1319-24. According to *Phillips*, reliance on dictionary definitions at the expense of the specification had the effect of "focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent." *Id.* at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id.*

Phillips does not preclude all uses of dictionaries in claim construction proceedings. Instead, the court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the court emphasized that claim construction issues are not resolved by any magic formula. The

court did not impose any particular sequence of steps for a court to follow when it considers disputed claim language. *Id.* at 1323-25. Rather, *Phillips* held that a court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant.

Indefiniteness is a "legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1376 (Fed. Cir. 2001) (citation omitted). A finding of indefiniteness must overcome the statutory presumption of validity. *See* 35 U.S.C. § 282. That is, the "standard [for finding indefiniteness] is met where an accused infringer shows by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on the claim language, the specification, and the prosecution history, as well as her knowledge of the relevant art area." *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249-50 (Fed. Cir. 2008).

> In determining whether that standard is met, i.e., whether the claims at issue are sufficiently precise to permit a potential competitor to determine whether or not he is infringing, we have not held that a claim is indefinite merely because it poses a difficult issue of claim construction. We engage in claim construction every day, and cases frequently present close questions of claim construction on which expert witnesses, trial courts, and even the judges of this court may disagree. Under a broad concept of indefiniteness, all but the clearest claim construction issues could be regarded as giving rise to invalidating indefiniteness in the claims at issue. But we have not adopted that approach to the law of indefiniteness. We have not insisted that claims be plain on their face in order to avoid condemnation for indefiniteness; rather, what we have asked is that the claims be amenable to construction, however difficult that task may be. If a claim is insolubly ambiguous, and no narrowing construction can properly be adopted, we have held the claim indefinite. If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds. . . . By finding claims indefinite only if reasonable efforts at claim construction prove futile, we accord respect to the statutory presumption of patent validity . . . and we protect the inventive contribution of patentees, even when the drafting of their patents has been less than ideal.

Exxon, 265 F.3d at 1375 (citations and internal quotation marks omitted).

In general, prior claim construction proceedings involving the same patents-in-suit are "entitled to reasoned deference under the broad principals of *stare decisis* and the goals articulated by the Supreme Court in *Markman*, even though *stare decisis* may not be applicable *per se*." *Maurice Mitchell Innovations, LP v. Intel Corp.*, No. 2:04-CV-450, 2006 WL 1751779, at *4 (E.D. Tex. June 21, 2006).

III. CONSTRUCTION OF AGREED TERMS

The Court hereby adopts the following agreed constructions:

United States Patent No. 5,282,222	
Term	Agreed Construction
"wideband frequency channels"	"frequency channels with a K (number of points) and a Δf (frequency band) large enough to be able to achieve a specific throughput and large enough to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER (bit error rate)"
"carrier recovery"	"process of determining the carrier phase of the received signal"
"clock recovery"	"process of determining the clock of the received signal"
United States Patent No. RE37,802	
Term	Agreed Construction
"transceiver"	"a device that transmits and receives data"
"spreading"	"distributing data symbols over codes to create a wider bandwidth of data symbols"
"direct sequence spread spectrum codes"	"pseudo random codes over which information bits are spread"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, at 2-3.)

IV. CONSTRUCTION OF DISPUTED TERMS IN THE '222 PATENT

The Abstract of the '222 Patent states:

> A method for allowing a number of wireless transceivers to exchange information (data, voice or video) with each other. A first frame of information is multiplexed over a number of wideband frequency bands at a first transceiver, and the information transmitted to a second transceiver. The information is received and processed at the second transceiver. The information is differentially encoded using phase shift keying. In addition, after a pre-selected time interval, the first transceiver may transmit again. During the preselected time interval, the second transceiver may exchange information with another transceiver in a time duplex fashion. The processing of the signal at the second transceiver may include estimating the phase differential of the transmitted signal and pre-distorting the transmitted signal. A transceiver includes an encoder for encoding information, a wideband frequency division multiplexer for multiplexing the information onto wideband frequency voice channels, and a local oscillator for upconverting the multiplexed information. The apparatus may include a processor for applying a Fourier transform to the multiplexed information to bring the information into the time domain for transmission.

A. "transceiver" (Claims 1-3)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a device that transmits and receives data"	"a device that transmits and receives data without the use of clock recovery, carrier recovery, automatic gain control, passband limiter, power amplifier, an equalizer, and an interleaver-deinterleaver"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '222 Patent, at 1; *id.*, Ex. B, at 1.)

After the close of briefing, the parties reached agreement that the term **"transceiver"** in the '222 Patent should be construed to mean **"a device that transmits and receives data,"** as reflected in the parties' March 7, 2013 P.R. 4-5(d) Joint Claim Construction Chart. (*See* Dkt. No. 285.) The Court hereby adopts the parties' agreed construction.

B. "amplitude and phase differential characteristics" and "the amplitude and the phase differential" (Claim 1)

"amplitude and phase differential characteristics" (Claim 1)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"characteristics of both the amplitude and the difference in phase caused by the wireless channel"	"This phrase is a limitation of the claim" and means "characteristics of both the amplitude and the difference in phase resulting from differential modulation of the received data signals."
"the amplitude and the phase differential" (Claim 1)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"amplitude and difference in phase caused by the wireless channel"	"the amplitude and the difference in phase resulting from differential modulation of the received data signals"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '222 Patent, at 1 & 2; *id.*, Ex. B, at 1.)

After the close of briefing, the parties reached agreement, as reflected in the parties' March 7, 2013 P.R. 4-5(d) Joint Claim Construction Chart (*see* Dkt. No. 285), that the following constructions should be adopted:

Term	Construction
"amplitude and phase differential characteristics"	**"characteristics of both the amplitude and the difference in phase caused by the wireless channel"**
"the amplitude and the phase differential"	**"amplitude and difference in phase caused by the wireless channel"**
"an estimated amplitude and an estimated phase differential"	**"an estimated amplitude and an estimated difference in phase caused by the wireless channel"**

The Court hereby adopts the parties' agreed constructions.

C. "wideband frequency division multiplexer for multiplexing the information onto wideband frequency channels" (Claim 1)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a device that combines the information from multiple inputs into a single output for multiplexing the information onto wideband frequency channels"	"device that employs differential modulation to combine the information from multiple inputs into a single output for multiplexing the information onto wideband frequency channels" Alternative: Indefinite

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '222 Patent, at 3; *id.*, Ex. B, at 1.)

(1) The Parties' Positions

Plaintiff submits that it proposes the construction reached in *Acer*, and Plaintiff argues that "Defendants seek to import 'differential modulation' into 'wideband frequency division multiplexer' . . . ." (Dkt. No. 239, at 10.) Plaintiff also highlights the disclosure of alternatives to differential modulation, such as quadrature amplitude modulation. (*Id.* at 8.) Further, Plaintiff urges that "the teachings in the '222 patent for W-OFDM are applicable to both differential and non-differential modulation/encoding schemes." (*Id.*) Finally, Plaintiff argues that "Defendants' suggestion, in the alternative, that the claim term is indefinite, lacks sufficient foundation, since the *Acer* Court previously had no difficulty construing the term, thereby establishing that it is in fact 'amenable to construction.'" (*Id.*, at 11 (quoting *Exxon*, 265 F.3d at 1375).)

Defendants respond that "'wideband frequency division multiplexer' is a term of art coined by the patentees" and therefore "must be construed as a whole consistent with its definition in the specification." (Dkt. No. 237, at 3.) As to Plaintiff's reliance on disclosure of quadrature amplitude modulation, Defendants respond that the disclosed modulator uses "DPSK (*differential* phase shift keying) symbols or DQAM (*differential* quadrature amplitude

modulated) symbols." (*Id.*, at 4 (citing '222 Patent at 5:30-34 & 9:26-28).) Defendants also argue that the only guidance for determining values for K and Δf are "for systems employing MDPSK (multilevel differential phase shift keying), a form of differential modulation." (*Id.*, at 5 (citing '222 Patent at 6:34-7:10).) Defendants conclude that "[t]he patentee's failure to disclose any standard to determine the values of K and Δf for non-differential modulation necessarily means that, if the claims are construed to cover non-differential modulation as [Plaintiff] suggests, a person of ordinary skill in the art would not be able to ascertain the scope of the invention," and the claims would therefore be invalid as indefinite. (*Id.*, at 5-6.)

Plaintiff replies that *Acer* properly rejected the argument that the specification discloses only differential modulation. (Dkt. No. 266, at 2.) Plaintiff also notes that the disputed term "does not include a 'modulation' term, let alone 'differential modulation.'" (*Id.*, at 3.) As to indefiniteness, Plaintiff reiterates that previous defendants, as well as the Court in *Acer*, were able to construe the disputed term. (*Id.*)

At the March 21, 2013 hearing, Defendants emphasized that *Acer* did not consider Defendants' present argument that for determining values for K and Δf, the specification only provides guidance with regard to differential modulation. Defendants also submitted that to the extent the disputed term is construed to encompass non-differential modulation, Defendants' invalidity argument is not so much one of indefiniteness but rather is really one of lack of enablement. As a matter of claim construction, however, Defendants urged that the scope of the claims should be limited by the scope of disclosure. *See On Demand Machine Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006) ("[T]he claims cannot be of broader scope than the invention that is set forth in the specification."); *see also Phillips*, 415 F.3d at 1416; *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011) ("In

reviewing the intrinsic record to construe the claims, we strive to capture the scope of the actual invention, rather than strictly limit the scope of claims to disclosed embodiments or allow the claim language to become divorced from what the specification conveys is the invention.").

(2) Analysis

In non-differential modulation schemes, sequential data symbols themselves carry the information that is being transmitted or received. In differential modulation schemes, the *difference* between adjacent symbols is used to carry the information. (*See, e.g.,* Dkt. No. 257 at 4 n.3.) The parties disagree on whether the disputed term requires differential modulation and, if not, whether the disputed term renders the claim invalid.

In *Acer*, the Court found that "the terms 'multiplexer' and 'multiplexing' are well known in the art." *Acer* at 21. The Court also found that "one of ordinary skill in the art would understand, in general, orthogonal frequency-division multiplexing as a type of frequency division multiplexing where a number of sub-carriers are used to carry data, wherein the data is divided into several parallel data streams or channels, one for each sub-carrier." *Id.* at 22. *Acer* did not address whether the disputed term requires differential modulation.

Claim 1 of the '222 Patent recites (emphasis added):

> 1. A transceiver including a transmitter for transmitting electromagnetic signals and a receiver for receiving electromagnetic signals having amplitude and phase differential characteristics, the transmitter comprising:
>
> an encoder for encoding information;
>
> *a wideband frequency division multiplexer [f]or multiplexing the information onto wideband frequency channels*;
>
> a low pass filter;
>
> a local oscillator for upconverting the multiplexed information for transmission;
>
> a processor for applying a [F]ourier transform to the multiplexed information to bring the information into the time domain for transmission;
>
> further including, in the receiver of the transceiver[:]
>
> a bandpass filter for filtering the received electromagnetic signals;

> a local oscillator for downconverting the received electromagnetic signals to produce output;
>
> a sampler for sampling the output of the local oscillator to produce sampled signals to the channel estimator;
>
> a channel estimator for estimating one or both of *the amplitude and the phase differential of the received signals* to produce as output one or both of *an estimated amplitude and an estimated phase differential* respectively; and
>
> a decoder for producing signals from the sampled signals and the output from the channel estimator.

The parties have agreed that "wireless frequency channels" means: "frequency channels with a K (number of points) and a Δf (frequency band) large enough to be able to achieve a specific throughput and large enough to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER (bit error rate)." (Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, at 2-3.)

The specification repeatedly refers to differential modulation:

> The frequency bands are selected to occupy a wideband and are preferably contiguous, with the information being *differentially encoded* using phase shift keying.

('222 Patent at 2:63-64 (emphasis added).)

> In this disclosure there will be described two systems as examples of the implementation of the invention. The system described first here will apply to a cellular system with a number of portable transceivers and base stations (BS). Then will be described a local area network implementation.

(*Id.* at 4:64-5:1.)

> Wideband in this patent document is described in the context of Wideband-Orthogonal Frequency Domain Modulation (W-OFDM or wideband OFDM). In OFDM, the entire available bandwidth B is divided into a number of points K, where adjacent points are separated by a frequency band Δf, that is $B=K\Delta f$. The K points are grouped into a frame of K_1 points and two tail slots of K_2 points each, so that $K=K_1+2K_2$. The frame carries the information intended for transmission under the form of multilevel *differential* phase shift keying (MDPSK) symbols or differential quadrature amplitude modulated (DQAM) symbols.

(*Id.* at 5:24-34 (emphasis added).)

In summary, OFDM with a K and a Δf large enough to be able to achieve a specific throughput and large enough to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER is referred to here as Wideband-OFDM.

As an example, let us assume that *MDPSK* is used in an OFDM system with the number M of levels, with a carrier frequency f_c, with a raised cosine pulse of roll-off β, with the LO [(local oscillator)] at the receiver having a frequency offset f_o relative to the LO at the transmitter (so that the frequency offset between the carrier frequencies in the first and second transceivers of the multiplexed information is f_o), with a given maximum expected clock error $\tau=\chi T$ at the receiving transceiver, where T is the duration of one time domain sample, and with a maximum expected relative velocity V between the transceivers. Thus, in order to ensure that the out-of-band signal is ydB or less relative to the in-band signal and to be able to avoid using either a clock or a carrier recovery device without substantially affecting the BER we have to:

1. Find the acceptable sampling error Δf', relative to one symbol sample, which does not substantially affect the BER. This can be done using the following rules:

$$\text{When } 0.2 \leq \beta \leq 0.3, \Delta f' = 7.50\%$$

$$\text{When } 0.3 \leq \beta \leq 0.4, \Delta f' = 10.0\%$$

$$\text{When } 0.4 \leq \beta \leq 0.5, \Delta f' = 12.5\%$$

$$\text{When } 0.5 \leq \beta \leq 0.6, \Delta f' = 15.0\%$$

2. Find Δf such that:

$$V/(\lambda\Delta f) + f_o/\Delta f \leq \Delta f'$$

3. Find K_2 such that

$$20.\log_{10}|P(f)/P(0)| \leq y \text{ for } f \geq K_{2\sigma f}$$

4. Find K_1 such that

$$2\pi\chi/K_1 < \pi/M$$

In this case, we refer to OFDM as Wideband-OFDM. Element 4 is a necessary condition for wideband OFDM, and given a sampling error, the sampling error may be corrected with the methods described in this patent document.

To implement wideband modulation, Orthogonal Frequency Division Multiplexing (OFDM) is preferred in which the information, for example encoded speech, is multiplexed over a number of contiguous frequency bands. Wideband OFDM forces the channel to be frequency selective and causes two types of linear

> distortion: amplitude distortion and phase distortion. To reduce the effect of amplitude distortion the modulation is preferably *phase modulation*, while the effect of phase distortion is reduced by employing *differential phase modulation*. Hence the modulation may be referred to as *Differential OFDM (DOFDM)*. Unlike in other proposed schemes, neither pilot tones nor diversity are required in DOFDM. Possibly, quadrature amplitude modulation might be used, but amplitude modulation makes it difficult to equalize the distorting effects of the channel on the signal.

(*Id.* at 6:30-7:27 (emphasis added).)

> The bits are provided to the modulator 512 which turns them into D8PSK symbols, with three bits per symbol.

(*Id.* at 9:26-28 ("D8PSK" refers to a particular differentially-modulated form of phase shift keying, *see id.* at 7:33-38).)

> For wireless LAN, *wideband differential orthogonal frequency division multiplexing* is again employed.

(*Id.* at 17:11-12 (emphasis added).)

The disputed term, however, does not refer to differential modulation, and the claim does not suggest that the use of differential modulation as opposed to non-differential modulation is of any relevant consequence. Claim 1 refers to the "amplitude and the phase differential of the received signals," but as discussed in the *Acer Reconsideration*, and as now agreed upon by the parties here (*see* Section IV.B., above), those recited "differentials" are properties of the communication channel rather than of the modulation technique. *See Acer Reconsideration* at 5-10. Further, the illustration of "D8PSK" ("Differential Eight Phase Shift Keying," *see* '222 Patent at 7:33-38) in Figures 5a, 5b, 13a & 13b does not demand that all embodiments must use differential modulation. *See MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir. 2007) (noting that "patent coverage is not necessarily limited to inventions that look like the ones in the figures"). On balance, the use of differential modulation is a feature of

preferred embodiments and should not be imported into the disputed term here at issue. *Electro Med.*, 34 F.3d at 1054.

Finally, as to Defendants' indefiniteness argument, although the claims must be construed in light of the specification, the adequacy of the patent disclosure is generally an issue of validity, not claim construction. *Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction."). Defendants appeared to acknowledge as much at the March 21, 2013 hearing and have failed to meet their burden to demonstrate that the disputed term is not "amenable to construction." *Exxon*, 265 F.3d at 1375.

The Court therefore hereby construes **"wideband frequency division multiplexer for multiplexing the information onto wideband frequency channels"** to mean **"a device that combines the information from multiple inputs into a single output for multiplexing the information onto wideband frequency channels."**

D. "points"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"divisions of a wideband frequency channel" Alternatively: "sub-carriers"	"divisions within the frequency band"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '222 Patent, at 3; *id.*, Ex. B, at 1; Dkt. No. 239, at 13.)

The term "points" is not found in the language of the asserted claims. The term appears within the agreed construction of "wideband frequency channels," which is set forth in Section III., above.

After the close of briefing, the parties reached agreement that the term **"points"** should be construed to mean **"divisions of a frequency channel,"** as reflected in the parties' March 7, 2013 P.R. 4-5(d) Joint Claim Construction Chart. (*See* Dkt. No. 285.) The Court hereby adopts the parties' agreed construction.

E. "channel estimator for estimating one or both of the amplitude and the phase differential of the received signal to produce as output one or both of an estimated amplitude and an estimated phase differential respectively" (Claim 1)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
The term "channel estimator" means "a device that estimates the effect of the channel on the transmitted signals." Apart from the construction of "channel estimator" and the "amplitude" and "phase differential" terms, further construction is not necessary. This limitation is not governed by § 112(6).	Means-plus-function under 35 U.S.C. § 112, ¶ 6 Function: "estimating one or both of the amplitude and the phase differential of the received signals to produce as output one or both of an estimated amplitude and an estimated phase differential respectively" Corresponding Structure: "the schematic shown in Figs. 7a and 15 and the algorithm as described in Fig. 7b and col. 10:57-col. 12:12"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '222 Patent, at 4-5; *id.*, Ex. B, at 2-3.)

At the March 21, 2013 hearing, the parties agreed that the disputed term is not governed by 35 U.S.C. § 112, ¶ 6 and that the Court should construe the term to have its plain meaning.

The Court adopts the parties' agreement and hereby construes **"channel estimator for estimating one or both of the amplitude and the phase differential of the received signal to produce as output one or both of an estimated amplitude and an estimated phase differential respectively"** to have its **plain meaning**.

F. "Fourier transform" (Claims 1 and 2), "processor for applying a Fourier transform to the multiplexed information to bring the information into the time domain for transmission" (Claim 1), and "deprocessor for applying an inverse Fourier transform to the samples output from the sampler" (Claim 2)

"Fourier transform" (Claims 1 & 2)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary Alternatively: "a mathematical function for converting between the time domain and frequency domain"	"a mathematical function for converting from the time domain to the frequency domain"
"processor for applying a Fourier transform to the multiplexed information to bring the information into the time domain for transmission" (Claim 1)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary	Indefinite
"deprocessor for applying an inverse Fourier transform to the samples output from the sampler" (Claim 2)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary	Indefinite

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '222 Patent, at 4 & 5; *id.*, Ex. B, at 1-2 & 3; Dkt. No. 239, at 18; Dkt. No. 257, at 7.)

(1) The Parties' Positions

Plaintiff argues that the "processor" phrase "plainly calls for a Fourier transform to convert multiplexed information from the frequency domain into the time domain so that it can be transmitted." (Dkt. No. 239, at 16.) Plaintiff argues that Defendants' proposed construction is "directly contrary to the claim language because the claim language points in the opposite direction: from the frequency domain *to the time domain*." (*Id.*, at 17.) Plaintiff further explains that "the phrase 'a Fourier transform' is used generically as a transform that works to transform

information in either direction, from the frequency domain to the time domain, and vice versa." (*Id.*, at 18.)

Defendants respond that "[a] Fourier transform (otherwise known as a fast or forward Fourier transform) is a well known mathematical function that converts data from the time domain to the frequency domain. An inverse Fourier transform (the opposite of a Fourier transform) converts data from the frequency domain to the time domain." (Dkt. No. 257, at 7 (citations omitted).) Defendants cite various extrinsic sources for support but also emphasize that "Claim 2 of the '222 Patent recites 'a deprocessor for applying an *inverse Fourier transform* to the samples output from the sampler." (*Id.*, at 8 (emphasis Defendants').) Defendants argue that "claim 2 demonstrates that the patentees understood the difference between a Fourier transform and an inverse Fourier transform." (*Id.*) Defendants conclude that "[i]f the 'Fourier transform' of claim 1 is interpreted to include an inverse Fourier transform, this would result in a situation where the processor and deprocessor would both be applying an inverse Fourier transform," in which case the deprocessor would be unable to decode the data. (*Id.*, at 8-9.)

Defendants argue that the "processor . . ." term is indefinite because when Defendants' definition of "a Fourier transform" is inserted into Claim 1, "the claim becomes internally inconsistent and nonsensical: 'applying [a mathematical function for converting from the time domain to the frequency domain] to the multiplexed information to bring the information into the time domain for transmission.'" (*Id.*, at 9 (square brackets in original).)

Plaintiffs reply that "forward and inverse Fourier transforms are both 'Fourier transforms'" and that "because Claim 1 specifies that the Fourier transform is converting information 'into the time domain[,] [i]t therefore is abundantly definite as to what specific Fourier transform applie[s]." (Dkt. No. 266, at 5.)

At the March 21, 2013 hearing, Plaintiff noted that although "Fourier transform" has a well-understood plain meaning to persons of ordinary skill in the art, Plaintiff is not opposed to construing the term. Plaintiff re-urged that the term "inverse Fourier transform" in Claim 2 does not specify a particular direction of the transform (that is, from frequency domain to time domain or vice versa) but rather merely specifies that the Fourier transform in Claim 2 is the opposite of, and therefore undoes, the Fourier transform recited in Claim 1. Plaintiff cited the canon that claims should be construed to uphold their validity, and Plaintiff also noted that the constituent term "inverse" is not capitalized in Claim 2, thus indicating a generic meaning rather than the special meaning argued by Defendants. Plaintiff further argued that Claim 2 should not be used to limit the plain, generic language used in Claim 1. *See O.I. Corp. v. Tekmar Co., Inc.*, 115 F.3d 1576, 1582 (Fed. Cir. 1997) ("[T]he doctrine [of claim differentiation] cannot alter a definition that is otherwise clear from the claim language, description, and prosecution history.").

Defendants responded that the Court should apply the clear, plain language of the claims, especially as to Claim 2. *See Wright Med. Tech., Inc. v. Osteonics Corp.*, 122 F.3d 1440, 1445 (Fed. Cir. 1997) ("[W]e must not interpret an independent claim in a way that is inconsistent with a claim which depends from it."); *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1375 (Fed. Cir. 2004) ("[W]e have repeatedly declined to rewrite unambiguous patent claim language.").

(2) Analysis

Acer did not address the disputed terms here at issue.

As to "Fourier transform," although Plaintiff proposes that no construction is required, the parties have presented a "fundamental dispute regarding the scope of a claim term," and the Court has a duty to resolve that dispute. *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521

F.3d 1351, 1362-63 (Fed. Cir. 2008). Further, a construction of this technical term would be helpful to the finder of fact. *See TQP Dev., LLC v. Merrill Lynch & Co., Inc.*, No. 2:08-CV-471, 2012 WL 1940849, at *2 (E.D. Tex. May 29, 2012) (Bryson, J.) ("The Court believes that some construction of the disputed claim language will assist the jury to understand the claims.").

Claims 1 and 2 of the '222 Patent recite (emphasis added):

> 1. A transceiver including a transmitter for transmitting electromagnetic signals and a receiver for receiving electromagnetic signals having amplitude and phase differential characteristics, the transmitter comprising:
> an encoder for encoding information;
> a wideband frequency division multiplexer [f]or multiplexing the information onto wideband frequency channels;
> a low pass filter;
> a local oscillator for upconverting the multiplexed information for transmission;
> *a processor for applying a* [*F*]*ourier transform to the multiplexed information to bring the information into the time domain for transmission;*
> further including, in the receiver of the transceiver[;]
> a bandpass filter for filtering the received electromagnetic signals;
> a local oscillator for downconverting the received electromagnetic signals to produce output;
> a sampler for sampling the output of the local oscillator to produce sampled signals to the channel estimator;
> a channel estimator for estimating one or both of the amplitude and the phase differential of the received signals to produce as output one or both of an estimated amplitude and an estimated phase differential respectively; and
> a decoder for producing signals from the sampled signals and the output from the channel estimator.
>
> 2. The transceiver of claim 1 further including, in the receiver of the transceiver:
> *a deprocessor for applying an inverse Fourier transform to the samples output from the sampler.*

The claims thus recite that "a Fourier transform" is applied by the transmitter and "an inverse Fourier transform" is applied by the receiver. The Background and Summary of the Invention similarly discloses:

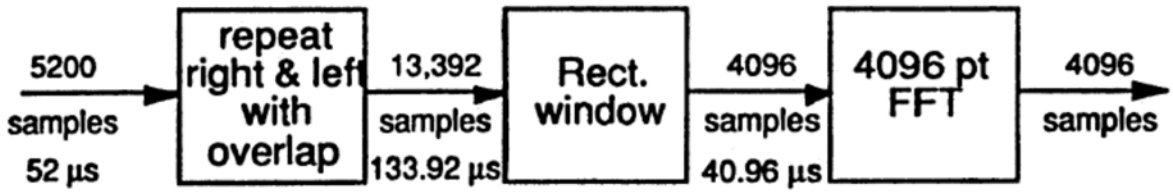
> The apparatus may include a processor for applying a Fourier transform to the multiplexed information to bring the information into the time domain for transmission.

('222 Patent at 3:29-32.)

By contrast, Figures 6a and 6b illustrate that the "processor" at the transmitter can use an "IFFT" (Inverse Fast Fourier Transform) and the "de-proce[]ssor" at the receiver can use an "FFT" (Fast Fourier Transform). (*See id.* at 12:28-31.) Figures 14a and 14b are similar. Figures 6a and 6b are reproduced here:

Procecessor

Fig. 6a



De-procecessor

Fig. 6b

The specification explains, referring to Fig. 6a:

> The *processor* first *inverse Fourier transforms* the 4096 D8PSK modulated symbols output from the modulator. . . . In other words, the processor takes D8PSK symbols in, pulse shapes them and *inverse Fourier transforms* them. On the other hand, *the deprocessor undoes what the processor did*, i.e. it removes the pulse shaping, then *Fourier transforms* the received signal to obtain the original D8PSK symbols.

(*Id.* at 10:24-42.)

In order to harmonize the above-cited claim language, Summary of the Invention, and Figures, the term "Fourier transform" in Claim 1 should be construed generically so as to refer to "converting between the time domain and frequency domain" rather than to converting from the time domain to the frequency domain or vice versa. This interpretation, based on the above-cited intrinsic evidence, is further supported by the opinions of Plaintiff's expert, Dr. Alexander Haimovich. (*See* Dkt. No. 239, Ex. F, 1/10/2013 Haimovich Decl., at pp. 25-26, ¶¶ 77-83; *see also* Dkt. No. 266, Ex. N, 1/31/2013 Haimovich Decl.).[1]

As to the "processor . . ." term in Claim 1, general legal principles regarding indefiniteness are discussed in Section II., above. Although Defendants argue that the claims are "internally inconsistent and nonsensical" (Dkt. No. 257, at 9), the claim language explains the type of conversion that is performed by the Fourier transform. Defendants' indefiniteness argument is therefore hereby expressly rejected as to Claim 1.

Defendants' indefiniteness argument having thus been rejected, no further construction is required as to the "processor" terms. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro*, 521 F.3d at 1362 ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *cf. Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction.").

[1] At the March 21, 2013 hearing, the parties also addressed portions of Richard C. Dorf, *The Electrical Engineering Handbook: Circuits, Signals, and Speech and Image Processing* (3d ed. 2006), in particular the section title "Fourier Transforms" and the content of Table 14.2. On balance, this evidence is not sufficiently clear to be of significant weight one way or the other.

As to the "deprocessor . . ." term in Claim 2, however, the recited phrase "inverse Fourier transform" refers to transformation into the time domain, as is evident from the specification, the figures, the extrinsic textbook excerpts provided by Defendants, and the opinions of Plaintiff's own expert. (*See* '222 Patent at 10:24-42 & Figs. 6a, 6b, 14a & 14b; Dkt. No. 257, Ex. C, Clare D. McGillem and George R. Cooper, *Continuous and Discrete Signal and System Analysis* 111, 113 (1991); *id.*, Ex. E, Donald Christiansen, *Electronics Engineers' Handbook* 2.31 (4th ed. 1997); Dkt. No. 239, Ex. F, 1/10/2013 Haimovich Decl., at p. 5, ¶ 15 ("The output of the IFFT, i.e., the transmitted signal, is said to be in the *time domain*.") & p. 25, ¶ 80 ("It is my opinion that one of skill in the art would know that the inverse Fourier transform is typically used to convert from the frequency domain into the time domain . . . ."). The Court hereby expressly rejects Plaintiff's argument that the constituent term "inverse" in Claim 2 refers to the opposite of whatever Fourier transform is applied in Claim 1.

At the March 21, 2013 hearing, Plaintiff agreed that if "inverse Fourier transform" refers to transformation into the time domain (rather than to the opposite of the Fourier transform that is applied in Claim 1), then Claim 2 is invalid as indefinite. The Court agrees with Plaintiff's candid assessment of the effect of the Court's finding in this regard. The Court therefore hereby finds that the "deprocessor . . ." term renders Claim 2 invalid as indefinite.

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

Term	Construction
"Fourier transform" (Claims 1 & 2)	**"a mathematical function for converting between the time domain and frequency domain"**
"processor for applying a Fourier transform to the multiplexed information to bring the information into the time domain for transmission" (Claim 1)	**No construction is necessary apart from the Court's construction of "Fourier transform."**
"deprocessor for applying an inverse Fourier transform to the samples output from the sampler" (Claim 2)	**This term renders Claim 2 invalid as indefinite.**

V. CONSTRUCTION OF DISPUTED TERMS IN THE '802 PATENT

Plaintiff states that the '802 Patent relates to W-OFDM and, in particular, to "Direct Sequence Spread Spectrum (DSSS), which is a communications scheme in which information is spread over code bits of an invertible code." (Dkt. No. 239, at 18 (citing '802 Patent at 1:21-27).) These "code bits" that make up a code are referred to as "chips." Plaintiff explains that multiple codes can be used at the same time to improve throughput, which is a technique that the '802 Patent refers to as "Multi-Code Direct Sequence Spread Spectrum (MC-DSSS)." (*Id.*, at 19.) Plaintiff submits that "[t]he patented W-OFDM system of the '222 patent is included in the '802 patent as one embodiment of an MC-DSSS system." (*Id.*)

The Abstract of the '802 Patent states:

> In this patent, we present MultiCode Direct Sequence Spread Spectrum (MC-DSSS) which is a modulation scheme that assigns up to N DSSS codes to an individual user where N is the number of chips per DSSS code. When viewed as DSSS, MC-DSSS requires up to N correlators (or equivalently up to N Matched Filters) at the receiver with a complexity of the order of N^2 operations. In addition, a non ideal communication channel can cause InterCode Interference (ICI), i.e., interference between the N DSSS codes. In this patent, we introduce new DSSS codes, which we refer to as the "MC" codes. Such codes allow the information in a MC-DSSS signal to be decoded in a sequence of low complexity parallel operations which reduce the ICI. In addition to low complexity decoding

> and reduced ICI[,] MC-DSSS using the MC codes has the following advantages: (1) it does not require the stringent synchronization DSSS requires, (2) it does not require the stringent carrier recovery DSSS requires and (3) it is spectrally efficient.

A. "converter" (Claim 1)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"a device that accepts data symbols in one form or mode and changes the data symbols to another form or mode"	"a serial-to-parallel device"[2]

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 1 & 2; Dkt. No. 257, at 16.)

(1) The Parties' Positions

Plaintiff submits that it proposes the construction reached in *Acer*. (Dkt. No. 239, at 19.) Plaintiff argues that:

> [T]he term "converter" is a well-known structural element that has a generally understood structural meaning in the art as confirmed by the dictionary definitions. (*See, e.g.,* Ex. I (MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY (10th ed. 1994) p. 254 ("converter - (d) a device that accepts data in one form and converts it to another")); Ex. J (THE IEEE STANDARD DICTIONARY OF ELECTRICAL AND ELECTRONICS TERMS (6th ed. 1996), p. 222 ("converter - (9) A device capable of converting impulses from one mode to another, such as analog to digital, parallel to serial, or from one code to another.")[])].)

(Dkt. No. 239, at 20.)

Defendants respond that "[t]he only discussion in the specification of the converter is limited: 'a converter 10 converts a stream of data symbols into plural sets of N data symbols each,'" and "converter 10" is identified in Figures 1 and 4 as a serial-to-parallel converter. (Dkt. No. 257, at 16 (quoting '802 Patent at 4:1-2).) Defendants submit that "[t]here is no disclosure

[2] In the December 10, 2012 Joint Claim Construction and Prehearing Statement, Defendants argued that "converter" is a means-plus-function term governed by 35 U.S.C. § 112, ¶ 6. (Dkt. No. 197, Ex. B, at 4.) In their response brief, as well as in the parties' March 7, 2013 P.R. 4-5(d) Joint Claim Construction Chart, Defendants no longer argue that "converter" is a means-plus-function term. (Dkt. No. 257, at 16 n.14; *see* Dkt. No. 285.)

in the '802 Patent of a 'converter' that performs any other type of conversion." (Dkt. No. 257, at 16.) Defendants conclude that Plaintiff's proposal is overbroad and that the extrinsic dictionary definitions cited by Plaintiff are "divorced from the context of the patent." (*Id.*, at 17.)

Plaintiff replies that "the claim language is clear that the converter converts a first stream of data symbols into plural sets of N data symbols each, and there is no basis for Defendants' alleged new concern that the claim could be read to encompass analog to digital converters or a converter for converting from one code to another." (Dkt. No. 266, at 5-6.)

At the March 21, 2013 hearing, Plaintiff further cited disclosures in the specification of analog-to-digital converters and digital-to-analog converters as evidence of the generic meaning of the term "converter" by itself.

(2) Analysis

In *Acer*, "the Court f[ound] that a person of ordinary skill understands that a 'converter' has a generally understood structural meaning that, in general, means a device that accepts data in one form or mode and changes it to another." *Acer* at 40.

Claim 1 of the '802 Patent recites (emphasis added):

> 1. A transceiver for transmitting a first stream of data symbols, the transceiver comprising:
>
> a *converter* for converting the first stream of data symbols into plural sets of N data symbols each;
>
> first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols; and
>
> means to combine the modulated data symbols for transmission.

The specification discloses "a converter 10 converts a stream of data symbols into plural sets of N data symbols each." '802 Patent at 4:1-2. Figures 1 and 4, reproduced in Section V.B., below, illustrate the converter 10 as a "serial-to-parallel" device. On balance, the Court does not limit the generic term "converter" to the specific type of device illustrated in Figures 1 and 4 of

the '802 Patent. *MBO Labs.*, 474 F.3d at 1333 (noting that "patent coverage is not necessarily limited to inventions that look like the ones in the figures"). Having considered the arguments in the present case, the Court reaches the same conclusion here as in *Acer*. *Acer* at 40.

The Court therefore hereby construes **"converter"** to mean **"a device that accepts data symbols in one form or mode and changes the data symbols to another form or mode."**

B. "converting [the / a] first stream of data symbols into plural sets of N data symbols each" (Claims 1 & 23)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
No construction necessary	"taking groups of data symbols from the first data stream, each group having N data symbols, and separating each group into N individual data symbols"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 1 & 2; *id.*, Ex. B, at 4.)

(1) The Parties' Positions

Plaintiff argues that "nowhere does it [(the patent)] suggest that the claimed 'converting' requires operation on 'groups of data symbols,' nor is it suggested that converting requires 'separating,' and the Defendant[s'] proposal is improper for at least these reasons." (Dkt. No. 239, at 21.)

Defendants respond:

> The specification confirms that the converter is disclosed by figs. 1 and 4 of the '802 Patent in view of the expression "Sym(k)=[sym(1,k) [. . .] sym(N,k)] is the kth information-bearing vector containing N symbols[.]" Proakis Decl. at ¶ 51 [(Dkt. No. 257-12)]; Ex. B, col. 2:38-40. To one of ordinary skill in the art, this expression describes the algorithm for converting a group of N data symbols Sym(k) into a plural set of data symbols sym(1,k), sym(2,k) . . .sym(N,k), or in other words, into "N individual data symbols."
>
> Given this expression in the context of figs. 1 and 4, one of ordinary skill in the art would understand "converting a/the first stream of data symbols into plural sets of N data symbols each" to mean that at a given point in time (k), the converter is taking a group of data symbols from the stream of data symbols

> Sym(k), each group having N data symbols, and separating each group in parallel into N individual data symbols (sym(1,k), sym(2,k), . . . sym(N,k)). Proakis Decl. at ¶ 52.

(Dkt. No. 257, at 17.)

Plaintiff replies that "Defendants' proposed language does not even appear in the patent specification" and "is simply an improper attempt to narrow the scope of the claim language to a preferred embodiment disclosed in the patent specification." (Dkt. No. 266, at 6.)

At the March 21, 2013 hearing, Defendants submitted that although the "taking" portion of their proposal could perhaps be omitted, the "separating" portion of their proposal is critical.

(2) Analysis

Acer did not address the disputed term here at issue. Although Plaintiff proposes that no construction is required, the parties have presented a "fundamental dispute regarding the scope of a claim term," and the Court has a duty to resolve that dispute. *O2 Micro*, 521 F.3d at 1362-63.

Claims 1 and 23 recite (reissue amendments shown with added text in italics and deleted text in bolded square brackets; underlining added for emphasis):

> 1. A transceiver for transmitting a first stream of data symbols, the transceiver comprising:
>
> a converter for converting the first stream of data symbols into plural sets of N data symbols each;
>
> first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols; and
>
> means to combine the modulated data symbols for transmission.
>
> * * *
>
> 23. A method of exchanging data streams between a plurality of transceivers, the method comprising the steps of:
>
> converting a first stream of data symbols into plural sets of N data symbols each;
>
> operating on the plural sets of N data symbols to produce modulated data symbols corresponding to a spreading of the first stream of data symbols over **[**N code symbols**]** *more than one and up to M direct sequence spread spectrum codes*;

combining the modulated data symbols for transmission; and

transmitting the modulated data symbols from a first transceiver at a time when no other of the plurality of transceivers is transmitting.

Figures 1 and 4, cited by Defendants, are reproduced here:

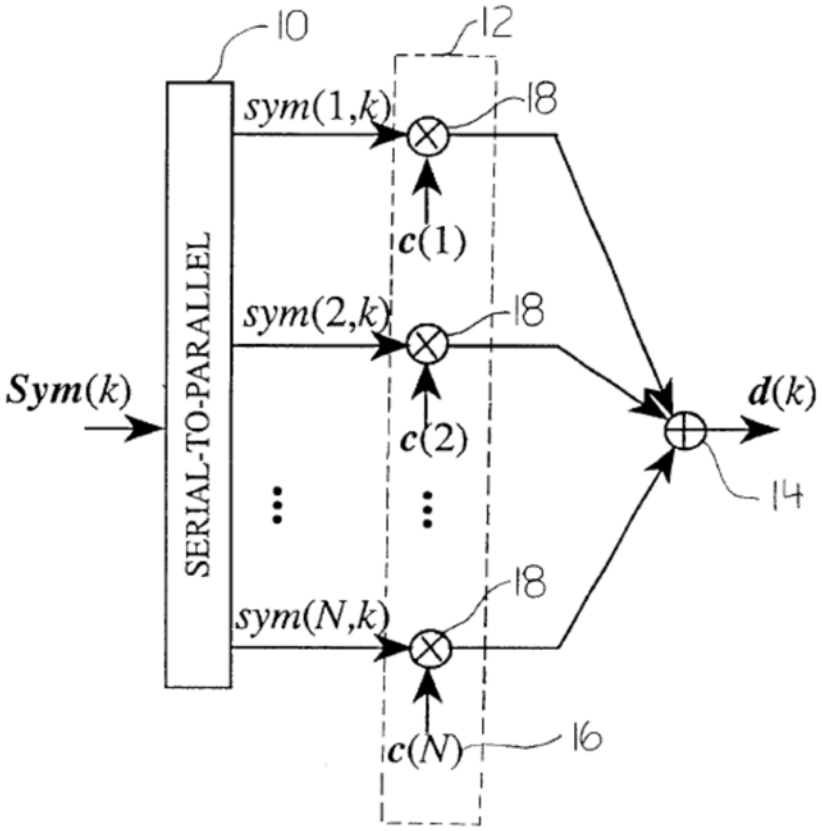


FIGURE 1

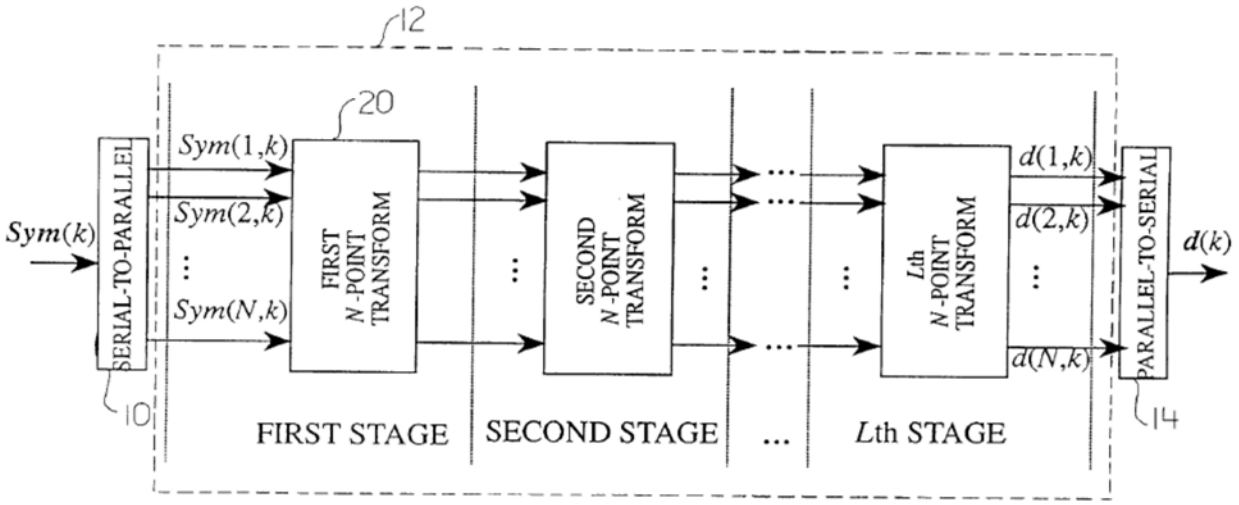


FIGURE 4

On balance, Figures 1 and 4 do not warrant limiting the "converting . . ." term here at issue. *See MBO Labs.*, 474 F.3d at 1333 (noting that "patent coverage is not necessarily limited to inventions that look like the ones in the figures"). The Court therefore rejects Defendants' proposal that each group must be separated into N individual data symbols.

Nonetheless, the disputed term should be construed to clarify and explain that the stream of data symbols is separated into multiple groups and that each group has N data symbols. *See TQP*, 2012 WL 1940849, at *2 ("The Court believes that some construction of the disputed claim language will assist the jury to understand the claims.").

The Court therefore hereby construes **"converting [the / a] first stream of data symbols into plural sets of N data symbols each"** to mean **"separating the first data stream into multiple groups of data symbols such that each group has N data symbols."**

C. "N" (Claims 1, 23 & 25)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"the number of parallel data symbols"	"the number of chips per DSSS code"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 2; *id.*, Ex. B, at 7.)

(1) The Parties' Positions

Plaintiff submits that although *Acer* did not construe "N," "the *Acer* Court's claim construction order recognized that 'N' is 'the number of data symbols,'" as also explained by the patentees during reissue prosecution. (Dkt. No. 239, at 21 (citing *Acer* at 46).) Plaintiff also argues that *Acer* rejected the defendants' argument that "N" must equal "M," where "M" refers to the number of chips per code. (*Id.*, at 23.)

Defendants respond that the Abstract and the Summary of the Invention expressly define "N" as "the number of chips per DSSS code." (Dkt. No. 257, at 18 (citing '802 Patent at Abstract & 2:6-10).) Defendants explain that "the DSSS system spreads a single data symbol using a single DSSS code, and the specification uses the term 'N' to describe the length (i.e., the number of chips) of the DSSS code." (Dkt. No. 257, at 18.) Defendants urge that "the concept of N as the number of chips per DSSS code is critical to the invention of the '802 Patent" because "[t]he patent purports to overcome [the prior art bandwidth] limitation by assigning multiple DSSS codes of length N to each transceiver." (*Id.*, at 19.) Defendants argue that Plaintiff's proposal must be rejected because "there is no definition of N that is given relative to the number of data symbols" and because Plaintiff's proposal simply rephrases surrounding claim language and would render the "N" limitation meaningless. (*Id.*, at 19-20.) Finally, Defendants argue that the declaration filed by the patentees during reissue prosecution does not outweigh the express definition in the specification. (*Id.*, at 20-21.)

Plaintiff replies that "the term 'N' is merely a common way to reference a variable number, which is used as such in different contexts in the specification and claims to refer to

different things." (Dkt. No. 266, at 6.) Plaintiff reiterates that the maximum number of codes need not be assigned to a single transceiver. (*See id.*, at 7-8.)

At the March 21, 2013 hearing, Plaintiff urged that the number of data symbols need not equal the number of DSSS codes because there is no requirement in the claims or the specification that all DSSS codes must be used. For example, if there are ten DSSS codes, nothing precludes the claimed invention from transmitting only six data symbols, Plaintiff argued. In response, Defendants emphasized that the reissue patent added "M" to the claims but did not alter the express definition in the specification that "N" equals the number of chips per DSSS code.

(2) Analysis

As a preliminary matter, the parties agree that the number of available codes is equal to the number of chips per code. Plaintiff explained that this is necessary so that the codes are "orthogonal," that is, so that the codes do not interfere with one another.

Claims 1, 23, and 25 recite (reissue amendments shown with added text in italics and deleted text in bolded square brackets; underlining added for emphasis):

> 1. A transceiver for transmitting a first stream of data symbols, the transceiver comprising:
>
> a converter for converting the first stream of data symbols into plural sets of N data symbols each;
>
> first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols; and
>
> means to combine the modulated data symbols for transmission.
>
> * * *
>
> 23. A method of exchanging data streams between a plurality of transceivers, the method comprising the steps of:
>
> converting a first stream of data symbols into plural sets of N data symbols each;

operating on the plural sets of N data symbols to produce modulated data symbols corresponding to a spreading of the first stream of data symbols over **[**N code symbols**]** *more than one and up to M direct sequence spread spectrum codes*;

combining the modulated data symbols for transmission; and

transmitting the modulated data symbols from a first transceiver at a time when no other of the plurality of transceivers is transmitting.

* * *

25. The method of claim 23 in which the spreading is an invertible randomized spreading and operating on the plural sets of N data symbols **[**includes**]** *comprises*:

transforming, by application of a transform, each set of N data symbols to generate **[**N**]** modulated data symbols as output.

In *Acer*, the Court found:

While the specification provides an example where M is equal to N, resulting in N data symbols and N codes with N chips per code, the specification never states that the number of data symbols (N) must equal the number of codes or chips per code (M).

Acer at 46.

The specification uses "N" in various contexts:

To enhance the throughput, we allow a single link (i.e., a single transceiver) to use more than one code at the same time. . . . In this patent, we present Multi-Code Direct Sequence Spread Spectrum (MC-DSSS) which is a modulation scheme that assigns *up to N codes* to an individual transceiver where *N is the number of chips per DSSS code*.

('802 Patent at 2:3-10 (emphasis added).)

FIG. 3 is a schematic showing of the ith MC code c(i)=[c(i,1) c(i,2) . . . c(i,NO) where i can take one of the N values: 1,2, . . . N corresponding to the position of the single '1' at the input of the first N-point transform.

(*Id.* at 2:54-57 (unmatched square bracket in original).)

A converter 10 converts a stream of data symbols into *plural sets of N data symbols* each. A computing means 12 operates on the *plural sets of N data symbols* to produce modulated data symbols corresponding to an invertible randomized spreading of the stream of data symbols. A combiner 14 combines the modulated data symbols for transmission. The computing means shown in FIG. 1 includes a source 16 of *N direct sequence spread spectrum code symbols*

> and a modulator 18 to modulate each ith data symbol from each set of *N data symbols* with the I code symbol from the *N code symbol* to generate *N modulated data symbols*, and thereby spread each I data symbol over a separate code symbol.

(*Id.* at 4:1-12 (emphasis added).)

> FIG. 3 illustrates the code generator of the MC codes. Any one of the P N-point transforms in FIG. 3 consists of a reversible transform to the extent of the available arithmetic precision. In other words, with finite precision arithmetic, the transforms are allowed to add a limited amount of irreversible error.
>
> One can use the MC-DSSS transmitter in FIG. 1 and the MC-DSSS receiver in FIG. 2 together with the MC codes generated using the code generator in FIG. 3 in order to implement MC-DSSS using the MC codes.
>
> An alternative transmitter to the one in FIG. 1 using the MC codes in FIG. 3 is shown in FIG. 4.
>
> The alternative transmitter shown in FIG. 4 includes a transformer 20 for *operating on each set of N data symbols to generate N modulated data symbols as output*. A series of transforms are shown.

(*Id.* at 4:29-42 (emphasis added).)

> During reissue prosecution, the patentees declared:
>
> In the claims and detailed description of the original patent, N is the number of data symbols in each data set. In the detailed description and in the summary of the original patent, N is also used in reference to the number of chips per direct sequence spread spectrum code and the maximum number of code[s]. Nevertheless, in the summary of the invention (see column 2, lines 2[-]6), it is clear that there are up to M codes (substituting M for N as stated in the summary), wherein M is the number of chips per code.[] Although M equals N in the detailed description (which is a possible embodiment of the invention), this is not necessary, as indicated at column 2, lines 2-6. M does not have to equal N. M is constrained by the number of chips per code, as illustrated in Figure 3. N, the number of data symbols per set of data symbols, is not constrained. Unfortunately, the lack of clarity from using 'N' in reference to both the number of data symbols and number of codes was erroneously perpetuated in a number of the claims, which this reissue application seeks to correct.

Acer at 45-46 (citing 9/8/1998 Combined Declaration and Power of Attorney for Reissue Patent Application, at 2 (attached to Defendants' response brief as Ex. G)).

"Idiosyncratic language, highly technical terms, or terms coined by the inventor are best understood by reference to the specification." *Intervet Inc. v. Merial Ltd.*, 617 F.3d 1282, 1287 (Fed. Cir. 2010) (citing *Phillips*, 415 F.3d at 1315). "So long as the meaning of an expression is made *reasonably* clear and its use is *consistent* within a patent disclosure, an inventor is permitted to define the terms of his claims." *Intellicall*, 952 F.2d at 1388 (quoting *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984) (emphasis added)); *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009) ("[W]e will adopt a definition that is different from the ordinary meaning when 'the patentee acted as his own lexicographer and *clearly* set forth a definition of the disputed claim term in either the specification or prosecution history.'") (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)) (emphasis added); *Sinogchem Co. v. ITC*, 511 F.3d 1132, 1138 (Fed. Cir. 2007) ("When the specification explains and defines a term used in the claims, *without ambiguity* or incompleteness, there is no need to search further for the meaning of the term.") (citing *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478 (Fed. Cir. 1998)) (emphasis added); *Vitronics Corp. v. Concenptronic Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) ("The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.").

On one hand, the specification seems to define "N" by stating that "N is the number of chips per DSSS code." ('802 Patent at 2:6-10 (emphasis added).) On the other hand, the specification uses N to refer to several different concepts, such as "plural sets of N data symbols," "N direct sequence spread spectrum code symbols," and "N modulated data symbols." *Id.* at 4:1-12; *id.* at 4:29-42 ("operating on each set of N data symbols to generate N modulated data symbols as output"). On balance, the specification sets forth no "reasonably clear,"

"consistent" lexicography. *Intellicall*, 952 F.2d at 1388. Instead, in the context in which the term is used in the claims, "N" refers to the number of parallel data symbols.

As for Defendants' argument that "N" must equal "M," "the use of both terms in close proximity in the same claim," namely dependent Claim 2 (which includes all of the limitations of Claim 1), "gives rise to an inference that a different meaning should be assigned to each." *Bancorp Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1373 (Fed. Cir. 2004). The recital in the claims of different terms, "N" and "M," is plain on its face and is strong evidence that N need not equal M. *See id.*

Defendants have urged that full compensation for the reduction in bandwidth caused by spreading is not achieved unless "N" equals "M," that is, unless the number of data symbols is equal to the number of codes and the number of chips per code. On balance, Defendants have failed to establish that this desired objective must be satisfied by the claims. *See Phillips*, 415 F.3d at 1327 ("[T]he fact that a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives.") (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 908 (Fed. Cir. 2004)).

Finally, to whatever extent Defendants maintain that the reissue impermissibly added new matter, claim construction is not the proper vehicle for resolving such a dispute:

> Although claims should be construed in light of the teachings of the specification, and although indefiniteness is a proper subject of claim construction, invalidity for "new matter" should be addressed in the context of summary judgment or trial. *Cf. Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1574 (Fed. Cir. 1992) (in context of 35 U.S.C. § 132, noting that "[t]he question whether new matter has been added to an application is a question of fact"); *Hester Indus., Inc. v. Stein, Inc.*, 142 F.3d 1472 (Fed. Cir. 1998) (reviewing grant of summary judgment that asserted reissue claims were invalid for failing to meet requirements of 35 U.S.C. § 251); *Commonwealth Scientific and Indus. Research Org. v. Buffalo Tech., Inc.*, 542 F.3d 1363, 1370, 1378-80 (Fed. Cir. 2008) (with

> regard to 35 U.S.C. § 132, reviewing summary judgment regarding new matter, which involves questions of fact).

Advanced Tech. Incubator, Inc. v. Sharp Corp., No. 2:07-CV-468, 2009 WL 4403314, at *20 (E.D. Tex. June 26, 2009); *see Phillips*, 415 F.3d at 1327 ("[W]e have certainly not endorsed a regime in which validity analysis is a regular component of claim construction.").

The Court therefore hereby construes **"N"** to mean **"the number of parallel data symbols."** Defendants' argument that "N" must equal "M" is hereby expressly rejected.

D. "invertible randomized spreading" (Claims 1, 10 & 25)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"spreading that is reversible and pseudo-randomized"	"spreading that is decodable and pseudo-randomized"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 3; *id.*, Ex. B, at 4.)

(1) The Parties' Positions

Plaintiff submits that it proposes the construction reached in *Acer*, and Plaintiff argues that "Defendants' proposed construction attempts to eliminate and eviscerate the 'reversible' aspect of that construction." (Dkt. No. 239, at 24.)

Defendants respond that "'invertible' means that the claimed technology allows a receiver to recover the pre-encoded symbols that are sent from a transmitter." (Dkt. No. 257, at 22.)

Plaintiff replies that "[t]he concept of using 'invertible' or 'reversible' transforms is key to the invention" and that "[t]he use of orthogonal spreading codes allows for the spreading to be properly reversed (or despread) at the receiver." (Dkt. No. 266, at 8-9.) Plaintiff submits that "Defendants' expert testified consistently with this construction." (*Id.*, at 8 n.19 (citing Ex. O, 2/19/2010 Proakis dep., at 24:7-10 ("By invertible, as I understand the term 'invertible' is that

whatever is done at the transmitter can be repeated at the receiver to undo the spreading that was caused at the transmitter.")).)

(2) Analysis

The parties have agreed that "spreading" means "distributing data symbols over codes to create a wider bandwidth of data symbols." (Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, at 2-3.)

In *Acer*, the Court found that "[t]he invertible randomized spreading of a signal is only invertible to the extent of the available arithmetic precision." *Id.* at 35.

Claims 1, 10, and 25 recite (reissue amendments shown with added text in italics and deleted text in bolded square brackets; underlining added for emphasis):

> 1. A transceiver for transmitting a first stream of data symbols, the transceiver comprising:
>
> a converter for converting the first stream of data symbols into plural sets of N data symbols each;
>
> first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols; and
>
> means to combine the modulated data symbols for transmission.
>
> * * *
>
> 10. The transceiver of claim 1 further **[**including**]** *comprising*:
>
> means for receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols; *and*
>
> second computing means for operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols.
>
> * * *
>
> 25. The method of claim 23 in which the spreading is an invertible randomized spreading and operating on the plural sets of N data symbols **[**includes**]** *comprises*:
>
> transforming, by application of a transform, each set of N data symbols to generate **[**N**]** modulated data symbols as output.

The specification discloses decoding as well as reversibility:

> In this patent, we introduce new codes, which we refer to as "MC" codes. Such codes allow the information in a MC-DSSS signal to be *decoded* in a sequence of low complexity parallel operations while reducing the ICI [(InterCode Interference)].

('802 Patent at 2:15-18 (emphasis added); *see id.* at Abstract (similar).)

> FIG. 3 illustrates the code generator of the MC codes. Any one of the P N-point transforms in FIG. 3 consists of a *reversible* transform to the extent of the available arithmetic precision. In other words, with finite precision arithmetic, the transforms are allowed to add a limited amount of irreversible error.

(*Id.* at 4:29-34 (emphasis added).)

> Examples of the N-point transforms in FIG. 3 are a Discrete Fourier Transform (DFT), a Fast Fourier Transform (FFT), a Walsh Transform (WT), a Hilbert Transform (HT), a Randomizer Transform (RT) as the one illustrated in FIG. 8, a Permutator Transform (PT) as the one illustrated in FIG. 9, an Inverse DFT (IDFT), an Inverse FFT (IFFT), an Inverse WT (IWT), an Inverse HT (IHT), an Inverse RT (IRT), an Inverse PT (IPT), and any other *reversible* transform.

(Id. at 4:66-5:7 (emphasis added).)

During prosecution of the '268 Patent (which reissued as the '802 Patent), the patentees clarified the meaning of invertible randomized spreading:

> It is well known in the art that a randomizer transform, as disclosed in the specification at page 4 and in Fig. 8, actually does not generate a perfectly randomized signal, which is impossible, but a near approximation to it, in other words a pseudo-random signal. In fact, it is believed to be well known in the art, and this is the meaning in each of the claims in this application for patent, namely in Claims 19 through 40 and 42 through 46, that when the term "randomizer", "randomized", or "randomizing" is used in relation to a spreading or transform of a signal, then it is a "pseudo-randomizer", "pseudo-randomized", or "pseudo-randomizing" spreading or transform that is being referred to. *The fact that the transform is in each case invertible, means that the transform is known beforehand and a signal encoded by use of the transform can be decoded using the inverse transform.*

(Dkt. No. 257, Ex. I, 2/9/1996 Response to Office Action, at 1-2 (emphasis added).)

In *Acer*, the Court considered these disclosures and this prosecution history and concluded that "[t]he ordinary meaning of the terms 'invert' or 'invertible' means to turn upside

down, to reverse in position or order, to turn or change to the opposite or contrary, or to turn inward or back upon itself. Based upon the specification, the claims, and the prosecution history, one of ordinary skill in the art would find that the term 'invertible' means 'reversible.'" *Acer* at 35-36.

At the March 21, 2013 hearing, Plaintiff urged that the word "orthogonal," in the phrase "orthogonal frequency division multiplexing," means that the codes do not interfere with one another and, as a result, the receiver can obtain "exactly what you started with." Thus, the degree of precision in recovering the original signal depends upon the codes, not merely the spreading or de-spreading processes. Further, as quoted above, the specification discloses that there may be some irreversibility. ('802 Patent at 4:29-34.) The word "reversible," which might be interpreted by the finder of fact as requiring perfect reversibility, should therefore be rejected. The word "decodable," proposed by Defendants, is more appropriate.

The Court accordingly hereby construes **"invertible randomized spreading"** to mean **"spreading that is decodable and pseudo-randomized."**

E. "modulated data symbols" (Claims 1, 10, 12, 14, 15, 23, 25, 29 & 31)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"data symbols that have been spread by a spreading code"	"spread and pseudo-randomized symbols"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 3; *id.*, Ex. B, at 5.)

(1) The Parties' Positions

Plaintiff argues that "[n]othing in the specification, claims, or the claim construction order suggests that 'modulated data symbols' must be 'pseudorandomized,' as would be required by Defendants' proposed construction." (Dkt. No. 239, at 26.)

Defendants respond that during prosecution, the patentees relied on randomization of the symbols. (Dkt. No. 257, at 23.)

Plaintiff replies that "Defendants' argument and proposed construction are directly contradicted by claims 23 and 25 of the patent" because whereas Claim 25 recites "invertible randomized spreading," Claim 23, from which Claim 25 depends, only recites "spreading." (Dkt. No. 266, at 9.)

(2) Analysis

Acer construed "modulator" as "a device that varies one or more of the amplitude, frequency, or phase of each data symbol." *Acer* at 57.

As a threshold matter, Plaintiff's claim differentiation argument as to Claim 25 is of limited weight because Claim 25 recites other limitations, such as that the spreading is invertible and that a transform is applied. *Rembrandt Techs., LP v. Cablevision Sys. Corp.*, No. 2012-1022, 2012 WL 4017470, at *9 (Fed. Cir. Sept. 13, 2012) ("There is no reason to apply the doctrine of claim differentiation, however, where, as here, the district court's construction does not render any claim redundant or superfluous."); *see Marine Polymer Techs., Inc. v. HemCon, Inc.*, 672 F.3d 1350, 1359 (Fed. Cir. 2012) ("[C]laim differentiation is not a hard and fast rule and will be overcome by a contrary construction dictated by the written description or prosecution history") (internal quotation marks omitted); *cf. Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1233 (Fed. Cir. 2001) ("Claim differentiation, while often argued to be controlling when it does not apply, is clearly applicable when there is a dispute over whether a limitation found in a dependent claim should be read into an independent claim, *and that limitation is the only meaningful difference between the two claims*.") (emphasis added).

The specification discloses:

> *A computing means 12 operates on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the stream of data symbols.* A combiner 14 combines the *modulated data symbols* for transmission. The computing means shown in FIG. 1 includes a source 16 of N direct sequence spread spectrum code symbols and a modulator 18 to modulate each ith data symbol from each set of N data symbols with the I code symbol from the N code symbol to generate N *modulated data symbols*, and thereby spread each I data symbol over a separate code symbol.

(*Id.* at 4:2-12 (emphasis added).)

> The alternative transmitter shown in FIG. 4 includes a transformer 20 for operating on each set of N data symbols to generate N *modulated data symbols* as output. A series of transforms are shown.

(*Id.* at 4:40-42 (emphasis added).)

During prosecution of the '268 Patent (from which the '802 Patent reissued), the patentees explained:

> . . . Burckert et al. ('614) and Albrieux et al. ('952) are considered the main references for the claims as amended. A sufficiently distinguishing feature of the independent Claims 19 and 35,[3] and all of the claims dependent on those claims, is that the apparatus of the invention operates on the symbols to be transmitted to generate an *invertible randomized spreading* of the symbols. The same argument applies to the method claims 42 through 46.
>
> *The key here is the randomization of the transformation.* It is known in the art to spread symbols and spread spectrum applications, including by using Walsh codes as shown in Albrieux et al. ('952). However, depending upon the data, the effect might be to de-spread the symbols, generating an unwanted pulse. *With randomized spreading, it is less likely that a pulse will be generated.* Hence, in general, the operation of the invention tends to reduce the peak to average intensity ratio of the spread signal being transmitted.

(Dkt. No. 257, Ex. H, 8/23/1995 Response to Office Action, at 15-16 (emphasis added).)

On balance, neither the specification nor the prosecution history contain any definitive statement or disclaimer mandating that "modulated data symbols" must be pseudo-randomized. *Omega Eng. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) ("As a basic principle of

[3] Application claims 19 and 35 appear to have issued as Claims 1 and 17 of the '268 Patent and, in turn, the '802 Patent.

claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public's reliance on *definitive* statements made during prosecution.") (emphasis added). Instead, randomization is a desirable feature that is addressed by other claim language, such as the term "invertible randomized spreading," which appears in Claim 1 and is discussed in Section V.D., above. Randomization therefore should not be imported into the term "modulated data symbols." *Electro Med.*, 34 F.3d at 1054.

The Court therefore hereby construes **"modulated data symbols"** to mean **"data symbols that have been spread by a spreading code."**

F. "means for receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols" (Claim 10)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Function: "receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols" Corresponding Structure: "element 22 of Figures 2 and 5, column 4:18-21, and equivalents thereof"	Indefinite Function: "receiving a sequence of modulated symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols" Corresponding Structure: No structure disclosed

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 4; *id.*, Ex. B, at 5-6.)

(1) The Parties' Positions

Plaintiff submits that it proposes the construction reached in *Acer*, and Plaintiff argues that *Acer* explicitly rejected an argument that the specification fails to disclose corresponding structure. (Dkt. No. 239, at 26-27.) Plaintiff has also emphasized that in the *Acer* proceedings,

Defendants Apple, Dell, and HP agreed that "item 22" of Figure 2 was corresponding structure. (*Id.*, at 27 (citing *Acer* at 49).)

Defendants respond: "The only mention in the specification of the means for receiving is limited to: 'A sequence of modulated data symbols is received at 22.' ['802 Patent], col. 4:18 . . . . This description does not define any structure but, rather, describes the function of something numbered 22." (Dkt. No. 257, at 24.) Defendants note that the number "22" in Figure 2 points to a horizontal line without any explanation, and "[o]ne of ordinary skill in the art would not understand what, if any, structure (e.g., physical structure, computer code, algorithm) is associated with the line in Figure 2 and unidentified number 22." (*Id.*, at 25.)

In reply, Plaintiff reiterates that *Acer* cited element 22 of Figure 2 and rejected an indefiniteness argument as to the disputed term. (Dkt. No. 266, at 10.)

At the March 21, 2013 hearing, Plaintiff withdrew any estoppel argument based on Defendants Apple, Dell, and HP having not argued for a finding of indefiniteness during the *Acer* case. Plaintiff also argued for the first time that the corresponding structure includes structure that separates the data stream, as shown by one arrow leading to multiple arrows in Figure 2 and by the "Serial-to-Parallel" block in Figure 5. Defendants responded that Plaintiff's interpretation of Figures 2 and 5 is not described in the specification.

(2) Analysis

General legal principles regarding indefiniteness are discussed in Section II., above.

Title 35 U.S.C. § 112 ¶ 6, allows a patentee to express a claim limitation as "a means or step for performing a specified function without the recital of structure, material, or acts in support thereof." *See Inventio AG v. Thyssenkrupp Elevator Ams.*, 649 F.3d 1350, 1355-56 (Fed. Cir. 2011). The Federal Circuit has further clarified what such functional claiming requires:

> Thus, in return for generic claiming ability, the applicant must indicate in the specification what structure constitutes the means. If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid the price but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification. Thus, if an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of § 112.

Biomedino, LLC v. Waters Techs. Corp., 490 F.3d 946, 948 (Fed. Cir. 2007) (citations and internal quotation marks omitted).

"If there is no structure in the specification corresponding to the means-plus-function limitation in the claims, the claim will be found invalid as indefinite." *Id.* at 950; *accord Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1363-65 (Fed. Cir. 2012); *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1338 (Fed. Cir. 2008). Further, "the written description must clearly link or associate structure to the claimed function." *Telcordia Techs., Inc. v. Cisco Sys., Inc.*, 612 F.3d 1365, 1376 (Fed. Cir. 2010).

In *Acer*, "[t]he Court f[ound] that the specification sufficiently links element 22 of Figures 2 and 5 as the corresponding structure for the 'means for receiving' limitation, and [the Court] therefore reject[ed the d]efendants' arguments to the contrary." *Acer* at 51.

Figures 2 and 5 are reproduced here:

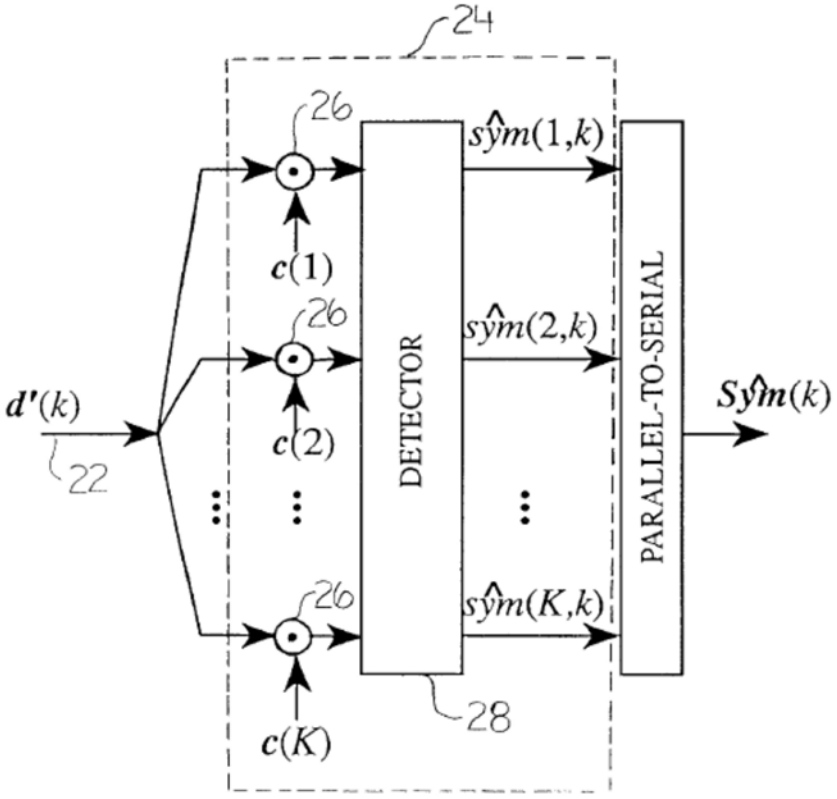


FIGURE 2

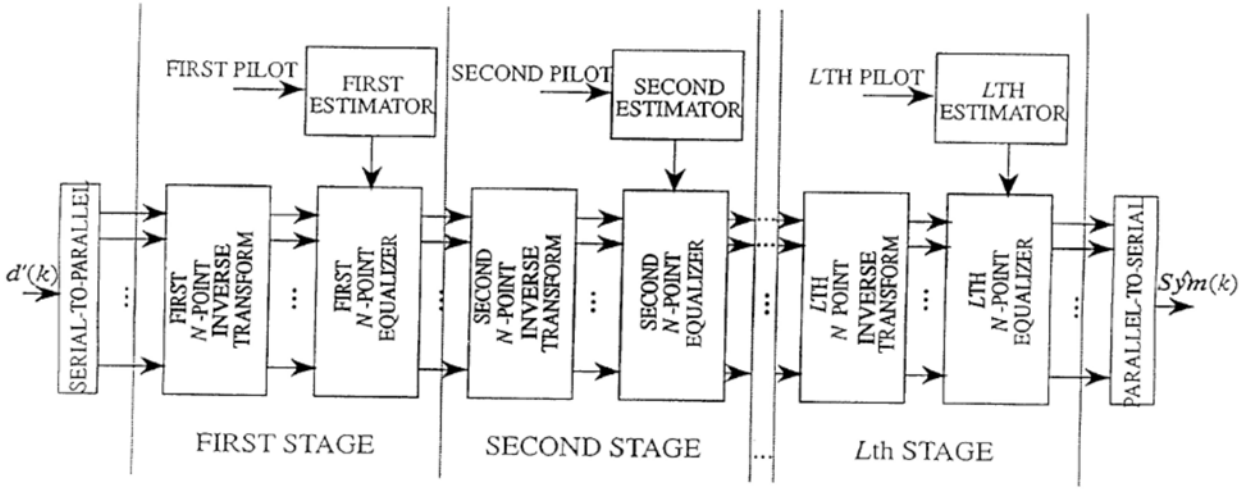


FIGURE 5

The specification discloses:

> A sequence of modulated data symbols is received at 22 in which the sequence of modulated data symbols has been generated by the transmitter such as is shown in FIG. 1 or 4.

('802 Patent at 4:18-21.) This disclosure adequately "link[s] or associate[s] structure to the claimed function." *Telcordia*, 612 F.3d at 1376.

Upon consideration of the arguments here, the Court reaches substantially the same conclusion as in *Acer*. The Court finds that adequate corresponding structure is disclosed in Figure 2 and the corresponding written description. Because Figure 5 does not include the reference numeral 22, the Court's construction will refer only to Figure 2.

The Court therefore hereby finds that for the term **"means for receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols,"** the function is **"receiving a sequence of modulated data symbols, the modulated data symbols having been generated by invertible randomized spreading of a second stream of data symbols"** and the corresponding structure is **"element 22 of Figure 2, and equivalents thereof."**

G. "a set of more than one and up to M codes, where M is the number of chips per code" (Claims 12 & 23) and "more than one and up to M direct sequence spread spectrum codes" (Claim 23)

"a set of more than one and up to M codes, where M is the number of chips per code" (Claims 12 & 23)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary	Indefinite
"more than one and up to M direct sequence spread spectrum codes" (Claim 23)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
No construction necessary	Indefinite

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 5; *id.*, Ex. B, at 6-7.)

At the March 21, 2013 hearing, Defendants withdrew their indefiniteness argument and agreed that the disputed terms should be construed to have their plain meaning. Defendants' explained that their validity challenge would be more appropriately brought by later motion rather than as part of claim construction proceedings. Plaintiff had no objection to the Court construing the disputed terms to have their plain meaning.

The Court therefore adopts the parties' agreement and hereby construes **"a set of more than one and up to M codes, where M is the number of chips per code"** and **"more than one and up to M direct sequence spread spectrum codes"** to have their **plain meaning**.

H. "means to apply diversity to the combined modulated data symbols before transmission" (Claim 15)

Plaintiff's Proposed Construction	Defendants' Proposed Construction
Function: "apply diversity to the combined modulated data symbols before transmission" Corresponding Structure: "element 32 in FIG. 6, columns 4:47-51, 5:26-30, 6:36-38, and equivalents thereof"	Indefinite Function: "apply diversity to the combined modulated data symbols" Corresponding Structure: No structure disclosed

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 6; *id.*, Ex. B, at 7.)

(1) The Parties' Positions

Plaintiff argues that although Defendants urge that the disputed term is indefinite because of lack of corresponding structure, "[t]he '802 patent provides several descriptions of the 'means

to apply diversity.'" (Dkt. No. 239, at 28 (citing '802 Patent at 4:47-51, 5:26-30, 6:36-38 & Fig. 6).)

Defendants respond that disclosure of "diversity module 32" is insufficient to constitute corresponding structure. (Dkt. No. 257, at 25.) Defendants also argue that the references to "time diversity" and "antenna diversity," cited by Plaintiff, "describe types of functions" and do not constitute structure. (*Id.*, at 26.) Defendants conclude that the disputed means-plus-function term lacks corresponding structure and thereby renders the claim invalid as indefinite. (*Id.*)

Plaintiff replies that "'time diversity' and 'antenna diversity' were structures well-known to persons of ordinary skill for applying diversity to modulated data symbols." (Dkt. No. 266, at 10.)

(2) Analysis

"If there is no structure in the specification corresponding to the means-plus-function limitation in the claims, the claim will be found invalid as indefinite." *Biomedino*, 490 F.3d at 950; *accord Ergo Licensing*, 673 F.3d at 1363-65; *Tech. Licensing*, 545 F.3d at 1338. Further, "the written description must clearly link or associate structure to the claimed function." *Telcordia*, 612 F.3d at 1376.

The portions of the specification cited by Plaintiff disclose:

> Both transmitters in FIGS. 1 and 4 allow using shaper 30 in *diversity module 32* [for] shaping and time diversity of the MC-DSSS signal as shown in FIG. 6. We will refer to the MC-DSSS frame with shaping and time diversity as a Data frame.
>
> Both receivers in FIGS. 2 and 5 allow diversity combining followed by the unshaping of the Data frame as shown in FIG. 7. A Synch. is required in FIG. 7 for frame synchronization.

('802 Patent at 4:47-55 (emphasis added).)

> *Time Diversity in FIG. 6* can consist of repeating the MC-DSSS frame several times. It can also consist of repeating the frame several times then complex

> conjugating some of the replicas, or shifting some of the replicas in the frequency domain in a cyclic manner.
>
> Diversity combining in FIG. 7 can consist of cophasing, selective combining, Maximal Ratio combining or equal gain combining.

(*Id.* at 5:26-33 (emphasis added).)

> A further extension to the MC-DSSS modulation technique consists of using *antenna Diversity* in order to improve the Signal-to-Ratio level at the receiver.

(*Id.* at 6:36-38 (emphasis added).) The concepts of "time diversity" and "antenna diversity" are explained further in portions of textbooks that Plaintiff cited and attached to its reply brief. (Dkt. No. 266, Ex. P, Roger L. Peterson, Rodger E. Ziemer, and David E. Borth, *Introduction to Spread Spectrum Communications* 497-500 (1995); *id.*, Ex. Q, John G. Proakis, *Digital Communications* 719-20 (2d ed. 1989).)

Figure 6 of the '802 Patent is reproduced here:

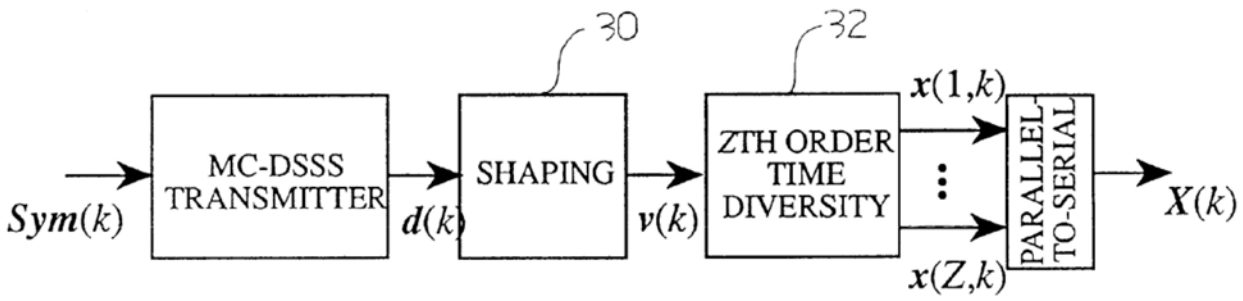


FIGURE 6

Under some circumstances, the disclosure of an element in the specification might not satisfy the requirement for disclosure of corresponding structure. *See Alcatel USA Res. Inc. v. Microsoft Corp.*, No. 6:06-CV-500, 2008 WL 2625852, at *17 (E.D. Tex. June 27, 2008) (Davis, J.) (finding that the "broad disclosure of a 'set-up program module' executed on a processor, similar to 'software' or 'appropriate programming,' is not sufficient algorithmic

structure"); *see also Ranpack Corp. v. Storopack, Inc.*, No. 98-1009, 1998 WL 513598, at *2 (Fed. Cir. July 15, 1998) (finding that a "module" was a "black box" that did not connote sufficient structure); *Mass. Inst. of Tech. v. Abacus Software*, 462 F.3d 1344, 1354 (Fed. Cir. 2006) ("The generic terms 'mechanism,' 'means,' 'element,' and 'device,' typically do not connote sufficiently definite structure.").

On balance, the disclosure of the "Zth Order Time Diversity" element 32 in Figure 6, as well as the accompanying description in the specification, "clearly link or associate structure to the claimed function." *Telcordia*, 612 F.3d at 1376. Defendants' indefiniteness challenge is therefore hereby expressly rejected.

The Court accordingly hereby finds that for the term **"means to apply diversity to the combined modulated data symbols before transmission,"** the function is **"apply diversity to the combined modulated data symbols before transmission"** and the corresponding structure is **"element 32 in FIG. 6, and equivalents thereof."**

I. "first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols" (Claim 1), "means to combine the modulated data symbols for transmission" (Claim 1), and "second computing means for operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols" (Claim 10)

"first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols" (Claim 1)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Function: "operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols" Corresponding Structure: "element 12 of Figures 1 and 4, columns 2:6-10, 2:36-40, 2:58-62, 4:2-12 and 4:35-44, and equivalents thereof"	Function: "operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols" Corresponding Structure: "element 12 as shown in Figs. 1 and 4 and described in col. 2:6-10, 36-40, 58-62; col. 4:2-4, 6-12, 35-44"
"means to combine the modulated data symbols for transmission" (Claim 1)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Function: "combine the modulated data symbols for transmission" Corresponding Structure: "element 14 of Figures 1 and 4, column 4:5-7, and equivalents thereof"	Function: "combine the modulated data symbols for transmission" Corresponding Structure: "combiner 14 as shown in Fig. 1 and described in col. 4:4-6 or parallel-to-serial converter 14 as shown in Fig. 4"

"second computing means for operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols" (Claim 10)	
Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
Function: "operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols" Corresponding Structure: "element 24 of Figure 2, the elements of FIG. 5 between the serial-to-parallel and parallel-to-serial converters, columns 2:41-54, 2:63-67, 4:21-28, and equivalents thereof"	Function: "operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols" Corresponding Structure: "element 24 as shown in Fig. 2 and described in col. 2:41-53; col. 4:21-28 or the component between the serial-to-parallel and parallel-to-serial converters as shown in Fig. 5 and described in col. 2:63-67"

(Dkt. No. 197, 12/10/2012 Joint Claim Construction and Prehearing Statement, Ex. A as to '802 Patent, at 3 & 4-5; *id.*, Ex. B, at 4, 5 & 6.)

After the close of briefing, the parties reached agreement, as reflected in the parties' March 7, 2013 P.R. 4-5(d) Joint Claim Construction Chart (*see* Dkt. No. 285), that the disputed terms should be construed as follows:

Term	Construction
"first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols" (Claim 1)	**Function:** **"operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols"** **Corresponding Structure:** **"element 12 of Figures 1 and 4, columns 2:6-10, 2:36-40, 2:58-62, 4:2-12 and 4:35-44, and equivalents thereof"**
"means to combine the modulated data symbols for transmission" (Claim 1)	**Function:** **"combine the modulated data symbols for transmission"** **Corresponding Structure:** **"element 14 of Figures 1 and 4, column 4:5-7, and equivalents thereof"**
"second computing means for operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols" (Claim 10)	**Function:** **"operating on the sequence of modulated data symbols to produce an estimate of the second stream of data symbols"** **Corresponding Structure:** **"element 24 of Figure 2, the elements of FIG. 5 between the serial-to-parallel and parallel-to-serial converters, columns 2:41-54, 2:63-67, 4:21-28, and equivalents thereof"**

The Court hereby adopts the parties' agreed constructions.

VI. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted

by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

Within thirty (30) days of the issuance of this Memorandum Opinion and Order, the parties are hereby ORDERED, in good faith, to mediate this case with the mediator agreed upon by the parties. As a part of such mediation, each party shall appear by counsel and by at least one corporate officer possessing sufficient authority and control to unilaterally make binding decisions for the corporation adequate to address any good faith offer or counteroffer of settlement that might arise during such mediation. Failure to do so shall be deemed by the Court as a failure to mediate in good faith and may subject that party to such sanctions as the Court deems appropriate.

So ORDERED and SIGNED this 11th day of April, 2013.

RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE