IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TQ DELTA, LLC, Plaintiff, v. ZYXEL COMMUNICATIONS, INC. and ZYXEL COMMUNICATIONS CORPORATION, Defendants.	Civil Action No. 1:13-cv-02013-RGA
TQ DELTA, LLC, Plaintiff, v. ADTRAN, INC., Defendants.	Civil Action No. 1:14-cv-00954-RGA
ADTRAN, INC., Plaintiff, v. TQ DELTA, LLC, Defendant.	Civil Action No. 1:15-cv-00121-RGA

MEMORANDUM OPINION

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ANDREWS, U.S. DISTRICT JUDGE:

Presently before the Court is the issue of claim construction of multiple terms in U.S. Patent Nos. 6,445,730 ("the '730 patent"); 7,978,753 ("the '753 patent"); 8,437,382 ("the '382 patent"); and 8,611,404 ("the '404 patent"). The Court has considered the Parties' Joint Claim Construction Brief. (Civ. Act. No. 13-02013-RGA, D.I. 441; Civ. Act. No. 14-00954-RGA, D.I. 297; Civ. Act. No. 15-00121-RGA, D.I. 297).[1] The Court heard oral argument on January 19, 2018. (D.I. 513).

I. BACKGROUND

The patents-in-suit represent "Family 7" of the patents that Plaintiff has asserted against Defendants, and they share a common specification. (D.I. 441, p. 1 n.1). The Family 7 patents relate to multicarrier transmission systems with low power mode or sleep mode and rapid-on capabilities.

II. LEGAL STANDARD

"It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (citation omitted). "'[T]here is no magic formula or catechism for conducting claim construction.' Instead, the court is free to attach the appropriate weight to appropriate sources 'in light of the statutes and policies that inform patent law.'" *SoftView LLC v. Apple Inc.*, 2013 WL 4758195, at *1 (D. Del. Sept. 4, 2013) (quoting *Phillips*, 415 F.3d at 1324) (alteration in original). When construing patent claims, a court considers the literal language of the claim, the patent specification, and the prosecution history. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979-80 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). Of these sources, "the specification is always highly relevant to the claim construction analysis. Usually, it is

[1] Unless otherwise specifically noted, all references to the docket refer to Civil Action No. 13-2013-RGA.

dispositive; it is the single best guide to the meaning of a disputed term." *Phillips*, 415 F.3d at 1315.

"[T]he words of a claim are generally given their ordinary and customary meaning. . . . [This 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 1312-13. "[T]he ordinary meaning of a claim term is its meaning to [an] ordinary artisan after reading the entire patent." *Id.* at 1321. "In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words." *Id.* at 1314.

When a court relies solely upon the intrinsic evidence—the patent claims, the specification, and the prosecution history—the court's construction is a determination of law. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015). The court may also make factual findings based upon consideration of extrinsic evidence, which "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Phillips*, 415 F.3d at 1317-19. Extrinsic evidence may assist the court in understanding the underlying technology, the meaning of terms to one skilled in the art, and how the invention works. *Id.* Extrinsic evidence, however, is less reliable and less useful in claim construction than the patent and its prosecution history. *Id.*

"A claim construction is persuasive, not because it follows a certain rule, but because it defines terms in the context of the whole patent." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). It follows that "a claim interpretation that would exclude

the inventor's device is rarely the correct interpretation." *Osram GMBH v. Int'l Trade Comm'n*, 505 F.3d 1351, 1358 (Fed. Cir. 2007) (citation omitted).

III. CONSTRUCTION OF DISPUTED TERMS

The asserted patents claim both an apparatus and a method for the reliable exchange of diagnostic and test information over a multicarrier communications system.

Plaintiff asserts claims 1, 4, 6, and 10 of the '404 patent. They read as follows:

1. An apparatus comprising a transceiver operable to:

transmit, in a full power mode, a plurality of superframes, wherein the superframe comprises a plurality of data frames followed by a synchronization frame;

transmit, in the full power mode, a *synchronization signal*;

receive a message to enter into a *low power mode*;

enter into the *low power mode* by reducing a power consumption of at least one portion of a transmitter;

store, in the *low power mode*, *at least one parameter associated with the full power mode operation* wherein the at least one parameter comprises at least one of a fine gain parameter and a bit allocation parameter;

transmit, in the *low power mode*, a *synchronization signal*; and

exit from the low power and *restore the full power mode by using the at least one parameter and without needing to reinitialize the transceiver.*

4. The apparatus of claim 1, wherein the apparatus is a CO device that is capable of transmitting internet and video data.

6. An apparatus comprising a transceiver operable to:

receive, in a full power mode, a plurality of superframes, wherein the superframe comprises a plurality of data frames followed by a synchronization frame;

receive, in the full power mode, a *synchronization signal*;

transmit a message to enter into a *low power mode*;

store, in a *low power mode*, *at least one parameter associated with the full power mode operation* wherein the at least one parameter comprises at least one of a fine gain parameter and a bit allocation parameter;

receive, in the *low power mode*, a *synchronization signal*; and

exit from the low power and *restore the full power mode by using the at least one parameter and without needing to reinitialize the transceiver*.

10. The apparatus of claim 6, wherein the apparatus is a customer premises equipment that is capable of transmitting internet and video data.

('404 patent, claims 1, 4, 6, 10) (disputed terms italicized). The '404 patent is asserted against Defendant Adtran only. (D.I. 441, p. 1 n.2).

Plaintiff asserts claims 18 and 22 of the '730 patent. They read as follows:

18. A multicarrier transceiver having a *sleep mode* capability, comprising:
memory that stores *at least one parameter representative of an operating mode* of said multicarrier transceiver;

a controller that places at least one component of said multicarrier transceiver in a *sleep mode* responsive to a sleep mode signal and restores said at least one component of said multicarrier transceiver to the operating mode in response to an awaken signal, the restoration to the operating mode occurring without needing to reinitialize said multicarrier transc[ei]ver by *recovering said at least one stored parameter from the memory*; and

a synchronizer module that uses a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode.

22. The multicarrier transceiver of claim 18 wherein said at least one parameter comprises at least one of a frequency-domain equalizer coefficient, a time-domain equalizer coefficient, an echo canceller tap, a data rate, a coding parameter, an interleaving parameter, a fine gain parameter, a subchannel gain parameter, and a bit allocation table.

('730 patent, claims 18, 22) (disputed terms italicized).

Plaintiff asserts claims 1 and 2 of the '753 patent. They read as follows:

1. A multicarrier transceiver having a *sleep mode* capability, comprising

A. *means responsive to a sleep mode command for:*

(1) storing selected state parameters characteristic of the communications channel over which the transceiver is operating; and

(2) reducing power to selected portions of transceiver circuitry; and

B. *means responsive to a wake-up command for:*

(1) restoring power to said transceiver;

(2) restoring the state of said transceiver from said sleep mode by means of said stored parameters; and

C. *means for maintaining a common, synchronized data frame count between said transceiver and a remote transceiver with which it communicates, to thereby facilitate restoration of communication without reinitialization of said transceiver*, wherein the state parameters include one or more parameters selected from the group comprising frequency-domain equalizer coefficients, time domain equalizer coefficients, echo canceller coefficients, bit allocations, coding parameters, fine gains, and subchannel gains.

2. A multicarrier transceiver according to claim 1 in which the means for maintaining said frame count comprises a signal defining a timing reference during at least the time when said first transceiver is in *sleep mode*.

('753 patent, claims 1, 2) (disputed terms italicized).

Plaintiff asserts claim 14 of the '382 patent, which reads as follows:

14. A multicarrier transceiver having a *sleep mode* capability comprising:
a transmitter or receiver portion capable of:

placing at least one component of a first multicarrier transceiver in a *sleep mode*;

storing at least one parameter representative of a full power mode of the at least one component of the first multicarrier transceiver;

maintaining synchronization between the first multicarrier transceiver and a second multicarrier transceiver using a *synchronization signal* while the at least one component of the first multicarrier transceiver is in the *sleep mode*;

using the at least one stored parameter, for transmission or reception, in response to a signal to awaken from the *sleep mode*; and

restoring the at least one component of the first multicarrier transceiver from the *sleep mode* to the full power mode, without needing to reinitialize the first multicarrier transceiver, by using the at least one *recovered parameter*, wherein the transceiver is used for communications over an internet.

('382 patent, claim 14) (disputed terms italicized).

1. "low power mode"

a. *Plaintiff's proposed construction*: "a state of operation in which power is consumed, but the amount of power consumed is less than when operating in a state with full data transmission capabilities"

b. *Defendant Adtran's proposed construction*: "a mode in which the circuitry is not transmitting or receiving content and the circuitry consumes power, but the amount of power consumed is less than the full power mode"

c. *Court's construction*: "a mode in which the circuitry consumes power, but the amount of power consumed is less than the full power mode"

This term appears in each of the asserted claims of the '404 patent. Although the parties agree that less power is consumed in the low power mode than in full power mode, they disagree regarding how to characterize this reduction in power. (D.I. 441, p. 15). They also disagree regarding whether the "low power mode" requires that no content is transmitted or received. (*Id.*).

With respect to how to characterize the reduction in power associated with the "low power mode," Plaintiff asserts that its construction is proper because it makes clear that in the "low power mode, less power is consumed than in a full power mode but power is still being consumed." (*Id.* p. 16). As support, Plaintiff cites claims 1 and 6, which recite transmitting and receiving, respectively, "in the low power mode, a synchronization signal." (*Id.*). Plaintiff also cites portions of the specification discussing maintaining synchrony in "sleep mode" that recite maintaining power to certain portions of the transceiver circuitry. (*Id.* (citing '404 patent at 7:21-25, 7:42-44)). It is proper to characterize the power consumed in low power mode as being "less than when

operating in a state with full data transmission capabilities," Plaintiff argues, because the specification explains (1) "that transceivers in the 'on' state 'consume a significant amount of power, even when they are not actively transmitting or receiving data.'" and (2) that the "'on' state (or full power mode) is a state where the transceiver has 'full data transmission capabilities.'" (*Id.* p. 15 (citing '404 patent at 2:59-60, 8:21-23)).

Defendant counters that its construction should be adopted because its construction "is drawn directly from the claims' comparison of a 'low power mode' and 'full power mode.'" (*Id.* p. 20). Plaintiff contends that Defendant's proposed construction is "unhelpful" because it compares "low power mode" to "full power mode" without clarifying what "full power mode" means. (*Id.* p. 25). Plaintiff also takes issue with Defendant's proposed construction because "it could be interpreted to read on a state in which a transceiver receives no power. (*Id.* pp. 16-17). Defendant disclaims any reading of its proposed construction that covers such a state, and offers an alternate construction that clarifies that "the circuitry consumes power, but the amount of power consumed is less than the full power mode." (*Id.* p. 32 (emphasis omitted)).

On this point I agree with Defendant. Defendant's alternate construction addresses Plaintiff's primary opposition to Defendant's characterization of the reduction in power by clarifying that power is consumed in the "low power mode."

Plaintiff equates the "on" state with the "full power mode" recited in the claims, and has not offered a compelling reason to define "low power mode" in terms of data transmission capabilities. (*See id.* p. 15). Though the specification describes a transceiver in "sleep mode" as "consum[ing] reduced power when it is not needed for transmission or reception," the claims themselves do not recite any data transmission limitation for "low power mode." ('404 patent,

6:1-6, 10:2-12:21). Instead, as Defendant points out, the claims compare "low power mode" to "full power mode." (D.I. 441, p. 20; *see, e.g.*, '404 patent at 10:2-18).

I do not find compelling Plaintiff's criticism that comparing "low power mode" to "full power mode" in defining "low power mode" has no meaning. To the contrary, I think that the meaning of "full power mode" is readily understandable and requires no construction, and that the claims' definition of "low power mode" with reference to "full power mode" provides ample guidance that a transceiver in "low power mode" consumes some power, but consumes less power than a transceiver in full power mode. ('404 patent at 10:6-9 (reciting "enter[ing] into the low power mode by reducing a power consumption of at least one portion of the transmitter" following "transmi[ssion], in the full power mode, [of] a synchronization signal")). Rather than clarifying meaning, Plaintiff's proposed construction seeks to replace "full power mode" with, "a state of full data transmission capabilities." In context, I do not think that "a state with full data transmission capabilities" imparts any more meaning than "full power mode." I find that Plaintiff's proposed construction amounts to a substitution of the words the patentee chose without adequate justification. *See Interactive Gift Exp., Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) ("In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point[] out and distinctly claim[] the subject matter which the patentee regards as his invention.'" (citation omitted) (brackets in original)).

The parties also dispute whether "low power mode" should be limited to a mode in which no content is transmitted or received. Plaintiff urges that importing any limitation defining "low power mode" with respect to the transfer of content is improper because doing so would import a limitation to the claims from an embodiment. (D.I. 441, pp. 17, 28) According to Plaintiff, the

specification discloses embodiments that contemplate the transmission of content during "low power mode." (*Id.* (citing '404 patent at 8:47-55 (disclosing "'partial' sleep mode, in which only part of each transceiver is powered down," for example "where data transfer is one-way"), 5:54 (disclosing that the [fast Fourier transform] is dormant during "sleep mode"), 7:21 (disclosing "reduce[d] power to parts of the analog circuitry" during "sleep mode")). Plaintiff further asserts that Defendant's proposed use of the word "content" introduces ambiguity to the term, since the specification does not use the word "content." (*Id.* p. 18). Additionally, Plaintiff points to U.S. Patent No. 9,094,268 ("the '268 patent"), a member of the same patent family as the '404 patent with the same inventorship. (D.I. 441, pp. 29-30). According to Plaintiff, the '268 patent provides evidence that when the patentee intended to claim "low power mode" in terms of content transmission, the patentee explicitly did so. (*Id.*; D.I. 513 at 25:6-26:6). In relevant part, the '268 patent claims "entering the low power mode, wherein a transmitter portion of the transceiver does not transmit data during the low power mode." ('268 patent at 10:9-11). Therefore, Plaintiff argues, no content or data limitation should be imported into this term in the '404 patent, because the patentee did not expressly include it in the claims, and the '404 patent does not contain disclosures that preclude data transmission in a low power mode. (D.I. 513 at 26:3-6, 40:2-9).

According to Defendant, descriptions of "the present invention" in the Abstract, Figure 2, the specification, and provisional application No. 60/072,447 (to which the Family 7 patents claim priority) support a construction that precludes content transmission or reception during "low power mode." (D.I. 441, pp. 21-22). For example, the Abstract discloses, "A multicarrier transceiver is provided with a sleep mode in which it idles with reduced power consumption when it is not needed to transmit or receive data." ('404 patent, Abstract). Defendant also points to the specification's disclosure of a "partial sleep mode," in which content can be communicated in a

"one-way' mode," as consistent with the limitation that no content is transmitted during "sleep mode." (*Id.* p. 23). According to Defendant, the specification's disclosure that content may be transmitted during "partial sleep mode" provides evidence of a common understanding that no content is transmitted during "sleep mode." (*Id.* pp. 23-24). Therefore, Defendant contends, "Plaintiff cannot now construe the claims as if 'partial' had been included." (*Id.* p. 24).

On this point I agree with Plaintiff. The claims of the related '268 patent demonstrate that the patentee knew how to draft claims that define "low power mode" in terms of data transmission, and the claims of the '404 patent contain no such limitation. Though Defendant points to examples in the specification that are consistent with its proposed content limitation, Defendant has not provided convincing evidence that the examples it cites preclude any content transmission during "low power mode." Indeed, the parties each identify some of the same embodiments (such as the specification's discussion of "partial sleep mode") to support their positions. (*Id.* pp. 17, 23-24). Accordingly, I decline to import a limitation into this term that would preclude the transmission of content.

Therefore, I will construe "low power mode" to mean "a mode in which the circuitry consumes power, but the amount of power consumed is less than the full power mode."

2. "sleep mode"

a. *Plaintiff's proposed construction*: "a state of operation in which power is consumed, but the amount of power consumed is less than when operating in a state with full data transmission capabilities"

b. *Defendants' proposed construction*: "a mode in which the circuitry is not transmitting or receiving content and is powered down"

c. *Court's construction*: "a mode in which the circuitry is not transmitting or receiving content, and the amount of power consumed is less than when operating in full power mode"

This term appears in all asserted claims of the '730, '753, and '382 patents, which are asserted against all defendants. The parties disagree as to whether "sleep mode" and "low power mode" should have the same construction, and whether "sleep mode" requires that no content be transmitted or received.

Plaintiff maintains that "low power mode" and "sleep mode" should be given the same construction because "there is no significant discernable difference in the meaning or scope of the claimed 'sleep mode' and the claimed 'low power mode.'" (D.I. 441, p. 34). According to Plaintiff, since "the specification does not distinguish between 'low power mode' and 'low power sleep mode,' and does not discuss 'low power mode' at all, there simply is nothing in the intrinsic record to suggest that 'sleep mode' should be construed to have a different scope than 'low power mode.'" (*Id.* p. 45 (citing *Pickholtz v. Rainbow Techs., Inc.*, 284 F.3d 1365, 1373 (Fed. Cir. 2002))). Plaintiff also points to the title and summary of invention sections of the Family 7 patents, which refer to "low power sleep mode." (*Id.* p. 45 n.41).

Defendants respond that I should not adopt the same construction for "sleep mode" and "low power mode," because some of the unasserted claims recite both "sleep mode" and "low power mode." (*Id.* pp. 50-51 (citing '730 patent, claim 6; '382 patent, claims 6, 19)). Defendants also rely on their expert's unsupported declaration to argue that the ordinary meaning for sleep mode is different from low power mode because the "power reduction for sleep mode is greater than the power reduction for low power mode by virtue of the term 'sleep.'" (*Id.* p. 52). According to Defendants, the specification's failure to reference "low power mode" alone cannot demonstrate that "sleep mode" and "low power mode" have the same meaning because the specification fails to amount to "the 'clear import' needed to overcome the plain distinction that the claim language

draws." (*Id.* p. 51). Therefore, Defendants argue, Plaintiff has failed to overcome the presumption that "sleep mode" and "low power mode" have different meanings. (*Id.* p. 50).

I agree with Defendants that "sleep mode" and "low power mode" should be construed to have different meanings. Unasserted dependent claim 6 of the '730 patent recites, "The method of claim 1 wherein placing said at least one component of said first multicarrier transceiver in the sleep mode comprises placing said at least one component of said first multicarrier transceiver in a low power mode." ('730 patent, claim 6). The patentee's choice to recite "sleep mode" and "low power mode" in the same claim, and use of language that placing a component of a transceiver in "sleep mode" "comprises" placing the component in "a low power mode" counsels against adopting the same construction for "sleep mode" and "low power mode." *See Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991) ("All the limitations of a claim must be considered meaningful"). Adopting the same construction for both terms would render the additional limitation of claim 6 of the '730 patent circular. By contrast, I think that an interpretation under which "low power mode" represents an intermediate mode between "full power mode" and "sleep mode" comports with the "comprising" language in claim 6 of the '730 patent and is consistent with the specification. I do not find convincing Plaintiff's citation to *Pickholtz* to support the proposition that there is "nothing in the intrinsic record to suggest that 'sleep mode' should be construed to have a different scope than 'low power mode.'" (*See* D.I. 441, p. 45). As Plaintiff acknowledges, in *Pickholtz*, the court gave "computer system" and "computer" the same construction when "computer system" appeared only in the specification and "computer" appeared only in the claims. 284 F.3d at 1373. Whereas adopting the same construction for "computer system" and "computer" in *Pickholtz* rendered the word "system" in the claims surplusage, it did not render the claim circular. Here, by contrast, adopting the same

construction for "low power mode" and "sleep mode" would render the entire additional limitation of claim 6 of the '730 patent circular, and therefore surplusage, and there would be no difference in claim scope between independent claim 1 and dependent claim 6.

Additionally, I find that the specification here does not clearly indicate that "low power mode" and "sleep mode" have the same meaning. Though Plaintiff's citation to the specification's references to "low power sleep mode" are consistent with the interpretation that "low power mode" and "sleep mode" have the same meaning, they are also consistent with the interpretation that "low power mode" is an intermediate mode between "full power mode" and "sleep mode." Considering the common specification and claim 6 of the '730 patent together, I conclude that "low power mode" is a broader term than "sleep mode." A transceiver in "sleep mode" is necessarily in a "low power mode," because placing a component of a transceiver in "sleep mode" comprises placing that component in "low power mode." ('730 patent, claim 6).

Plaintiff also argues limiting "sleep mode" to a mode in which no content is transmitted or received is inappropriate for the same reasons discussed with respect to the term "low power mode." Defendants counter that each of the specification's disclosures of "sleep mode" "state that transmission or reception of data does not occur," and they note that in the MoCA cases, Plaintiff agreed to construe "data" as "content" in the '268 patent. (D.I. 441, pp. 53-54; *see* C.A. No. 15-611, D.I. 214, p. 21).

First, whereas claims in the related '268 patent explicitly define "low power mode" in terms of data transmission, no claims in the '268, '730, '382, '753, or '404 patents explicitly define "sleep mode" in terms of data transmission. This supports the inference that when the patentee intended to claim "low power mode" in terms of content transmission, the patentee explicitly did so, and further that any omission of a data transmission limitation in defining "low power mode"

was intentional. One cannot infer that the patentee intentionally omitted a data transmission limitation from the asserted "sleep mode" claims, however, because none of the other claims define "sleep mode" in terms of data transmission. I thus do not find convincing the argument that the patentee knew how to draft claims defining "sleep mode" in terms of data transmission, and consciously chose not to do so in the asserted claims.

Second, though Plaintiff argues that using "content" in the construction will import ambiguity into the claim, Plaintiff agreed to construe "data" as "content" in these patents in the MoCA cases, and Plaintiff does not offer any explanation for its change in position. I do not find Plaintiff's argument compelling.

Third, I find the specification consistent with limiting "sleep mode" to a mode in which no content is transmitted. The specification consistently describes "sleep mode" as a mode in which a transceiver is not needed for data transmission and reception. ('730 patent at Abstract ("A multicarrier transceiver is provided with a sleep mode in which it idles with reduced power consumption when it is not needed to transmit or receive data."), 5:52-57 ("It is thus desirable that the transceiver be able to suspend operations and enter a 'sleep' mode in which it consumes reduced power when it is not needed for data transmission or reception"), 6:39-42 ("If entrance into sleep mode is permissible at this time, the CO transceiver responds to the power down or idle signal by transmitting an 'Acknowledge Sleep Mode' notification (step 84) to the CPE transceiver."), 7:14-18 ("while the link between the CO transceiver and the CPE transceiver is in a sleep state, user data provided by the CO transceiver will be benign idle data"), 7:58-60 ("On waking up from sleep mode, the CPE transceiver can begin transmitting immediately or after only a few frames delay . . ."). The specification also distinguishes "sleep mode" from a "'partial' sleep mode in which only part of each transceiver is powered down." ('730 patent at 8:34-43

(describing an example of "partial sleep mode" where "data transfer is one-way (when, for example, receiving video at the CPE transceiver from the CO transceiver without any upstream data being sent in return to the CO), the CO receiver and the CPE transmitter may operate in the sleep mode, while the CO transmitter and the CPE receiver are operating in full power mode.")). Whereas the specification contemplates content transmission during "partial sleep mode" (e.g., one-way content transmission), the specification does not disclose any content transmission during full "sleep mode." Though the specification identifies "benign idle data such as ATM IdleCells or HDLC Flag octets" as "user data," ('730 patent at 7:13-19), I do not think it is content.

Accordingly, I will construe "sleep mode" to mean "a mode in which the circuitry is not transmitting or receiving content, and the amount of power consumed is less than when operating in full power mode."

3. "synchronization signal"

a. *Plaintiff's proposed construction*: "a signal allowing synchronization between the clock of the transmitter of the signal and the clock of the receiver of the signal"[2]

Plaintiff's original proposed construction: "a signal used to maintain a timing relationship between transceivers by correcting errors or differences between a timing reference of the transmitter of the signal and a timing reference of the receiver of the signal"

b. *Defendants' proposed construction*: "a signal used to establish or maintain a timing relationship between transceivers that does not transmit content"

c. *Court's construction*: "a signal used to establish or maintain a timing relationship between transceivers"

This term appears in the asserted claims of the '404, '730, and '382 patents. The specification does not disclose a "synchronization signal," but it does disclose a "timing reference signal," which the parties agree I should consider in construing "synchronization signal." (D.I.

[2] During oral argument, Plaintiff stated that it would adopt the PTAB's construction as its proposed construction. (D.I. 513 at 71:9-10).

441, pp. 56, 58). During oral argument, Plaintiff proposed that I accept the PTAB's construction for this term from its final written decision in a recent inter partes review proceeding against the '404 patent. (D.I. 513 at 9:2-5, 71:9-10; *see* Arris Group, Inc.[3] v. TQ Delta, LLC, No. IPR2016-01160 (Dec. 13, 2017)). Defendants oppose adopting the PTAB's construction, asserting that this IPR proceeding challenging the validity of the '404 patent considered prior art, whereas claim construction involves an evaluation of the ordinary meaning of the claims. (D.I. 513 at 81:6-9).

I consider the PTAB's final written decision in IPR2016-01160 extrinsic evidence. Though the PTAB has "special expertise in evaluating patent applications," *Kappos v. Hyatt*, 566 U.S. 431, 445 (2012), the PTAB applied the broadest reasonable interpretation standard when it construed "synchronization signal" in IPR2016-01160. (D.I. 451-1 at 6). Accordingly, issue preclusion does not apply, and I am not compelled to adopt the PTAB's construction. *SkyHawke Techs., LLC v. Deca Int'l Corp.*, 828 F.3d 1373, 1376 (Fed. Cir. 2016) ("Because the Board applies the broadest reasonable construction of the claims while the district courts apply a different standard of claim construction as explored in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), the issue of claim construction under *Phillips* to be determined by the district court has not been actually litigated.").

In IPR2016-01160, the petitioner relied on the teaching of a "synchronization frame" in two asserted references to argue that the "synchronization signal" limitation of the '404 patent was present in the prior art. (D.I. 451-1 at 15-16). The PTAB's preliminary construction of "synchronization signal" adopted Petitioner's proposed construction—"a signal allowing frame synchronization between the transmitter of the signal and the receiver of the signal". (*Id.* at 7).[4]

[3] Arris Group, Inc. is not a party in the cases at issue here.

[4] TQ Delta proposed that the PTAB adopt the same construction that TQ Delta proposed in the MoCA cases—"an indication used to establish or maintain a timing relationship between transceivers." (D.I. 451-1 at 7; *see* C.A. No. 15-611, D.I. 214, p. 19).

Responding to petitioner's argument, TQ Delta asserted that the PTAB's preliminary construction was incorrect, because, "the recited 'synchronization signal' cannot encompass frame synchronization because the claims separately recite a 'synchronization frame,' which provides frame synchronization." (*Id.* at 7-8). The PTAB agreed with TQ Delta on this point, but declined to adopt TQ Delta's proposed construction for "synchronization signal," because the PTAB concluded that the "timing relationship" recited in TQ Delta's proposed construction "is arguably broad enough to encompass the timing of superframe boundaries and, therefore, encompass the very same frame synchronization that Patent Owner tries to distinguish." (*Id.* at 10). The PTAB's final written decision modified the preliminary construction for "synchronization signal," construing the term to mean, "a signal allowing synchronization between the clock of the transmitter of the signal and the clock of the receiver of the signal." (*Id.* at 10-11).

I decline to adopt the PTAB's construction for "synchronization signal." First, the PTAB's construction does not appear to be based on a clear factual finding that a "timing relationship" would necessarily encompass a "synchronization signal." Second, the parties to this litigation have not raised the arguments on which the PTAB relied in formulating its construction for "synchronization signal."

Even evaluating the claims under the broadest reasonable interpretation standard, the PTAB did not unequivocally state that the "timing relationship" in TQ Delta's construction was broad enough to encompass a "synchronization frame." Instead, the PTAB found that "timing relationship" was only "arguably broad enough to encompass" the "synchronization frame" TQ Delta sought to distinguish.

The PTAB's construction rested in large part on TQ Delta's arguments that it was necessary to differentiate "synchronization signal" from "synchronization frame" in order to avoid

duplicative claim language. Though Plaintiff submitted the PTAB's final written decision as supplemental authority relevant to this term, Plaintiff's letter explaining the relevance of the final written decision made no mention of a "synchronization frame." (*See* D.I. 451). Nor did Plaintiff raise any argument about distinguishing a "synchronization signal" from a "synchronization frame" in briefing[5] or during oral argument. (*See* D.I. 441, pp. 5, 10-11, 14, 104-05; D.I. 513). Thus, Defendants have not had an opportunity to respond to the argument that I should adopt the PTAB's construction on the grounds that a "synchronization signal" must not be construed to include a "synchronization frame," because Plaintiff has not raised it in this proceeding.

Additionally, I conclude that by reciting the clocks of the transceivers to the exclusion of other transceiver components, the PTAB's construction for "synchronization signal" may suggest to a jury that other transceiver components do not interact with the synchronization signal to produce synchronization between the transceivers. The specification suggests, however, that other transceiver components (such as the phase-lock loop ("PLL")) interact with the synchronization signal to achieve synchronization between the transceivers. ('404 patent at 5:48-49 ("The PLL 62 locks itself to this signal and drives clock 30 in synchronism with the Master Clock in the driving transmitter."), 5:59-61 ("Controller 32 controls the switching of the input to PLL 62 between these two sources so that the PLL 62 remains locked to the CO transceiver timing reference.")). This disclosure suggests that synchronization involves components of the transceivers beyond just the clocks—the PLL is an intermediary between the CO transceiver master clock and the CPE transceiver clock. Though it may be true that the "synchronization signal" ultimately effectuates

[5] Plaintiff's briefing contains several instances of "synchronization frame," but none of them argue that a "synchronization frame" must be different from a "synchronization signal." (D.I. 441, pp. 5 (expert declaration asserting the function of the "synchronization frame"), 10-11 (including "synchronization frame" in a recitation of claims 1 and 6 of the '404 patent), 14 (listing the agreed-upon construction for "synchronization frame"—"a frame that indicates a superframe boundary"), 104-05 (citing the specification's discussion of "synchronization frame" to argue that a "frame counter" was a well-known structure)).

synchronization between the clocks of the transceivers, I decline to adopt a construction that may suggest to a jury that other components of the transceivers do not interact with the "synchronization signal."

Turning to Defendants' proposed construction, Defendants argue that their proposal comports with the plain and ordinary meaning of "synchronization signal." (D.I. 441, p. 58). As support, Defendants cite extrinsic evidence in the form of an IEEE definition for "synchronizing signal," which defines the term as "a special signal which may be sent to establish or maintain a fixed relationship in synchronous systems." (*Id.* (citing D.I. 442-1 at 106)). Defendants maintain that the specification's discussion of synchronization in the normal state ('730 patent at 5:19-27) and the idle state ('730 patent at 6:67-7:12) comports with the plain and ordinary meaning from the IEEE definition. (D.I. 441, p. 58).

Plaintiff asserts that Defendants' use of the disjunctive "or" in their proposed construction is improper because the construction could then read on a synchronization signal that establishes, but does not maintain, synchronization, when "the asserted claims of the '382 and '730 patents recite that the 'synchronization signal' is used to 'maintain synchronization' between transceivers in the sleep mode." (D.I. 441, pp. 62-63). During oral argument, Plaintiff further asserted that Defendants' proposed construction is improper for being too broad—it lacks any information about "what timing relationship means," and could cover a single communication about timing between transceivers without any continuing synchronization relationship. (D.I. 513 at 71:17-72:8). According to Plaintiff, there is "nothing in the patent specification that would contemplate covering such a broad concept of synchronization." (*Id.* at 71:23-72:8). Defendants respond, "The specification uses timing reference and therefore it has left it broad, to be a broad determination of synchronization signal." (*Id.* at 81:10-13).

I agree with Defendants. The parties agree that the "timing reference signal" disclosed in the specification is informative in construing "synchronization signal." "Timing reference signal" is a broad term that could encompass many different embodiments. It seems to me internally consistent to say that the specification's broad "timing reference signal" serves a broad function of "establishing or maintaining a timing relationship." Though Plaintiff has asserted that "timing relationship" is too broad, Plaintiff has not offered a narrowing construction aside from the PTAB's construction. Additionally, both Plaintiff's original proposed construction and its proposed construction during the PTAB proceedings contained the same reference to "timing relationship." Plaintiff points out that the IEEE definition for "synchronizing signal" recites "establish[ing] or maintain[ing] a fixed relationship." Despite Plaintiff's argument, it is not clear to me that "a fixed relationship" is narrower than "a timing relationship."

I also agree with the recitation of "establish or maintain" in Defendants' proposed construction. Plaintiff's argument that the '730 and '382 patents require that the "synchronization signal" "maintain" synchronization is not compelling. First, since the asserted claims of the '404 patent contain no such recitation, the asserted patents do not uniformly and expressly require that a "synchronization signal" maintain synchronization. (*See, e.g.*, '404 patent, claim 1). Though claim 1 of the '404 patent twice recites transmitting a "synchronization signal," it does not necessarily follow that the synchronization signal transmitted must be limited to a synchronization signal that maintains (as opposed to establishes) synchronization. Second, the IEEE definition recites "establish[ing] or maintain[ing] a fixed relationship." The IEEE definition, combined with the patentee's choice in the '730 and '382 patents to explicitly claim "maintaining synchronization . . . using a synchronization signal" support the conclusion that a POSA would

not have understood "synchronization signal" to be limited to signals that "maintain" synchronization.

The parties also dispute whether a "synchronization signal" should be limited to a signal that does not transmit content. Defendants rely on the unsupported testimony of their expert that the "synchronization signal" does not transmit content. (D.I. 441, p. 59). The expert's declaration cites only a portion of the patent discussing synchronization when the transceivers are in the idle state, failing to address synchronization when the transceivers are operating in the normal/full power mode. (*See* D.I. 442-1 at 505 (Heegard Dec., ¶ 43) (citing only '730 patent at 7:8-12)). Plaintiff points out that neither the IEEE definition nor the specification contains a limitation that a "synchronizing signal" cannot transmit content, nor do they even mention content. (D.I. 441, pp. 61-62). According to Plaintiff, Defendant's proposed construction should not be adopted because importing the "content" limitation unnecessarily "injects ambiguity" into the meaning of "synchronization signal." (*Id.* p. 57).

On this point, I agree with Plaintiff. Defendants rely entirely on their expert's unsupported declaration to justify their proposed "content" limitation, and neither the IEEE definition nor the specification appears to support a limitation based on "content." I therefore decline to import a "content" limitation into the construction of this term.

Accordingly, I will construe "synchronization signal" to mean "a signal used to establish or maintain a timing relationship between transceivers."

4. **"means responsive to a sleep mode command for: (1) storing selected state parameters characteristic of the communications channel over which the transceiver is operating; and (2) reducing power to the selected portions of transceiver circuitry"**

a. *Plaintiff's proposed construction*: Governed by 35 U.S.C. § 112 ¶ 6

The means language is "means responsive to a sleep mode command for"

Function: "(1) storing selected state parameters characteristic of the communications channel over which the transceiver is operating, and (2) reducing power to selected portions of the transceiver circuitry"

Structure for function (1): "a memory"
Structure for function (2): "a controller implementing (1) an algorithm for a transceiver that includes the steps of reducing or cutting off power to digital modulator/demodulator portions of the transmitter and receiver sections and reducing power to parts of the analog circuitry, or (2) an algorithm for a transceiver that includes the steps of reducing power to digital modulator/demodulator circuitry as well as to transmitter data line drivers"

b. *Defendants' proposed construction*: Governed by 35 U.S.C. § 112 ¶ 6

Function: "(1) storing selected state parameters characteristic of the communications channel over which the transceiver is operating in response to a sleep mode command, and (2) reducing power to selected portions of the transceiver circuitry in response to a sleep mode command"

Structure: "the controller of the first transceiver that receives a sleep mode command and (1) stores its state in its own state memory corresponding to the state memory of the second transceiver, and (2) reduces or cuts off power to the digital modulator/demodulator portions and/or parts of the analog circuitry, as well as to transmitter data line drivers, of the transmitter and receiver sections of the first transceiver"

c. *Court's construction*:[6] Governed by 35 U.S.C. § 112 ¶ 6

The means language is "means responsive to a sleep mode command for"

Functions: "(1) storing selected state parameters characteristic of the communications channel over which the transceiver is operating, and (2) reducing power to selected portions of the transceiver circuitry"

[6] The asserted claims include the "means responsive to a sleep mode command for" language as a limitation, and I intend for that language to remain a limitation in my construction. The parties' proposed order for submission to the jury should be consistent with including the "responsive to" language as a limitation.

Structures:
for function (1): "a state memory connected to a controller, wherein the controller stores the transceiver's state in the state memory"
for function (2): "a controller implementing (1) an algorithm for a transceiver that includes the steps of reducing or cutting off power to digital modulator/demodulator portions of the transmitter and receiver sections and reducing power to parts of the analog circuitry, or (2) an algorithm for a transceiver that includes the steps of reducing power to digital modulator/demodulator circuitry as well as to transmitter data line drivers"

This term appears in the asserted claims of the '753 patent. The parties agree that this term is a means plus function term. (D.I. 441, p. 70). They also appear to agree on the functions, and that the functions of the invention are accomplished in response to a sleep mode command, but they disagree as to how to convey this in construing this term. Plaintiff proposes incorporating this limitation in the means language. Defendants place this limitation at the end of the second recited function.

Defendants argue, "Plaintiff's construction could cover situations where th[e] functions occur even without a preceding sleep mode command. (*Id.* p. 79). Plaintiff counters that reading the "responsive to a sleep mode command" language into the functions is improper, because the "responsive to" language "clearly modifies the word 'means,' not the subsequent functional language." (*Id.* p. 81). I agree with Plaintiff that "responsive to a sleep mode command modifies "means," but I think that the phrase also describes how the functions are performed. *Accord Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999) ("[T]he properly identified function of this means-plus-function element [is] signaled by the preposition 'for,' . . . ."); *Alt v. Medtronic, Inc.*, 2005 WL 6225306, at *4 (E.D. Tex. Nov. 30, 2005) ("Responsive to said detected movements indicative of physical exercise" does not describe what function is performed, but rather how the function is performed."). Read in the context of the claim, neither party's proposal omits the "responsive to a sleep mode command" limitation. Claim

1 of the '753 patent incorporates this limitation in means language. I conclude that Plaintiff's proposed means language and function more closely comport with the language of the asserted claims and make clear that both recited functions occur in response to a sleep mode command. Accordingly, I will adopt Plaintiff's proposed means language and functions.

With respect to the first function of "storing selected state parameters characteristic of the communications channel over which the transceiver is operating," Plaintiff argues that the corresponding structure is a memory. (*Id.* p. 71 (citing '753 patent at 5:4-5 ("a State Memory (SM) 36 connected to the controller 32 records the state of the transceiver"), 6:58-60 ("the CO transceiver stores its state in its own state memory corresponding to the state memory 38 of CPE transceiver 10"), 7:25-27 (stating that the CPE transceiver "stores its state (step 94) in state memory 38")))). Citing some of the same portions of the specification, Defendants counter that the specification requires that the transceiver itself perform the "storing" function. (*Id.* pp. 76-77 (citing '753 patent at 6:52-60, 7:24-27)).

I find each of Plaintiff's and Defendants' proposals under-inclusive. The specification discloses a "state memory" as a structure that corresponds to the first recited function, but it is not the only structure that is implicated in performing that function. Each reference to storage of a transceiver's state mentions both a "state memory" and either a "controller" or "transceiver." ('753 patent at 5:4-6, 6:58-60, 7:24-27, 7:55-57). Additionally, the specification discloses that "a State Memory (SM) 36 connected to the controller 32 records the state of the transceiver." (*Id.* at 5:4-6). The specification also makes clear that the "controller" controls the operation of the transceiver. (*Id.* at 4:49-51 (disclosing a clock that "supplies input to a Controller 32 which controls the individual units of the transmitter"), 5:25-27 ("The controller 32 also controls the operation of the receiver portion 16 of the transceiver 10"), 5:43-44 ("Control of the receiver

section is provided by the controller 32")). Additionally, for the same reason discussed with respect to the parties' proposed functions, I decline to import a limitation into the structure for either function that limits the controller to a "controller of the first transceiver that receives a sleep mode command." Therefore, I will construe the corresponding structure for the first function to be "a state memory connected to a controller, wherein the controller stores the transceiver's state in the state memory."

With respect to the second function of "reducing power to selected portions of the transceiver circuitry," the parties agree that the corresponding structure is a controller and its algorithms for reducing power. The parties also agree that the algorithm or algorithms for a controller include the steps of "reducing or cutting off power" to (1) "the digital modulator/demodulator [portions/circuitry]," (2) "[portions/parts] of the analog circuitry," and (3) "transmitter data line drivers." (D.I. 441, p. 70). They disagree, however, regarding what exactly the algorithm requires. Plaintiff asserts that Defendants' proposed structure for the function of reducing power is flawed because it "requires steps that the specification describes only the CPE as performing, *i.e.*, reducing or cutting off power to the line drivers." (*Id.* p. 84 (emphasis omitted)). Defendants do not dispute that the algorithm in their proposed structure requires reducing or cutting off power to the line drivers, but they respond, "Plaintiff is wrong," and assert that their proposed structure for the function of reducing power "covers the CPE embodiment." (*Id.* p. 89). Despite their assertions that Plaintiff is wrong, Defendants do not provide any argument regarding whether their proposed structure for the function of reducing power covers the CO embodiment. (*See id.*). Defendants also assert that Plaintiff's algorithm is insufficient because, rather than providing sufficient structure, it merely restates the function of reducing power. (*Id.* pp. 87-88). Plaintiff disputes this characterization, pointing to the

algorithm's recitation of "digital modulator/demodulator portions," "parts of the analog circuitry," and "transmitter data line drivers." (*Id.* p. 85).

I agree with Plaintiff. In a paragraph discussing the CO transceiver's transition to sleep mode, the specification states that the CO transceiver

> may, at this time, perform its own power reduction. In particular, it may reduce or cut off power to the digital modulator/demodulator portions of its transmitter and receiver sections (corresponding to the IFFT 20 and FFT 56 of the CPE transceiver, FIG. 1); this provides a significant power reduction. Further, it may reduce power to parts of the analog circuitry. Power will be maintained, of course, to at least that portion of the analog driver circuitry which transmits the pilot tone and other control signals to the CPE transceiver, and to line circuits required to monitor the line 14 for signals from the CPE transceiver.

('753 patent at 7:6-17). Notably, the specification does not disclose that the CO transceiver reduces power to transmitter data line drivers during its transition to sleep mode. In a discussion of the CPE transceiver's transition to sleep mode, the specification discloses, "The CPE transceiver 10 then reduces power to the digital modulator/demodulator circuitry comprising IFFT 20 and FFT 56, as well as to and [*sic*] transmitter data line drivers 26." (*Id.* at 7:35-37). The parties do not appear to dispute that Defendants' proposed algorithm requires reducing power to the transmitter data line drivers. (*See* D.I. 441, pp. 84, 89). Thus, Defendants' proposed structure for the "reducing power" function appears to impose a limitation on the CO transceiver that the specification does not recite. By contrast, Plaintiff's proposed algorithm accounts for the specification's different disclosures for the steps taken by each of the CO transceiver ("reduc[e] or cut off power to the digital modulator/demodulator" and "reduc[e] power to parts of the analog circuitry") and the CPE transceiver ("reduc[e] power to the digital modulator/demodulator circuitry as well as to transmitter data line drivers") when entering sleep mode.

Though Defendants are correct that the positions of the transceivers may be switched when entering into sleep mode (*i.e.*, the CPE transceiver may perform the steps attributed to the CO

transceiver and vice versa ('753 patent at 8:27-33)), one of the transceivers must still perform the steps attributed by the specification to the CO transceiver, and the other transceiver must perform the steps attributed by the specification to the CPE transceiver. The specification does not disclose any embodiment in which each of the CO transceiver and the CPE transceiver may or must perform the steps attributed by the specification to the CPE transceiver.

Therefore, I conclude that the specification does not support Defendants' proposed structure for the "reducing power" function. I will adopt Plaintiff's proposed structure for the "reducing power" function.

5. "means responsive to a wake-up command for: (1) restoring power to said transceiver; (2) restoring the state of said transceiver from said sleep mode by means of said stored parameters"

a. *Plaintiff's proposed construction*: Governed by 35 U.S.C. § 112 ¶ 6

The means language is "means responsive to a wakeup command for"

Function: "(1) restoring power to said transceiver, and (2) restoring the state of said transceiver from said sleep mode by means of said stored parameters"

Structure: "a controller implementing (1) an algorithm for a CO transceiver that includes the steps of retrieving the CO's stored state from its memory and restoring full power to its circuitry, or (2) an algorithm for a CPE transceiver that includes the steps of retrieving the CPE's stored state from its memory and restoring full power to its circuitry"

b. *Defendants' proposed construction*: Governed by 35 U.S.C. § 112 ¶ 6

Function: "restoring power to said transceiver and restoring the state of said transceiver from said sleep mode by means of said stored parameters by using said stored parameters in response to a wake up command"

Structure: "The first transceiver that receives a wake-up command and in response transmits an exiting sleep mode signal to the second transceiver, retrieves its stored state from the state memory, restores full power to its circuitry, and restores the output of the Fast Fourier Transform to the input of the phase-lock loop"

c. *Court's construction*: Governed by 35 U.S.C. § 112 ¶ 6

The means language is "means responsive to a wake-up command for"

Function: "(1) restoring power to said transceiver, and (2) restoring the state of said transceiver from said sleep mode by means of said stored parameters"

Structure: "a controller implementing (1) an algorithm for a CO transceiver that includes the steps of retrieving the CO's stored state from its memory and restoring full power to its circuitry, or (2) an algorithm for a CPE transceiver that includes the steps of retrieving the CPE's stored state from its memory and restoring full power to its circuitry"

This term appears in the asserted claims of the '753 patent. The parties agree that this term is drafted as a means-plus-function claim, and appear generally to agree on the function. (D.I. 441, p. 89). They disagree, however, regarding the appropriate structure.

The parties generally agree as to the functions. They agree that the first function is "restoring power to said transceiver." With respect to the second function, they agree that it is "restoring the state of said transceiver from said sleep mode." The parties also appear to agree that the functions of the invention are accomplished in response to a wake-up command, but they disagree as to how to convey this in construing this term. Plaintiff proposes incorporating this limitation in the means language. Defendants place this limitation at the end of the second recited function. In the context of the claim, neither party's proposal omits the "responsive to a wake-up command" limitation. Claim 1 of the '753 patent incorporates this limitation in means language. I conclude that Plaintiff's proposed means language and function more closely comports with the language of the asserted claims and makes clear that both recited functions occur in response to a wake-up command. Accordingly, I will adopt Plaintiff's proposed means language and functions.

Defendants argue, "Plaintiff's proposed structure merely recites the function and is no algorithm at all. (*Id.* p. 93). Defendants further assert that their proposal "complies with the only embodiment provided in the specification, and acknowledges the interchangeability of the CO and

the CPE by using 'first' and 'second' transceiver." (*Id.* pp. 93-94). According to Defendants, Plaintiff ignores "the co-dependence of the transceivers in the specification and the specification's clear instruction that the CO and CPE transceivers are interchangeable." (*Id.* p. 94).

Plaintiff responds that though its proposed "algorithm is similar to the function, it is not a restatement of that function." (*Id.* p. 96). According to Plaintiff, Plaintiff's proposed algorithm's steps of "restoring full power to the circuitry" and "retrieving the stored state from the transceiver's memory" represent key differences from the functions of "restoring power to said transceiver" and "restoring the state of said transceiver from the sleep mode by means of said parameters," respectively. (*Id.*). Plaintiff further argues that since the portion of Defendants' proposed algorithm that requires transmitting an exiting sleep mode signal "does not 'restore power' or 'restore the state of said transceiver,'" it fails to qualify as "structure corresponding to those claimed functions." (*Id.* p. 97). Additionally, Plaintiff maintains that its proposed structure separates the algorithm into steps for the CO and the CPE because the specification does the same. (*Id.* pp. 97-98). Plaintiff contends, "by requiring the structure to include 'transmitting an exiting sleep mode signal,' Defendants' structure excludes one of the transceiver embodiments disclosed in the specification," because "even if the CO and CPE are reversed in Figure 2, only one of the transceivers transmits the exit sleep mode signal—the other one receives it." (*Id.* p. 97). Finally, Plaintiff argues that Defendants' proposed step of "restoring the output of the Fast Fourier Transform to the input of the phase-lock loop" does not "restore power to the transceiver," or "restore the state of the transceiver from the sleep mode by means of the stored parameters, and is thus improper." (*Id.* p. 98).

I agree with Plaintiff.

Regardless of whether the CO transceiver and the CPE transceiver are interchangeable, I conclude that Defendants' proposed structure does not correspond with the claimed functions. I have construed the functions as, "(1) restoring power to said transceiver, and (2) restoring the state of said transceiver from said sleep mode by means of said stored parameters." To support their proposed structure, Defendants cite an embodiment in the specification where, "In response to the 'Awaken' signal, the CPE transceiver retrieves its stored state from the state memory 38; restores full power to its circuitry; and restores the output of the [Fast Fourier Transform] 56 to the input of the PLL 62." ('753 patent at 7:55-59). This disclosure in the specification recites three functions, whereas claim 1 of the '753 patent recites only the first two—"(1) restoring power to said transceiver; [and] (2) restoring the state of said transceiver from said sleep mode by means of said stored parameters." ('753 patent, claim 1). I thus conclude that Defendants' proposal does not recite the corresponding structure inasmuch as it includes, "restor[ing] the output of the [Fast Fourier Transform] 56 to the input of the PLL 62." *See JVW Enters., Inc. v. Interact Accessories, Inc.*, 424 F.3d 1324, 1331 (Fed. Cir. 2005) ("[A] court errs by importing the functions of a working device into the[ ] specific claims, rather than reading the claims for their meaning independent of any working embodiment.") (citation omitted) (second brackets in original).

Additionally, I conclude that Plaintiff's proposed structure corresponds with the claimed functions. First, Plaintiff's proposal identifies the structure implementing the algorithms as a "controller." This comports with the specification's disclosures that a clock "supplies input to a Controller 32 which controls the individual units of the transmitter" ('753 patent at 4:49-51); "The controller 32 also controls the operation of the receiver portion 16 of the transceiver 10" (*id.* at 5:25-27); and, "Control of the receiver section is provided by the controller 32" (*id.* at 5:43-44). Second, I find Plaintiff's inclusion of two structures (one for the CO transceiver, and one for the

CPE transceiver) consistent with the specification, which discusses the CO transceiver and the CPE transceiver separately. Figure 2 makes clear that in transitioning from sleep mode to full data transmission, each of the CO transceiver and the CPE transceiver perform the functions of "restore state" and "restore power." The specification also discloses an embodiment in which "instead of initiating sleep mode at the CPE transceiver as shown in FIG. 2, the CO transceiver may initiate sleep mode. In such a case, the flow of notifications will be as shown in FIG. 2, but with the positions of CO and CPE transceivers reversed." ('753 patent at 8:29-33). Thus, the specification makes clear that each of the CO transceiver and the CPE transceiver can respond to a wake-up command by "restoring state" and "restoring power."

Accordingly, I will adopt Plaintiff's proposed construction for the corresponding structure.

6. "means for maintaining a common, synchronized data frame count between said transceiver and a remote transceiver with which it communicates, to thereby facilitate restoration of communication without reinitialization of said transceiver"

a. *Plaintiff's proposed construction*: Governed by 35 U.S.C. § 112 ¶ 6

The means language is "means for"

Function: "maintaining a common, synchronized data frame count between said transceiver and a remote transceiver with which it communicates"

Structure: "a clock and frame counter"

b. *Defendants' proposed construction*: Governed by 35 U.S.C. § 112 ¶ 6

Function: "maintaining a common, synchronized data frame count between said transceiver and a remote transceiver with which it communicates, to thereby facilitate restoration of communication without reinitialization of said transceiver"

Structure: indefinite

c. *Court's construction*: Governed by 35 U.S.C. § 112 ¶ 6

Function: "maintaining a common, synchronized data frame count between said transceiver and a remote transceiver with which it communicates"

Structure: "a clock and frame counter"

This term appears in the asserted claims of the '753 patent. The parties agree that this term is drafted as a means-plus-function claim. (D.I. 441, p. 99). They disagree, however, regarding the appropriate structure and function.

The parties' proposed functions differ in that Defendants' proposed construction incorporates a recitation of the purpose of the function that Plaintiff's proposed construction omits. Plaintiff maintains that the "thereby" clause in Defendants' proposed construction "is an additional claim limitation—it is not a function performed by the claimed means." (*Id.* p. 100). Instead, Plaintiff argues, "The thereby clause is at best a result of the function." (*Id.* p. 107). Defendants assert that the "thereby" clause "recites a functional feature," and is "part of the same function, because it relates to the function of 'facilitat[ing] restoration.'" (*Id.* p. 102 (brackets in original)). I agree with Plaintiff. As an adverb, "thereby" modifies the "maintaining" clause in claim 1 of the '753 patent. A plain reading of the text of claim 1 of the '753 patent thus indicates that the "thereby" clause describes the purpose or result of what it modifies—here, the function of "maintaining a common synchronized data frame count between said transceiver and a remote transceiver with which it communicates." Therefore, I decline to include the "thereby" clause in the function of this claim term.

The parties also disagree regarding the appropriate structure for this term. Whereas Plaintiff argues that the structure is "a clock and frame counter," Defendants contend that the claim is indefinite for the patent's failure to disclose adequate structure. Plaintiff submits that the specification discloses "a clock and frame counter" as the corresponding structure. (*Id.* pp. 100-

01). As support, Plaintiff cites the specification's disclosure that "[a] frame counter (FC) 24 connected to the controller 32 maintains a count of the number of frames of data transmitted from or received by the transceiver 10. The clock 30 maintains the count in counter 34 synchronous with that of a corresponding counter . . . in the CO transceiver." (*Id.* (citing '753 patent at 4:59-63); *see also* '753 patent at 5:39-44 ("The PLL 62 locks itself to this signal and drives clock 30 in synchronism with the Master Clock in the driving transmitter. This also synchronizes frame counter 34 of the CPE transceiver to the corresponding frame counter of the CO transceiver.")).

Plaintiff also identifies extrinsic evidence to support its proposed construction. Citing a 1995 ADSL standard, Plaintiff maintains that "'counters' and the idea of 'counting' frames have been known in the art for a long time," and that "a POSA would have understood that the term 'frame counter' is interchangeable with the well-known term 'symbol counter.'" (*Id.* p. 103 (citing D.I. 442-1 at 267, 356)). Plaintiff also cites U.S. Patent No. 5,400,322, filed in 1993, which discloses "a transmission system using multicarrier modulation, comprising: a transmitter . . . the transmitter including a transmitted symbol counter for counting transmitted symbols." (*Id.* p. 104 (citing D.I. 442-1 at 433 (U.S. Pat. No. 5,400,322 at 3:53-60))).

Defendants respond that the specification fails to disclose adequate corresponding structure because it "mainly states that a functional 'black box' type 'Frame Counter (FC) connected to the controller maintains a count of the number of frames.'" (*Id.* p. 101 (citing '753 patent at 4:59-63)). Defendants liken the specification's clock and frame counter to a general purpose computer that fails to disclose an algorithm, citing only their expert's unsupported declaration. (*Id.* pp. 101-02). According to Defendants, I should also discount Plaintiff's extrinsic evidence because the ADSL standard and the patent cited by Plaintiff "perform counting in different ways, one by counting a superframe, the other by counting the loss of frame synchronization." (*Id.* p. 108).

Plaintiff submits that Defendants' expert's statement that a frame counter is not a term known in the art "conflicts with other statements in his declaration." (*Id.* p. 105). For example, Defendants' expert states,

> A system can be synchronized in multiple ways using a synchronization signal. The synchronization signal can be as simple as a pilot tone with a set frequency and bandwidth that is sent directly to both ends of the system or used in conjunction with a phase lock loop (PLL) or frame counter, as described in the [common] specification."

(D.I. 442-1 at 504). Defendants respond that their expert's declaration is not contradictory because it "was simply referring to the statements in the specification, and was not acquiescing in any way [or] suggesting that a 'frame counter' was a known structure in the art." (D.I. 441, p. 109).

I agree with Plaintiff. I do not find compelling Defendants' suggestion that a frame counter could not have been known in the art simply because counting may be performed in different ways. Additionally, I find Defendants' response to Plaintiff's argument about the inconsistencies in Defendants' expert's report lacking. Defendants' response essentially amounts to an assertion that their expert did not acknowledge that a frame counter was known in the art because he did not explicitly state that proposition. But by stating, "A system can be synchronized in multiple ways using a synchronization signal," including a "pilot tone with a set frequency and bandwidth . . . used in conjunction with a phase lock loop (PLL) or frame counter," Defendants' expert implicitly acknowledged that a POSA could use a frame counter to maintain synchronization in a system. (*See* D.I. 442-1 at 504). Notably, Defendants' expert apparently did not see a need to describe how a frame counter works to maintain synchronization in great detail. Further, Defendants' expert's reference to the common specification follows his recitation of the frame counter's use in synchronization, and reads, "as described in the specification." (*Id.*). This suggests that the specification is consistent with what precedes the phrase, "as described in the specification," not

that the expert is merely restating what is contained in the specification. Accordingly, I will construe the corresponding structure to be "a clock and frame counter."

7. **"a synchronizer module that uses a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode"**

Plaintiff's proposed construction	**Defendants' *alternative* construction**
Not governed by 35 U.S.C. § 112 ¶ 6 "a class of hardware and/or software structures, including a clock, that generates a synchronization signal or receives and uses a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode"	*If the Court finds that the claim is not governed by 35 U.S.C. § 112 ¶ 6*: "a hardware component that is operable to use a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode"
Plaintiff's *alternative* construction	**Defendants' proposed construction**
If the Court finds that the claim is governed by 35 U.S.C. § 112 ¶ 6: Function: "using a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode" Structure: "(1) for the CO transceiver, a clock and IFFT, or (2) for the CPE transceiver, a clock and PLL"	Governed by 35 U.S.C. § 112 ¶ 6 Function: "using a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode" Structure: indefinite

Court's construction: Not governed by 35 U.S.C. § 112 ¶ 6

"a class of hardware structures, or hardware and software structures, including a clock, that generates a synchronization signal or receives and uses a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode"

This term appears in the asserted claims of the '730 patent. "Synchronizer module" presumptively is not subject to construction under § 112 ¶ 6 because it does not recite the word "means." *See Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015). "[T]he presumption can be overcome and § 112, para. 6 will apply if the challenger demonstrates that the claim term fails to 'recite sufficiently definite structure' or else recites 'function without reciting sufficient structure for performing that function.'" *Id.* at 1349 (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)). "What is important is . . . that the term, as the name for structure, has a reasonably well understood meaning in the art." *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996).

Plaintiff raises the same arguments here as it did in connection with Family 1 to support the proposition that "'module,' in the context of the telecommunications field, denotes sufficient structure that § 112, ¶ 6 is not invoked." (D.I. 441, p. 111 (citation omitted)). For the same reasons discussed in my Family 1 claim construction opinion, I disagree. (*See* D.I. 468, pp. 20-21).

Relying on their expert's unsupported declaration, Defendants argue that the term "synchronizer module" is subject to § 112, ¶ 6 because it "is not an actual structure and it is not used in common parlance by a POSA." (D.I. 441, p. 115 (citing D.I. 442-1 at 512)). According to Defendants, Plaintiff's proposed construction supports this interpretation, because it does not identify "any known structures or even reasonably defined class of structures," instead reciting "a 'class of hardware and/or software structures' that are then only limited by the function they will be called on to perform." (*Id.* p. 116). This is "meaningless," Defendants submit, because "everything in the field of the patent can be categorized as either a hardware or software structure." (*Id.* p. 124 (emphasis omitted)). During oral argument, Defendants argued, "The word 'synchronizer' does not appear in these patents. There's not even a black box that is labeled

synchronizer" that supports Plaintiff's argument that "synchronizer module" recites sufficient structure." (D.I. 513 at 91:23-25). Pointing to the different embodiments in the specification for sleep mode and full power mode, Defendants argue that since "there are multiple solutions for synchronization within the[] figures" of the patent, a synchronization module cannot recite sufficient structure. (D.I. 513 at 92:8-93:8; *see also id.* at 93:9-11 ("[Plaintiff is] not even saying in [its] own specification that there's one set of circuitry that performs synchronization.")).

Plaintiff responds with three arguments. First, Plaintiff offers extrinsic evidence to support the assertion that "synchronizer" was a term known and understood in the art as early as 1973. (D.I. 453). For example, a 1983 undergraduate thesis "describes a synchronizer that exhibits an arbitrarily low failure rate with a short average propagation delay for the special case of synchronizing a signal that is synchronous with some periodic signal to which the synchronizer has access," and it includes a schematic for a "minimum-average-latency synchronizer." (D.I. 453-1 at 3, 19 (emphasis omitted)). The references section of the thesis includes several academic articles dating back to 1973 that discuss issues in synchronizer and synchronizer circuit operation. (*Id.* at 20). According to Plaintiff, the "class of hardware or software" in its proposed construction is proper because it "would contemplate covering th[e] types of structures" in the different types of synchronizers referenced in the 1983 thesis. (D.I. 513 at 88:9-15). Defendants contend that Plaintiff's extrinsic evidence should be discounted because the author of the thesis is not a POSA, and the thesis is not in the context of the relevant DSL technology—rather, it contains a generic discussion of synchronization. (*Id.* at 96:6-12). Further, Defendants submit, the thesis represents an attempt to design a synchronizer, not a recognition that there was "one well-known structure that constitutes a synchronizer." (*Id.* at 96:12-22).

Second, Plaintiff submits that Dr. Heegard's statements regarding "synchronizer module" are inconsistent with his statements regarding "synchronization signal." (D.I. 513 at 88:16-89:16). Regarding "synchronizer module," Dr. Heegard stated that since "there is no structure, a POSA would define the claimed synchronizer module by the recited function of 'us[ing] a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver.'" (D.I. 513 at 88:16-21 (citing D.I. 442-1 at 512)). Regarding "synchronization signal," however, Dr. Heegard stated, "A POSA would understand that there are various ways to implement a synchronization signal to establish or maintain a timing relationship." (D.I. 442-1 at 504; D.I. 513 at 88:22-25; *see also* D.I. 442-1 at 504 ("Considering a synchronization signal is a common and basic aspect of all electronic devices, a POSA would know how to create a synchronization signal in the best manner for the particular device, and would not need to be told a specific method.")). The logical implication of Dr. Heegard's testimony, Plaintiff maintains, is that a POSA would recognize "synchronizer module" as sufficient structure, because a POSA would define "synchronizer module" by its recited function of "using a synchronization signal . . . ," and "a POSA would know how to create a synchronization signal in the best manner for the particular device." (D.I. 513 at 89:4-20). Accordingly, Plaintiff argues, Dr. Heegard's testimony on "synchronizer module" should be given little weight.

Third, Plaintiff contends that Defendants' "class of hardware and/or software" critique "ignores the fact that [Plaintiff's] construction also includes a clock and further explains that the hardware and/or software generates a synchronization signal and receives and uses a synchronization signal." (D.I. 441, p. 120). Additionally, Plaintiff relies on its expert's unsupported declaration to assert that "the specification makes clear that the software/hardware

uses the synchronization signal by generating a signal with an IFFT and receiving the signal with a PLL." (*Id.* p. 119).

I agree with Plaintiff that "synchronizer module" recites sufficiently definite structure, and that § 112, ¶ 6 therefore does not apply. The mere presence of a word like "module" or "component" does not necessarily mean that a claim is governed by § 112, ¶ 6. An adjective, for example, can give sufficient structure to a word like "module" or "component."

Defendants appear to rely exclusively on Dr. Heegard's declaration to support their contention that "synchronizer module" fails to recite sufficiently definite structure. (D.I. 441, pp. 116, 123-24). I find Dr. Heegard's assertion, "a POSA would know how to create a synchronization signal in the best manner for a particular device," inconsistent with his assertion that "synchronizer module," which Dr. Heegard acknowledges "use[s] a synchronization signal to maintain synchronization," would not connote sufficient structure to a POSA. That a "synchronizer module" could be implemented in more than one way does not mean that the term does not connote sufficient structure to a POSA. *Power Integrations, Inc. v. Fairchild Semiconductor Intern., Inc.*, 711 F.3d 1348, 1365 (Fed. Cir. 2013) ("The district court expressed concern that an ordinarily skilled artisan would not know the precise structures for a soft start circuit, because the function of a soft start circuit can be achieved in a variety of ways. Yet we require only that the claim term be used in common parlance or by ordinarily skilled artisans to designate *sufficiently definite* structure, even if the term covers a broad class of structures.") (citations omitted). Though Plaintiff's extrinsic evidence may not be conclusive, it at least provides some support for the notion that "synchronizer" was used in common parlance before the relevant date.

Regardless of the strength of Plaintiff's extrinsic evidence, however, I find that Defendants' sole affirmative argument that "synchronizer module" does not recite sufficiently definite structure is not persuasive. Accordingly, I conclude that Defendants have not rebutted the presumption that § 112, ¶ 6 does not apply to "synchronizer module."

The parties generally agree on the function of a "synchronizer module"—it "uses a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode." (D.I. 441, pp. 109-10). They disagree, however, as to whether the "synchronizer module" can "generate a synchronization signal," and whether the "synchronizer module" must receive a synchronization signal before using it. (*Id.*). They also disagree regarding whether the "synchronizer module" should be limited to "a hardware component," or whether it includes "a class of hardware and/or software structures, including a clock." (*Id.*).

Plaintiff submits that Defendants' proposed construction "is insufficient because it does not specify how the synchronizer module 'uses' the synchronization signal," when the use differs depending on whether the transceiver is transmitting or receiving the "synchronization signal." (*Id.* p. 114). According to Plaintiff, a POSA would know that a "synchronizer module" includes a clock, but a clock element is omitted from Defendants' proposed construction. (*Id.*). Plaintiff further asserts, "[T]he specification makes clear that the software/hardware uses the synchronization signal by generating a signal with an IFFT and receiving a signal with a PLL." (*Id.* p. 119).

Defendants counter that Plaintiff's proposed construction is incorrect, because "software is nowhere disclosed or discussed in the specification," and the claim language does not refer to "generating a synchronization signal." (*Id.* p. 118). Defendants further argue that "everything in

the field of the patent can be categorized as either a hardware or software structure," and that Plaintiff's proposed construction is inappropriate because it "gives two different structures for the same term." (*Id.* p. 124).

I think that the specification contemplates implementations of the invention using software and encompasses the generation of a synchronization signal. For example, the specification discloses, "[I]t is possible to implement major portions of the CPE and CO transceivers in software. In some applications, a dedicated CPU will be used for this purpose." ('404 patent at 8:56-60). This is a clear statement that the invention may be implemented using software. I am not convinced, however, that the invention requires software. Continuing to discuss the CPU embodiment, the specification discloses,

> when the transceivers are implemented in a shared-CPU environment, it may often be necessary to enter an idle mode that is similar to the sleep mode described above in order to maintain synchronization between the transceivers whenever the CPU is unable to service the transceivers. This is accomplished in accordance with the present invention by providing an Interface Transmission Unit (ITU) between the CPU and the data subscriber line which generates an idle indicator whenever the CPU is unavailable for servicing the transceiver . . . .

('404 patent at 8:61-9:3). This disclosure indicates that the "idle mode" is "similar to the sleep mode," the function of the "idle mode" is to "maintain synchronization between the transceivers whenever the CPU is unavailable," and the idle mode is accomplished "by providing an ITU" that "generates an idle indicator whenever the CPU is unavailable." Like the function of the "idle mode" in this embodiment, the function of the "synchronizer module" is to "to maintain synchronization" between transceivers. Accordingly, I think that the "idle indicator" can be analogized to the "timing reference signal" disclosed in sleep mode embodiments in the specification. The parties agree that the "timing reference signal" is an example of a "synchronization signal." Applying the analogy, the "idle indicator" would qualify as a

"synchronization signal" under my construction for that term, insofar as the "idle indicator" appears to be "a signal used to establish and maintain a timing relationship between transceivers." Having concluded that the "idle indicator" qualifies as a synchronization signal, the specification clearly discloses that the "idle indicator" is generated by the ITU in the CPU embodiment of the invention. Since the function of the "synchronizer module" is "to maintain synchronization" between transceivers, I conclude that the specification's disclosure of the CPU embodiment discloses an embodiment in which the "synchronizer module" generates a synchronization signal.

With respect to a clock, I think that a synchronizer module in a first transceiver that functions to synchronize (i.e., establish or maintain a timing relationship) the first transceiver with a second transceiver would include a clock in order to provide a timing reference for the first transceiver. Accordingly, I will construe "synchronizer module" to mean, "a class of hardware structures, or hardware and software structures, including a clock, that generates a synchronization signal or receives and uses a synchronization signal to maintain synchronization between said multicarrier transceiver and a second multicarrier transceiver while said at least one component of said multicarrier transceiver is in the sleep mode."

8. "state parameters characteristic of the communications channel over which the transceiver is operating"

This term appears in the asserted claims of the '753 patent. The parties agreed to construe this term as "state parameters of the kind (but not necessarily having the same values) established by initialization, which are used by the transceiver for transmission and/or reception of data." (D.I. 536). I will adopt the parties' agreed-upon construction.

9. "at least one parameter representative of an operating mode"

10. "at least one parameter representative of a full power mode"

11. "at least one parameter associated with the full power mode operation"

Term 9 appears in the asserted claims of the '730 patent. Term 10 appears in the asserted claims of the '382 patent. Term 11 appears in the asserted claims of the '404 patent. The parties have agreed to construe these terms as "at least one parameter of the kind (but not necessarily having the same value) established by initialization, which is associated with the transmission and/or reception of data during [operating mode/full power mode]." (D.I. 536). I will adopt the parties' agreed-upon constructions.

12. "restore the full power mode by using at the least one parameter and without needing to reinitialize the transceiver"

a. *Plaintiff's proposed construction*: plain and ordinary meaning

b. *Defendant Adtran's proposed construction*: "restores the transceiver to full power mode by retrieving and using the at least one parameter without needing to reinitialize the transceiver"

c. *Court's construction*: plain and ordinary meaning

This term appears in the asserted claims of the '404 patent. Defendant argues that its proposed construction clarifies that a POSA would understand "using" to mean "retrieving and then using the parameter." (D.I. 441, p. 134). According to Defendant, "Retrieving the parameter through the cited 'recovering' or 'restoring' is the only way parameters are able to be used for the claim language as a whole to have meaning and to be consistent with the specification." (*Id.* pp. 134, 136 (citing '404 patent at 7:64-8:13)). Plaintiff counters that since the claim language is clear, it should be given its plain and ordinary meaning, and the term requires no construction. (D.I. 441, p. 133). Plaintiff further argues that Defendant's proposed construction "improperly insert[s] an additional step into the claim language" when nothing in the intrinsic record requires

a "retrieving" step. (*Id.*). According to Plaintiff, whether the parameter can only be used through "retrieving" is irrelevant to construing this term, because the claim limitation at issue "is not directed to what allows the parameter to be used, only that it is used." (*Id.* p. 134 (emphasis omitted)). Plaintiff further asserts, "[A] POSA's understanding of how a parameter is 'used' does not depend on whether the parameter is 'retrieved' or not." (*Id.* p. 135).

I agree with Plaintiff. This term recites "the at least one parameter." ('404 patent at claims 1, 6). These claims earlier recite that the transceivers of the invention "store, in the low power mode, at least one parameter . . . ." (*Id.*). This claim term finds antecedent basis in "at least one parameter" that the claims require be "store[d], in the low power mode." I think it is clear that "the at least one parameter" in this term refers to the same parameter that was earlier stored as required by the language of claims 1 and 6. As Plaintiff points out, claims 1 and 6 of the '404 patent are silent on the mechanics of how "the at least one parameter" is used. Additionally, though Defendant's citation to the specification indicates that "the CPE transceiver retrieves its stored state from the state memory," the specification discloses in the same paragraph that the CO transceiver "exits sleep mode by restoring its state and restoring power," without any mention of a "retrieving" step. ('404 patent at 7:64-8:4). This lack of mention supports the notion that such a "retrieving" step would not have been critical to a POSA's understanding of restoring power. Therefore, I conclude that the additional "retrieving" language in Defendant's proposed construction is unnecessary. I will construe this term to have its plain and ordinary meaning.

13. "recovering said at least one stored parameter from the memory"

14. "recovered parameter"

a. *Plaintiff's proposed construction*:

13.: "retrieving said at least one stored parameter from memory"

14.: "parameter that is retrieved"

b. *Defendants' proposed construction*:

13.: "retrieves the stored parameter from memory"

14.: "parameter that is retrieved from the memory"

c. *Court's construction*:

13.: "retrieving said at least one stored parameter from memory"

14.: "parameter that is retrieved"

Term 13 appears in the asserted claims of the '730 patent and term 14 appears in the asserted claims of the '382 patent. The specification does not use "recover" in discussing "parameters," but the parties generally agree that "recover" should be construed to mean "retrieve" in the context of these terms. (D.I. 441, pp. 137-38).

Defendants agree to Plaintiff's construction for term 13. (*Id.* p. 138).

The parties disagree, however, on whether "recovered parameter" should include the limitation that the parameter is retrieved "from the memory." (*Id.* p. 137). Plaintiff argues that by adding the phase "from the memory" to their proposed construction for "recovered parameter," Defendants improperly read a limitation from the specification into the claim term. (*Id.* p. 138). Further, Plaintiff points out that the claims of the '382 patent do not recite a memory. (*Id.*). Therefore, Plaintiff maintains, Defendants' proposed construction is improper because it contains a limitation, "the memory," that lacks antecedent basis in the claims of the '382 patent. (*Id.*). Additionally, Plaintiff contends that the doctrine of claim differentiation supports its proposed

construction—the presence of a "memory" in term 13 serves as evidence that the patentee "specifically chose not to include 'from the memory' after the phrase 'parameter that is retrieved'" in term 14. (*Id.* p. 139). Plaintiff alleges that Defendants have failed to "point to anything in the intrinsic record that overcomes the presumption" that the omission of "from the memory" from term 14 was intentional. (*Id.*).

Defendants assert, "[A] POSA would understand that the parameter must be retrieved from somewhere and including memory in the construction merely clarifies the simple fact that the parameter is retrieved from memory." (*Id.* p. 138). According to Defendants, the specification provides support, because it "clearly and consistently calls for the parameter to be retrieved from state memory." (*Id.* (citing '382 patent at 7:61-63)). Finally, Defendants contend that their proposed construction is grounded in the claim language, because, "the plain meaning of recovered is that something is taken away and restored. Thus, a 'recovered' parameter must be stored somewhere and then retrieved from that location," which, in the case of the Family 7 patents, is a memory. (*Id.* p. 140). Defendants do not respond to Plaintiff's antecedent basis argument and assert without explanation that the specification and the plain meaning of "recovered" overcome Plaintiff's claim differentiation argument. (*See id.* pp. 138-40).

I agree with Plaintiff. Though Defendants' argument is logical from a factual standpoint, I decline to import a limitation into this term that would lack antecedent basis in the asserted claims of the '382 patent. Additionally, I agree with Plaintiff that the '730 patent provides intrinsic evidence that the patentee knew how to claim a memory when the patentee wished to do so. (*See* '730 patent, claim 18). Though the specification of the Family 7 patents discloses a transceiver having a "state memory," the patentee did not recite a "memory" in any claims of the '382 patent where the disputed term appears. (*See, e.g.*, '382 patent at 5:9-11, 6:64-66, 10:58-11:11). I find

that the specification and claim 18 of the '730 patent provide support for the notion that the patentee's omission of a "memory" in the asserted claims of the '382 patent was intentional. Accordingly, I will construe "recovered parameter" as "parameter that is retrieved."

IV. CONCLUSION

Within five days the parties shall submit a proposed order consistent with this Memorandum Opinion suitable for submission to the jury.