IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

DALI WIRELESS, INC.,	)	
	)	
Plaintiff,	)	
	)	
v.	)	C.A. No. 19-952 (MN)
	)	
COMMSCOPE TECHNOLOGIES LLC and COMMSCOPE HOLDING COMPANY, INC.,	)	
	)	
Defendants.	)	

MEMORANDUM ORDER

At Wilmington this 4th day of January 2021:

As announced at the hearing on December 15, 2020, IT IS HEREBY ORDERED that the disputed claim terms of U.S. Patent Nos. 8,682,338 ("the '338 Patent"), 10,045,314 ("the '314 Patent") and 10,080,178 ("the '178 Patent") are construed as follows:

1. "digital access unit" is not a means-plus-function limitation subject to 35 U.S.C. § 112(f) and the term shall be construed to mean "a unit that manages communications between an operator network and one or more radio remote units" ('338 Patent, claim 1; '314 Patent, claim 1)

2. "reconfiguring each remote radio unit" shall be given its plain and ordinary meaning, which is "changing the configuration of each remote unit" ('338 Patent, claim 1)

3. "downlink signals" / "downlink channel signals" shall be given their plain and ordinary meaning, which is "signals transmitted in the downlink direction" ('338 Patent, claim 1; '314 Patent, claim 1; '178 Patent, claims 1, 10, 15 & 21)

4. "load percentage" shall mean "a value representing the portion of available capacity that is in use" ('338 Patent, claim 1)

5. "routing and switching . . . via the at least one digital access unit" will not be construed at this time and the Court will address this term in connection

with dispositive motions to the extent that the dispute remains ('338 Patent, claim 1)[1]

6. "digital representation" shall be given its plain and ordinary meaning ('314 Patent, claims 7, 8, 10 & 11; '178 Patent, claims 1-5, 8, 10, 11 & 15)

7. "one or more delay compensation merge units configured to delay signals transmitted from or received by each of the plurality of remote units" will not be construed at this time and the Court will address this term in connection with dispositive motions to the extent that the dispute remains[2] ('314 Patent, claim 1)

8. "dynamically change" means that the host unit makes a change in response to conditions as they occur, but this does not include manual changes[3] ('178 Patent, claims 2-5 & 16-17)

9. "[first / second] set of downlink channel signal" limitations shall be given their plain and ordinary meaning ('178 Patent, claims 1, 10, 15 & 21)

10. "detecting" shall be given its plain and ordinary meaning ('338 Patent, claim 3)

The parties briefed the issues (*see* D.I. 104) and submitted an appendix containing intrinsic evidence and extrinsic evidence, including expert declarations (*see* D.I. 105; *see also* D.I. 77, 112). Both sides provided a tutorial describing the relevant technology. (*See* D.I. 108 & 109). The Court carefully reviewed all submissions in connection with the parties' contentions regarding the disputed claim terms, heard oral argument (*see* D.I. 121) and applied the following legal standards in reaching its decision:

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1 To the extent this dispute remains, the parties shall present additional claim construction arguments on this term in their dispositive motion briefing.

2 As with the previous term, the parties shall present additional claim construction arguments on this term in their dispositive motion briefing.

3 Plaintiff agreed to this construction at the hearing.

I. LEGAL STANDARDS

"[T]he ultimate question of the proper construction of the patent [is] a question of law," although subsidiary fact-finding is sometimes necessary. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837-38 (2015). "[T]he words of a claim are generally given their ordinary and customary meaning [which is] the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc) (internal citations and quotation marks omitted). Although "the claims themselves provide substantial guidance as to the meaning of particular claim terms," the context of the surrounding words of the claim also must be considered. *Id.* at 1314. "[T]he ordinary meaning of a claim term is its meaning to the ordinary artisan after reading the entire patent." *Id.* at 1321 (internal quotation marks omitted).

The patent specification "is always highly relevant to the claim construction analysis . . . [as] it is the single best guide to the meaning of a disputed term." *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). It is also possible that "the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips*, 415 F.3d at 1316. "Even when the specification describes only a single embodiment, [however,] the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372 (Fed. Cir. 2014) (internal quotation marks omitted) (quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)).

In addition to the specification, a court "should also consider the patent's prosecution history, if it is in evidence." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980 (Fed. Cir.

1995) (en banc), *aff'd*, 517 U.S. 370 (1996). The prosecution history, which is "intrinsic evidence, . . . consists of the complete record of the proceedings before the PTO [Patent and Trademark Office] and includes the prior art cited during the examination of the patent." *Phillips*, 415 F.3d at 1317. "[T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Id.*

In some cases, courts "will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva*, 135 S. Ct. at 841. Extrinsic evidence "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980. Expert testimony can be useful "to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field." *Phillips*, 415 F.3d at 1318. Nonetheless, courts must not lose sight of the fact that "expert reports and testimony [are] generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence." *Id.* Overall, although extrinsic evidence "may be useful to the court," it is "less reliable" than intrinsic evidence, and its consideration "is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Id.* at 1318-19. Where the intrinsic record unambiguously describes the scope of the patented invention, reliance on any extrinsic evidence is improper. *See Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308 (Fed. Cir. 1999) (citing *Vitronics*, 90 F.3d at 1583).

I. THE COURT'S RULING

The Court's ruling regarding the disputed claim terms of the '338, '314 and '178 Patents was announced from the bench at the conclusion of the hearing as follows:

> . . . At issue we have three patents and ten disputed terms.
>
> I am prepared to rule on eight of the disputes. I will not be issuing a written opinion, but I will issue an order stating my rulings. I want to emphasize before I announce my decisions that although I am not issuing a written opinion, we have followed a full and thorough process before making the decisions I am about to state. I have reviewed the patents in dispute. I have also reviewed the materials in the Joint Appendix, portions of the prosecution history and IPR, expert declarations, dictionary definitions and transcripts from earlier proceedings. There was full briefing on each of the disputed terms. There were also tutorials on the technology submitted by each side. And there has been argument here today. All of that has been carefully considered.
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> Now as to my rulings. As an initial matter, I am not going to read into the record my understanding of claim construction law and indefiniteness – although I don't think there were any indefiniteness issues here today – generally. I have a legal standard section that I have included in earlier opinions, including recently in *Quest Diagnostics Investments LLC v. Laboratory Corporation of America Holdings*, No. 18-1436. I incorporate that law and adopt it into my ruling today and will also set it out in the order that I issue.
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> The parties have proposed similar, though not identical, proposals for the definition of a person of ordinary skill in the art.[4] Neither party has argued that the differences in the proposals are relevant to the issues before me today.
>
> The first term is "digital access unit" or "DAU" in claim 1 of the '338 Patent and claim 1 of the '314 Patent. Plaintiff proposes that the term be construed as "[a] unit that manages communications between an operator network and one or more radio remote units."

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4 Plaintiff's expert, Dr. Bims, opined that "a person of ordinary skill in the art in the field of these patents would have had a bachelor's in computer science, computer engineering, electrical engineering, or their equivalent, and at least three years' experience working with wireless technology." (D.I. 105 at A082). Defendants' expert, Dr. Acampora, opined that a person of skill in the art "would have a Bachelor's Degree in Electrical Engineering or equivalent field of study, with 2-3 years of work experience in the field of wireless communications." (D.I. 105 at A0394).

Defendants propose that the term means "[a] unit that is an interface between a base station and digital remote units" or if that's not right, then it's a means-plus-function term subject to § 112(f).[5]

The two patents have different specifications, but the parties agree that the term "DAU" means the same thing in both patents. There are two areas of dispute – first, whether the DAU manages communications or simply acts as an interface and second, whether the DAU must communicate between a base station and remote unit rather than between an operator network and remote units.

Here, I agree with Plaintiff.

First, the claims do not specify that a base station be present. For example, claim 1 of the '314 Patent recites that the DAU is connected to a "signal source," not a "base station" as proposed by Defendants. The signal source may be a base station, but the claim does not require it to be one. Similarly, the '338 Patent claims do not require the DAU to connect to a base station, and in fact, the patent includes dependent claims that further limit the DAU to connecting to a base station. Claim 6 modifies claim 1 to require "a first digital access unit . . . to communicate with a first base station." Although I don't see that as clear claim differentiation, the patentees clearly knew how to refer to a base station when that is what they meant. They did not do so in claim 1.

Second, I disagree with Defendants that the '338 and '314 Patents define a DAU as an interface. The portions of the specification cited by Defendants are not a definition but are parts of descriptions of embodiments. Moreover, the intrinsic evidence describes the DAU as more than an interface. It has a role in managing communications. The provisional application that led to the '338 Patent directly stated that the role of the DAU is to "coordinate[] the communication between the Remote Radio Head Units[] and the Base Station Controller."[6]

Similarly, the '338 Patent states that "[t]he DAUs track the radio signatures of all the active users within its network and record

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5 If the term is subject to § 112(f), Defendants propose that the function is "providing access to a system for digitally transporting wireless communications" and the corresponding structure is "an upstream connection to a BTS, coupled to a downstream digital communication to remote radio units." (D.I. 104 at 1).

6 (*See* D.I. 105 at A0087).

a running database containing information pertaining to them"[7] and notes that "[t]he DAUs can remotely turn on and off the individual carriers via the gain control parameters."[8] The '314 Patent states that DAUs "support the transport of the RF downlink and RF uplink signals between the Base Station and the DRUs"[9] and "translat[e] the RF signals to baseband for the Downlink and from baseband to RF for the Uplink" and direct "the traffic between the various LAN Ports, PEER Ports and the External Ports."[10]

Having rejected Defendants' position that the digital access unit is a coined term, I also conclude that digital access unit is not a means-plus-function term. The test is whether the "unit" "recited in the claims . . . connotes sufficiently definite structure to a person of ordinary skill."[11] Here there is sufficiently definite structure. Claim 1 of the '314 Patent says that the DAU has at least one with the signal source and one remote interface with the remote units. Defendants agree[d today] that an interface with at least some sources conveys structure.

Additionally, it appears from the specification,[12] for example Figure 1, that the DAU is a box, it is hardware, that must be configured to have particular interfaces. Thus, I find that the DAU in the claims has sufficiently definite structure.

The second term is "reconfiguring each remote radio unit" in claim 1 of the '338 Patent. Plaintiff proposes that it means "readjusting the radio capacity of each remote radio unit by

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7 ('338 Patent at 4:62-64).

8 ('338 Patent at 6:50-51; *see also id.* at 9:29-31 ("As described previously, the uplink signals from the four RRUs are combined within the respective DAU corresponding to each base station."); *id.* at 9:39-43 ("each RRU is already controlled and monitored via the DAUs which comprise the network")).

9 ('314 Patent at 6:22-28).

10 ('314 Patent at 8:1-14; *see also id.* at FIG. 4).

11 *TEK Global, S.R.L. v. Sealant Sys. Int'l, Inc.*, 920 F.3d 777, 785 (Fed. Cir. 2019).

12 *See Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018) ("When evaluating whether a claim limitation invokes § 112, ¶ 6, the essential inquiry remains 'whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.' That determination must be made under the traditional claim construction principles, on an element-by-element basis, and in light of evidence intrinsic and extrinsic to the asserted patents." (citation omitted)).

changing the configuration parameters of the remote radio units." Defendants propose the plain and ordinary meaning, which they assert is "changing the configuration of each remote radio unit."

Here, I agree with Defendants and will construe the term to have its plain and ordinary meaning, which is "changing the configuration of each remote unit."

This construction is supported by the plain language of the claim. "Reconfigure" means to change the configuration.[13] The "reconfiguring" step of claim 1 follows a "configuring" step. The remote radio units are first configured, and then at a later point the configuration is changed (*i.e.*, they are reconfigured). The word "reconfiguring" does not dictate how often the reconfiguration is made. And there is no requirement in the claims that configuration be changed more than once.

I will also not read in Plaintiff's proposed limitation that the reconfiguration must include adjustment of "the radio capacity of each remote radio unit by changing the configuration parameter of the remote radio units." The language of claim 1 specifies that the reconfiguration includes "increasing or decreasing the number of carriers in the respective subset of the plurality of carriers based on the load percentage," but the claim does not specify what change must be made to the configuration.

Plaintiff argues that increasing or decreasing the number of carriers necessarily readjusts the radio capacity of the remote radio unit. Plaintiff, however, offers no support in the intrinsic evidence for that argument. Thus, this term will be construed as "changing the configuration of each remote radio unit."

The third term is "downlink signals" or "downlink channel signals" in claim 1 of the '338 Patent, claim 1 of the '314 Patent, and claims 1, 10, 15 and 21 of the '178 Patent. Here, both parties assert the terms should have their plain and ordinary meaning. They disagree, however, as to what that meaning is. Plaintiff asserts that the plain and ordinary meaning is "signals transmitted in the downlink direction." Defendants assert that the plain meaning is "radio frequency signals transmitted in the downlink direction."

The current dispute is whether the signals transmitted must be radio frequency signals, which are sometimes referred to as RF

13 (D.I. 105 at A0629 (defining reconfigure as "configure (something) differently")).

signals. Plaintiff's original proposal included "radio frequency" signals, but at some point, apparently Plaintiff changed its mind.

Here, I agree with Plaintiff and will construe the term to mean "signals transmitted in the downlink direction" without requiring those signals to be RF signals.

This is supported by the intrinsic evidence. Claim 1 of the '338 Patent specifies that the downlink signals are RF signals. The claims of the '178 Patent do not state that the downlink signals are RF. Nor does claim 1 of the '314 Patent. But claim 20 of the '314 Patent claims the system of claim 1 in which "the plurality of downlink signals comprise RF signals and are received through the at least one signal source interface." All of this suggests that the bare reference to downlink signals is not limited to RF signals and the patentee knew how to distinguish the two.

Additionally, claim 1 of the '338 Patent recites that the downlink signals are translated between baseband and RF. This is similar to the description in the specifications of downlink signals as baseband signals and not RF signals when they travel between the DAU and radio units. For example, at column 5, the '338 Patent explains that on the downlink path "RF signals" are "down-converted, digitized, and converted to baseband (using a Digital Down-Converter)."[14] It is also unclear how the downlink signals in claim 1 that must be translated between RF and baseband can be RF at all times.

The fourth term is "load percentage" in claim 1 of the '338 Patent. Plaintiff has proposed a number of constructions. Today, Plaintiff proposed that "load percentage" means "[t]he amount of active capacity utilized by a remote radio unit relative to the maximum amount of active capacity allocated to the remote radio unit." Defendants propose that I construe only the word "percentage" to mean "[a] part of a whole expressed in hundredths." Defendants propose in the alternative a construction for "load percentage" to mean "a value representing the proportion of available capacity that is in use expressed in hundredths."

I will construe the term to mean "a value representing the portion of available capacity that is in use." Plaintiff today agreed that that construction is appropriate.

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14 ('338 Patent at 5:65-67; *see also* '178 Patent at 4:63-65 (same); '314 Patent at 8:49-51 ("[t]he physical node [of the remote units] translates the signals from RF to baseband for the uplink path and from baseband to RF for the downlink path")).

I will not read in Defendants' proposed insertion of hundredths. Defendants argue that I should include that for mathematical precision, but there are other definitions of percentage including "proportion" that are not of such mathematical specificity. There is nothing in the claim that suggests that such mathematical precision was contemplated or required. Nor is there anything in the specification to support Defendants' proposal.

The fifth term is "routing and switching . . . via the at least one digital access unit" in claim 1 of the '338 Patent. Again, there have been some iterations of this term as the parties proceeded through claim construction briefing. But currently, Plaintiff proposes that the term be construed as "routing and switching . . . [through the agency of/by means of] the at least one digital access unit." Defendants' proposal is that the term be construed as "the at least one digital access unit performs the recited step of routing and switching."

The dispute here is whether the digital access unit must perform all of the routing and switching functions or whether those functions must be done only through the digital access unit.

Here, neither party cites or argues much support in the intrinsic evidence and instead they argue about what "via" means. I cannot decide this issue on the record before me. So I will instruct the parties that if this term remains in dispute, you can use space in the summary judgment briefs to address this term and explain to me how the dispute is relevant to the issues in the case, so I can figure out if this is a claim construction dispute or an infringement issue.

The sixth term is "digital representation" in claims 7, 8, 10 and 11 of the '314 Patent, claims 1 through 5, 8, 10, 11 and 15 through 17 and 21 of the '178 Patent. Plaintiff proposes the construction "digital baseband signals." Defendants propose "digital version."

Here, I agree with Defendants. This term can be understood by its plain and ordinary meaning and no further construction is needed.

The plain meaning of representation is not difficult – it means something that represents. Construing it further does nothing to assist the jury.

To be clear, in construing the term to have its plain and ordinary meaning, I am not reading in Plaintiff's attempts to narrow

the scope of the claim to read in one specific type of digital representation – baseband. Nothing in the claim language requires this narrowed scope.

Plaintiff asserts that, in the '314 and '178 Patents, "digital representations" are expressly described as baseband signals that correspond to, *e.g.*, represent other signals.[15] But the portions of the specifications relied upon are discussions of embodiments, which I will not read into the claims. And even if those are the only embodiments, I note that in column 2, lines 30 to 31 of the '178 Patent, it says that "[t]he data received from the base stations is down-converted, digitized and converted to baseband with the DAU." And the claims do not include the "converted" step. And so I will not include Plaintiff's proposed additional language.

The seventh term is "one or more delay compensation merge units configured to delay signals transmitted from or received by each of the plurality of remote units" in claim 1 of the '314 Patent.

Based on the briefing and argument, I cannot decide this term today. And I think we might benefit from some additional expert opinions on this term as well. So I will again defer ruling on this term until summary judgment.

The eighth term is actually a number of terms in claims of the '178 Patent that include the words "dynamically change."[16] Plaintiff proposes that "dynamically change" means "adaptively change" and "host unit" means "a digital access unit that manages communication between an operator network and one or more remote radio units" and the remainder of the words in the terms have their plain and ordinary meaning. Defendants' current proposal is "[t]his language means the host unit itself is able to make the claimed change in response to conditions as they occur (*i.e.*, automatically change, not manually)."

The dispute appears to be whether the change in operation of the host unit must come from the host unit itself and in response to certain conditions occurring, as Defendants propose, or whether the host unit may be changed by some other apparatus or system, as Plaintiff seems to propose.

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15 In support, Plaintiff cites the '178 Patent at column 2, lines 30-31 ("baseband"), as well as column 4, lines 63-65 and the '314 Patent at column 8, lines 49-51.

16 The terms "the host unit is configurable to dynamically change from" / "the host unit is configurable . . . to dynamically change from" appear in claims 2-5 of the '178 Patent, and the term "the host unit dynamically changes" appears in claims 16-17 of the '178 Patent.

I will construe "dynamically change" to mean that the host unit makes a change in response to conditions as they occur, but this does not include manual changes. Plaintiff agrees to that construction.

Read in the context of the claims, the "dynamically change" limitations refer to the ability of the host unit to implement changes. Each dependent claim recites that the host unit is configurable to "dynamically change" from one operation to another. Claims 3 through 5 and 16 through 17 also recite that that dynamic change is "based on" some specific condition or event. Claims 3 and 16 recite that the dynamic change is "based on a change in network conditions," claim 5 recites that the dynamic change is "based on a change in subscriber needs," and claims 4 and 17 recite that the dynamic change is "based on load balancing." This language suggests that the host unit makes the change in response to conditions occurring.

The specification also explains that the host unit runs an algorithm, and that algorithm can be used to implement changes based on certain conditions – *e.g.*, load balancing and schedule.[17] As to Plaintiff's argument about the NOC configuring the host unit, I do not understand Defendants' proposed construction to exclude this. The host unit may be configured by the NOC to respond to a change in conditions, but the host unit is changing from one operation to another as a change in conditions occur. Therefore, as I just stated, "dynamically change" means that the host unit makes a change in response to conditions as they occur, but this does not include manual changes. I decline to read in the parenthetical including the word "automatically" that Defendants propose. I believe that is unnecessary given my exclusion of manual changes in the construction, which I think is better supported by the specification.[18]

Defendants' only argument to include automatic is that only excluding manual "adds ambiguity." I do not agree. But if it ultimately does, I assume the parties will bring that to my attention in connection with summary judgment.

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17 ('178 Patent at 12:46-54 & 8:56-59).

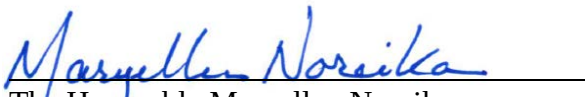
18 (*See, e.g.*, '178 Patent at 11:3-7 (distinguishing dynamic from manual)).

The ninth term is a number of phrases in claims of the '178 Patent.[19] As we discussed, Plaintiff does not dispute the accuracy of the concept underlying Defendants' construction. That is, Plaintiff agrees that the claims do not require the host unit to be able to unpack or extract downlink channel signals/carriers from a composite signal. Plaintiff's issue was simply that construing these terms would unnecessarily import confusion into the terms. Given that both sides agree that the claims do not require the host unit to be able to unpack or extract downlink channel signals/carriers from a composite signal, there is no dispute here that requires construction. And as such, these terms will be given their plain and ordinary meaning.

Finally, we have "detecting" in claim 3 of the '338 Patent. Plaintiff proposes the term should have its plain and ordinary meaning. Defendants' current proposal is "sensing the carrier signals to determine which carriers are active for each remote radio unit." Plaintiff does not disagree that this is a form of detecting but does not agree that it is the only form.

Here, I agree with Plaintiff and will give the term its plain and ordinary meaning. The '338 Patent does not explicitly define "detecting." Defendants argue that the plain meaning of "detect" is to sense a signal or other phenomenon. Defendants apply that meaning in the context of the '338 Patent, asserting that "detecting" here must mean sensing the carrier signals. In Defendants' view, Plaintiff has failed to offer any other examples of how the claimed detection of signal activity can be effectuated.

I am, however, unpersuaded that Defendants' proposed construction is necessary or helpful, and the term will be given its plain and ordinary meaning.



The Honorable Maryellen Noreika
United States District Judge

19 The terms are "the host unit is configurable to send digital representations of a [first / second] set of downlink channel signals," "transmitting from a host unit . . . digital representations of a [first / second] set of downlink channel signals" and "the host unit is configured to transmit a digital representation of a [first / second] portion." These terms appear in claims 1, 10, 15 and 21 of the '178 Patent.