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**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA**

ENTROPIC COMMUNICATIONS,
LLC,

Plaintiff,

v.

DISH NETWORK CORPORATION, *et al.*,

Defendants.

Case No. 2:23-cv-1043-JWH-KES
(Lead Case)

Case No. 2:23-cv-1047-JWH-KES
(Related Case)

Case No. 2:23-cv-1048-JWH-KES
(Related Case)

Case No. 2:23-cv-5253-JWH-KES
(Related Case)

**ENTROPIC COMMUNICATIONS,
LLC'S OPENING CLAIM
CONSTRUCTION BRIEF;
DECLARATION OF MICHAEL T.
PIEJA IN SUPPORT THEREOF**

ENTROPIC COMMUNICATIONS,
LLC,

Plaintiff,

v.

COX COMMUNICATIONS, INC., *et al.*,

Defendants.

1 ENTROPIC COMMUNICATIONS,
2 LLC,

3 Plaintiff,

4 v.

5 COMCAST, *et al.*,

6 Defendants.

7 ENTROPIC COMMUNICATIONS,
8 LLC,

9 Plaintiff,

10 v.

11 DIRECTV, LLC, *et al.*,

12 Defendants.

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1 **I. INTRODUCTION**

2 In this patent case, the parties dispute the meaning of thirteen terms across nine
3 patents.¹ The asserted patents address the general problem of establishing a reliable
4 and efficient network among devices within a home or building, and enabling that
5 network over existing coaxial cabling structures. Existing coaxial cabling was
6 installed for a different purpose: to link a cable service provider’s “head-end” or
7 another source of programming outside the home to one or more network devices
8 inside. These structures typically used “splitters” inside the premises to deliver copies
9 of external signals to each intended destination. The arrangement worked well for its
10 purpose, but the existing cabling and splitters impeded communications *among*
11 devices within the premises.

12 The claimed inventions span multiple aspects of a novel local network to solve
13 these impediments. Among other improvements, these inventions (1) overcome the
14 problem of communicating through coaxial splitters; (2) enable simultaneous
15 communication to multiple nodes; (3) establish a process for admitting new devices
16 to the local network; (4) optimize the construction of data packets based on measured
17 delays between devices; and (5) coordinate the transmission of data across the
18 network to meet bandwidth constraints and quality of service requirements.

19 Throughout the asserted patents, the applicants provided clear guidance and
20 context to persons of skill regarding the metes and bounds of their claims. Entropic’s
21 proposals stay true to the claim language and most naturally align with the patents’
22 descriptions of the invention. Defendants’ proposals, by contrast, repeatedly take
23 terms out of context and depart from the intrinsic evidence. Entropic’s proposals are
24 the correct ones and should be adopted.

25
26 ¹ These nine patents are U.S. Patent No. 7,594,249; U.S. Patent No. 7,295,518; U.S.
27 Patent No. 7,889,759; U.S. Patent No. 8,631,450; U.S. Patent No. 8,085,802; U.S.
28 Patent No. 8,621,539; U.S. Patent No. 9,838,213; U.S. Patent No. 10,432,422; U.S.
Patent No. 8,363,681 and have been attached to the Declaration of Michael T. Pieja
as Exhibits 1 through 9, respectively.

II. AGREED TERMS

In addition to the agreed terms in the Joint Claim Construction Statement, the parties have since agreed to the following constructions:

Term	Construction
“MAC layer” (’539 Pat., cls. 1, 4, 7)	Plain and ordinary meaning
“response signal” (’759 Pat., cls. 1, 2, 3; ’450 Pat., cl. 29)	Signal transmitted in response to the probe signal
“channel number field” (’802 Pat., cls. 3, 4)	Plain and ordinary meaning
“next beacon index field” (’802 Pat., cl. 3, 4)	Plain and ordinary meaning

III. CONSTRUCTIONS OF DISPUTED CLAIM TERMS

A. Terms Common Across Multiple Patent Families

As described above, the asserted patents generally relate to systems and methods used in a local coaxial networking environment, such as a network in a home or building. As a result, several of the claims recite a “broadband cable network,” “Broadband Coaxial Network,” or “coaxial network” as an element of the invention.

1. “broadband cable network” / “Broadband Coaxial Network (BCN)” / “coaxial network” (’759 Pat., cls. 1–3; ’802 Pat., cls. 3–4; ’450 Pat., cls. 29–33; ’539 Pat., cl. 1)

Entropic’s Construction	Defendants’ Construction
Plain meaning, wherein the network is a local network	Plain and ordinary meaning

1 The parties agree that the various “network” terms in the ’759, ’802, ’450, and
2 ’539 Patents can be addressed together. Entropic’s construction properly reflects the
3 patents’ distinction of the claimed **local** network (among devices in a premises) from
4 networks outside the local premises, such as the cable provider’s network.
5 Defendants’ construction, on the other hand, vitiates this distinction and disregards
6 language expressly limiting the scope of the inventions to local networks.

7 a) **The “present invention” as a whole is a local network**

8 “When a patent . . . describes the features of the ‘present invention’ as a
9 whole, this description limits the scope of the invention.” *Verizon Servs. Corp. v.*
10 *Vonage Holdings Corp.*, 503 F.3d 1295, 1308 (Fed. Cir. 2007). Here, the patents
11 describe the “present invention” and the need it solves in a way that makes clear that
12 the claimed “broadband cable network” is a local one.

13 To begin, both the ’802 and ’450 Patents describe the “present invention” as a
14 whole as directed to networking within a home or premises, i.e., local networking:

15 ***The present invention*** is focused on utilizing the ***home coaxial cable***
16 as a medium for high speed ***home networking*** by utilizing frequencies
17 above the ones currently used by the Cable Operators for their cable
18 service. . . . The ***present invention*** describes a system that ***allows node***
19 ***devices (“CPEs”) to communicate directly*** over the existing coaxial
20 cable with its current architecture without the need to modify ***the home***
21 ***cable infrastructure***.

22 (’450 Pat. at 3:11–40; ’802 Pat. at 3:5–33 (emphases added).) Importantly, these
23 repeated references are found in the “Background of the Invention” and are not
24 directed or limited to a specific embodiment. *See Mosaic Brands, Inc. v. Ridge Wallet*
25 *LLC*, 55 F.4th 1354, 1361–62 (Fed. Cir. 2022).

26 Similarly, all four of the ’802, ’450, ’759, and ’539 Patents describe the need
27 or purpose for the invention solely in terms of a “local” network:

28 Therefore, ***there is a need*** for a system and method to connect a variety

1 of CPEs [customer premise equipment] into a *local data network*, such
2 as a *local area network* (“LAN”), *within a building such as a home or*
3 *office*, while utilizing an existing coaxial cable network within the
4 building. Additionally, there is a need for the system and method to
5 have the capability of allowing the user to incorporate a variety of
6 newly developed CPEs into *the local data network* quickly and easily.
7 (’450 Pat. at 4:1–8 (emphases added); ’539 Pat. at 4:26–33; *see* ’802 Pat. at 3:64–4:3
8 (same); ’759 Pat. at 3:63–4:3 (same).) This paragraph concludes the “Background of
9 the Invention” section and summarizes the claimed invention and the need it solves.
10 *GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1371 (Fed. Cir. 2016) (limiting the
11 meaning of “node” by how the “summation” sentence describes present invention).

12 The specifications then uniformly describe the invention in a way that confirms
13 that the claimed “broadband cable network” is a local network. For instance, the ’802
14 and ’450 Patents explain that “[t]he coaxial cable *within the dwelling* forms the BCN
15 network.” (’802 Pat. at 15:21–22 (emphasis added);² ’450 Pat. at 13:56–57.) These
16 patents also explain that their “invention[s] relate[] . . . to access protocols used in a
17 local area broadband communication networks.” (’802 Pat. at 1:16–18; *see* ’450 Pat.
18 at 1:22–24 (same).) Both the ’450 and ’539 Patents include “local area network” in
19 their titles. (’450 Pat., Title (“Broadband Local Area Network”); ’539 Pat., Title
20 (“Physical Layer Transmitter for Use in a Broadband Local Area Network”).) And
21 all four patents consistently describe a “broadband cable network . . . within a
22 building (also known as customer premises or ‘CP’) such as a typical home or office.”
23 (’759 Pat. at 2:11–14; ’450 Pat. at 1:65–2:1; ’802 Pat. at 1:59–62; ’539 Pat. at 2:4–
24 7.) Likewise, the drawings for each patent depict a “Broadband Cable Network”
25 within a “Building.” (’759 Pat., Fig. 1; ’450 Pat., Fig. 1; ’802 Pat., Fig. 1; ’539 Pat.,
26 Fig. 1.) Thus, when the patents refer to “networks,” they mean local networks that

27
28 ² Numbers referring to patent drawings are omitted from specification quotations here
and throughout this brief.

are “utilized within . . . buildings.” (’759 Pat. at 3:22–24; ’539 Pat. at 3:39–40; *see also, e.g.*, ’450 Pat. at 14:14–16; ’802 Pat. at 15:22–24.)

The applicants reinforced this meaning during prosecution. During prosecution of the ’539 Patent, the applicants explained that “[t]he claims of the present application relate to a method for improving the ability of a network of nodes *within a home entertainment network* (or other such entertainment network) to communicate with one another over existing coaxial cables that are preinstalled in *many homes and buildings today.*” (Ex. 10, ’539 Pat. File History, 4/9/13 Appeal Br. at 6 (emphases added).) The language describing “the claims of the present application” echoes the language describing the “present invention” and confirms that the “broadband cable network” or “coaxial network” must be a local network.

b) The patents distinguish external from local networks

Not only do the patents uniformly describe the “present invention” as directed to a local “broadband cable network” or “coaxial network,” each of the four patents distinguishes the claimed “broadband cable network” from non-local, wide-area networks. Figure 3 of the ’450 and ’802 Patents illustrates this distinction:

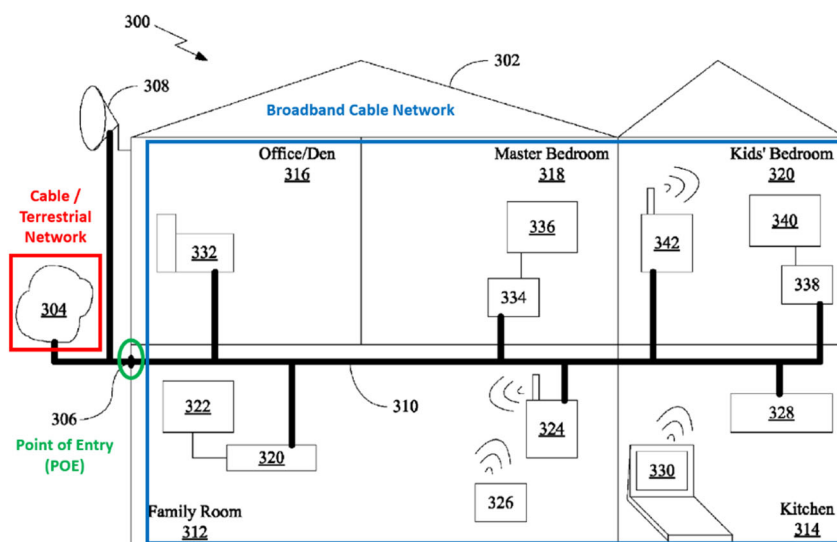


Figure 3 (annotated), ’802 and ’450 Patents

As annotated above and described in each patent, the “point-of-entry (POE)” (shown in green) delineates the claimed “broadband cable network” (shown in blue) from

1 “externally received” cable signals (shown in red) or satellite signals. (See ’759 Pat.
2 at 1:47–55; ’450 Pat. at 1:28–37; ’802 Pat. at 1:22–31; ’539 Pat. at 1:27–36; *see also*,
3 *e.g.*, ’759 Pat. at 8:30–32 (“[t]he POE may be the connection point from the cable
4 provider which is located external to the customer premises of the BCN”); ’802 Pat.
5 at 6:18–20 (diagraming “a BCN network within a home or building” and explaining
6 that “[a] cable/terrestrial network connection is made at a POE in home”).) Thus, the
7 patents plainly describe two different networks connected via a POE: the “**BCN**
8 **network** within the home [that] connects with the **satellite dish and cable/terrestrial**
9 **network** at POE.” (’450 Pat. at 5:51–52 (emphases added); ’802 Pat. at 6:25–26.)
10 When the claims use “broadband cable network,” they refer only to the former.

11 Further, the prosecution history of the ’802 Patent confirms this distinction
12 when it contrasts “nodes **outside** the broadband cable network” from “nodes **within**
13 the broadband cable network.” (Ex. 11, ’802 Pat. File History, 5/5/09 Resp. to Office
14 Action at 9 (emphases added).) The applicants characterized this outside versus local
15 distinction as “a substantial difference in the architecture and purpose of what is
16 disclosed by [the art] and the invention recited in [the] claims.” (*Id.* at 9–10.)
17 Defendants’ unqualified plain-meaning proposal thus improperly erases a defining
18 distinction that appears repeatedly throughout the intrinsic evidence.

19 **2. “node” (’759 Pat., cls. 1–3; ’802 Pat., cls. 3–4; ’539 Pat., cl. 1)**

20

Entropic’s Construction	Defendants’ Construction
Terminal downstream of the point of entry	Plain and ordinary meaning

23

24 For this term, Defendants propose an unqualified plain meaning that gives no
25 guidance, while Entropic proposes using the meaning of “node” that the patents
26 provide—that is, a “terminal downstream of the point of entry.”

27 To start, the claims do not refer to “nodes” generally, but instead to “nodes in
28 a broadband cable network.” (’759 Pat., cls. 1–3; ’802 Pat., cls. 3–4.) Thus, since

1 “broadband cable network” means a local network, (*see supra* § III.A.1), the nodes
2 referred to are those within a building or customer premise. Relative to the flow of
3 externally received signals, these nodes are downstream of the point of entry (as
4 shown in the annotated Figure 3 in the previous section). (*Id.*)

5 The patent specifications confirm that node refers to a terminal downstream of
6 a network’s point of entry (POE). Each one explains that broadband cable networks
7 “distribute downstream signals *from the POE to various terminals (also known as*
8 *‘nodes’*) in the building.” (’759 Pat. at 1:51–58 (emphasis added) and 3:25–30; ’802
9 Pat. at 1:27–34 and 3:17–23; ’539 Pat. at 1:31–39 and 3:51–54.) Similarly, multiple
10 figures confirm this, using arrows to indicate signal flow within a BCN from a POE
11 to nodes, all of which are located downstream of the POE. (*See* ’759 Pat., Figs. 3, 6–
12 8; ’802 Pat., Figs. 7, 10–11; ’539 Pat., Fig. 2.)

13 Entropic’s proposal thus matches how the claims and specification define
14 “node”: a terminal downstream of the POE in a broadband cable network. Because
15 “[t]he construction that stays true to the claim language and most naturally aligns
16 with the patents description of the invention will be, in the end, the correct
17 construction[.]” *Profectus Technology LLC v. Huawei Technologies Co.*, 823 F.3d
18 1375, 1380–81 (Fed. Cir. 2016) (quotation omitted), Entropic’s proposal should be
19 adopted.

20 B. ’249 Patent

21 The ’249 Patent recites a network wherein devices transmit signals over
22 coaxial cabling, and a filter then reflects the signals back into the network for other
23 devices to receive them. It combines that filter with the use of a technique called
24 “equalization” to overcome certain impairments that these reflections can cause.

- 25 1. “equalization on the received signal that restores a flat
26 frequency response to overcome communication channel
27 impairments caused by the reflected signals” (’249 Pat., cl. 10)
28

Entropic’s Construction	Defendants’ Construction
Plain meaning, not indefinite	Equalization on the received signal that eliminates from the received signal all intersymbol interference (ISI) caused by the reflected signals

For this term, Defendants propose to rewrite “*overcom[ing]* communication channel impairments caused by the reflected signals,” (’249 Pat. at 10:30–33 (emphasis added)), to require “*eliminat[ing]* . . . *all*” of an impairment known as “intersymbol interference (ISI).” But neither the claims, the specification, or the extrinsic evidence suggests redrafting the claims in such absolute terms. Indeed, Defendants’ only support for its proposed redraft is the say-so of its expert—a position that is contradicted by the very documents that expert cites.

As the parties’ experts agree, “equalization” is a technique “used to account or compensate for distortions in a signal” that has been transmitted over a communications network. (Ex. 12, 6/28/24 Declaration of John Holobinko (“Holobinko Decl.”) ¶ 38; *see* Ex. 13, 6/28/24 Declaration of Dr. Krista S. Jacobsen (“Jacobsen Decl.”) ¶ 204 (“an equalizer . . . is a filter that adjusts and ‘cleans up’ the received signal to reduce distortion and noise.”).) One type of distortion that an equalizer can address is “inter-symbol interference” or “ISI.” (’249 Pat. at 5:64–6:13; Jacobsen Decl. ¶ 207.) ISI occurs when a transmitted signal reflects off different elements in the network; the reflections arrive at a receiver at different times, and thus interfere with each other. (’249 Pat. at 5:64–6:13; Jacobsen Decl. ¶ 203.) And as described by Entropic’s expert, Mr. John Holobinko, a “frequency response” of a channel indicates how the received power of a signal varies between the different frequencies that make up the signal. (Ex. 14, 7/12/24 Second Declaration of John Holobinko (“Holobinko Rebuttal Decl.”) ¶ 2.) The more constant the received power is between different frequencies, the flatter the frequency response.

///

1 Entropic’s plain meaning construction is the correct one. The parties agree that
2 the claimed equalizer addresses “distortion” and “noise” in a signal. (Holobinko Decl.
3 ¶ 38; Jacobsen Decl. ¶ 204.) And as Entropic’s expert explained, the plain meaning
4 of using an equalizer to “overcome communication channel impairments caused by
5 the reflected signals” is simply “to allow the transmitted symbols to be reliably
6 decoded at the receiver in the face of the” impairments. (Holobinko Rebuttal Decl.
7 ¶ 7.) An engineer would thus understand that “overcoming” ISI simply meant
8 reducing it to allow transmissions to be reliably decoded. (*Id.*)

9 Defendants’ proposal, in contrast, improperly redrafts the claim in two ways.
10 First, it strikes “restores a flat frequency response” from the claim. Second, it rewrites
11 “overcome . . . impairments” to require “eliminate[ing]” them entirely. In other
12 words, Defendants require absolute, theoretical perfection in the system’s ability to
13 remove interference—something a person of skill would never impose on a real-
14 world system. *See Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*,
15 904 F.3d 965, 972 (Fed. Cir. 2018) (rejecting argument that “fixed frequency”
16 requires “an absolutely fixed frequency with no variance”). Unsurprisingly, this
17 redraft finds no support in the term’s plain meaning, the intrinsic evidence, or the
18 documents cited by either expert.

19 First, the plain meaning of “overcome” is not “eliminate.” A skydiver who has
20 overcome a fear of heights has not eliminated that fear but persisted in spite of it.

21 Second, the intrinsic record never references “eliminating” interference.
22 Rather, in explaining how the claimed equalizer works, the specification describes
23 that it can “overcome,” rather than eliminate, interference:

24 The effects of ISI can be **overcome** by applying modulation techniques
25 or receiver processing techniques. An adaptive equalizer in the terminal
26 device receiver creates a filter response that restores a flat frequency
27 response impaired by the multipath signal.

28 (’249 Pat. at 6:7–11 (emphasis added).) Nothing in the specification discusses a

1 requirement that ISI be “eliminated” entirely. Instead, it describes embodiments that
2 use “decision feedback (DFE)” and means-squared error equalizers. (*Id.* at 8:50–54.)
3 These types of equalizers, however, do not eliminate *all* ISI. (Ex. 13, Exhibit AB to
4 Jacobsen Decl. (Dr. John Cioffi’s Course Reader) at 180 (“The Minimum Mean-
5 Square Error Linear Equalizer . . . balances a reduction in ISI with noise
6 enhancement.”); *id.* at 213 (“Because the FIR equalizer may not be sufficiently long
7 to cancel all ISI, the FIR ZF-DFE may still have nonzero residual ISI.”).) Thus,
8 Defendants’ construction improperly excludes embodiments in the specification.

9 Third, Defendants’ expert, Dr. Jacobsen, admits that equalizers were generally
10 recognized to mitigate or reduce ISI, but not eliminate it. For instance, she relies on
11 a textbook called “Cable Modems: Current Technologies and Applications.”
12 (Jacobsen Decl. ¶ 213.) This book explains that equalization can “*mitigate*
13 intersymbol interference” but—as Dr. Jacobsen admitted—does not describe
14 eliminating it. (*Id.* (emphasis added); Ex. 15, Jacobsen 11/19/24 Dep. (“Jacobsen
15 Tr.”) 63:10–64:3.) Similarly, Dr. Jacobsen relies on a “Course Reader” by Stanford
16 professor Dr. John Cioffi—who has won “awards” for his work and is “at least as
17 knowledgeable” as she is on the topic. (Jacobsen Decl. ¶¶ 216–17; Jacobsen Tr. 67:2–
18 16.) Dr. Cioffi, consistent with the “Cable Modems” textbook, confirms that
19 “[e]qualization methods are used by communication engineers to *mitigate* the effects
20 of the intersymbol interference.” (Jacobsen Decl. ¶ 217 (emphasis altered); Jacobsen
21 Tr. 69:2–17.) Indeed, Dr. Jacobsen conceded that the equalization methods disclosed
22 in Dr. Cioffi’s work “try to eliminate ISI, but don’t necessarily do so.” (Jacobsen Tr.
23 70:11–22.) Some of Dr. Jacobsen’s other cited literature also refer to “correcting” ISI
24 to remove “extensive amounts” of ISI, not *all* of it. (Ex. 13, Exhibit AC to Jacobsen
25 Decl. at 192 (Graham Wade, Signal coding and processing (Cambridge Univ. Press
26 2d ed. 1994)); Jacobsen Tr. 82:10–83:10.) Thus, even the materials Defendants’
27 expert relied on confirm that to “overcome” ISI does not require “eliminating” it.

28 ///

1 Further, as Entropic’s expert, Mr. Holobinko, explained, given the constraints
2 faced in real-world network design, a person of skill would not understand a directive
3 to “overcome” ISI to require its complete elimination. (Holobinko Rebuttal Decl. ¶
4 7.) For instance, the functionality of networks and the equalizers used within them
5 are limited by cost, power capacity, and available computing power. (*Id.*) Further,
6 many equalizers are not capable of “eliminating” ISI, either because doing so would
7 distort the signal in other ways, or because they rely on mathematical approximations
8 that cannot perfectly “eliminate” ISI. (*Id.* ¶¶ 9, 10.)

9 Set against this wealth of evidence, and even though extrinsic expert testimony
10 cannot override unambiguous intrinsic evidence, *ParkerVision, Inc. v. Qualcomm*
11 *Inc.*, 116 F.4th 1345, 1357 (Fed. Cir. 2024), Defendants rely only on the say-so of
12 their expert. Dr. Jacobsen states that it “would have been appreciated . . . [that]
13 restoring a flat frequency response means not just reducing ISI, but eliminating [it]
14 altogether.” (Jacobsen Decl. ¶ 221.) But Dr. Jacobsen cites no authority after that
15 assertion. She also contends that a flat frequency response means a so-called
16 “memoryless channel” that lacks ISI entirely. (*Id.*) But the documents she cites to
17 support this position explain that equalizers do not necessarily make a channel
18 memoryless when addressing ISI—they merely “*try* to convert a . . . channel with ISI
19 into one that *appears* memoryless.” (*Id.* (emphases added) (citation omitted).)

20 Dr. Jacobsen’s citation to a single reference to “correcting” ISI in the file
21 history is equally unavailing. In the May 25, 2007 filing that she references, the
22 applicant was distinguishing the application from two references that did not teach
23 equalization *at all*. (Ex. 16, ’249 Pat. File History, 5/25/07 Resp. to Office Action at
24 9 (“Equalization is not taught by Li or Langlais . . .”).)

25 Because Defendants’ proposal improperly rewrites claim 10, the Court should
26 reject it and give the “equalization” term its plain meaning, as Entropic proposes.

27 C. ’518 Patent

28 Like the ’249 Patent, the ’518 Patent recites hardware and architectures that

1 enable communication between devices (i.e., nodes) within a coaxial network.
2 The devices claimed in the '518 Patent use probe signals to determine characteristics
3 of the channels between one another. Then, based on the probe results, these devices
4 perform a function called “bit loading” that uses the determined characteristics to
5 modulate data for transmission in an efficient and reliable way.

6 **1. “bit loading is selected based on the determined channel**
7 **characteristics” ('518 Pat., cl. 1)**

8

Entropic’s Construction	Defendants’ Construction
Plain meaning, not indefinite	Indefinite

11

12 Claim 1 of the '518 Patent recites a network (a “data communication
13 network”), the components of that network (such as coaxial “cable wiring” and
14 “network devices”), and the functionalities of those components (such as transmitting
15 and analyzing probe signals and selecting bit loading). A person of skill would
16 understand the claim recites network device functionalities, not—as Defendants
17 argue—method steps. Thus, claim 1 is not indefinite as a mixed method and apparatus
18 claim.

19 A patentee may use functional language to define the capabilities of a recited
20 apparatus or system, and such functional language does not reflect a method step.
21 *See UltimatePointer, L.L.C. v. Nintendo Co.*, 816 F.3d 816, 827 (Fed. Cir. 2016)
22 (“[T]he claims at issue here make clear that the ‘generating data’ limitation reflects
23 the capability of that structure rather than the activities of the user.”). Indeed, in only
24 “a fairly narrow range of circumstances” is a claim held indefinite for claiming both
25 an apparatus and a method. *Polaris PowerLED Tech., LLC v. VIZIO, Inc.*, No. SACV
26 18-1571 JVS (DFMx), 2019 WL 13043592, at *14 (C.D. Cal. Nov. 26, 2019).
27 Typically, this issue arises for claims that “specifically prescribed *user* action.”
28 *Condair Grp. AG v. Dri-Steem Corp.*, No. 21-CV-0863 (PJS/ECW), 2023 WL

1 3480240, at *3 (D. Minn. May 16, 2023).

2 Here, claim 1 of the '518 Patent recites a “data communication network” (i.e.,
3 a system) and the capability that network and its components must have. The claim
4 recites hardware, namely “network devices” with specific hardware components
5 (such as a multi-carrier demodulator) and “cable wiring” with splitters and tap ports.
6 ('518 Pat., cl. 1.) The claim then contains “wherein” clauses that recite capabilities
7 of these devices, including “bit loading” performed based on probe signals
8 transmitted and analyzed by the network devices. (*Id.*; Jacobsen Tr. 35:1–8.)
9 As experts for both parties agree, “bit loading” in this context refers to the assignment
10 of different numbers of bits to different carriers according to the quality of a channel
11 between devices. (Ex. 17, 6/28/24 Declaration of Dr. Bertrand Hochwald
12 (“Hochwald Decl.”) ¶ 45; Holobinko Decl. ¶ 44.)

13 Importantly, the claim does not recite any user action. As a person of skill
14 would understand, this is because the functions recited—transmitting probes to
15 analyze channel characteristics and selecting bit loading based on those
16 characteristics—are performed automatically by hardware within network devices
17 and without user intervention or control. (Holobinko Decl. ¶ 84; *see also* Jacobsen
18 Tr. 27:14–25 (person of skill would “look at the functionality of the transmitter and
19 receiver” to determine if bit loading was used).)

20 The specification confirms that the selection of bit loading is a capability of
21 the network devices, not a method step performed by a user. Figures 5 and 6 describe
22 specific components of devices on the network, such as a quadrature amplitude
23 modulation (“QAM”) encoder, that are used to perform bit loading. ('518 Pat. at
24 8:51–9:27, Figs. 5 and 6). The specification likewise confirms that network devices
25 transmit probes to one another and analyze the probes received. (*Id.* at 9:35–49.)
26 And the specification explains that either the transmitting device or the receiving
27 device may select bit loading. (*Id.* at 9:50–58.) From these disclosures, the person of
28 skill would understand that “bit loading is selected” refers to a capability that a

1 network device has. The passive voice (“is selected”) is used not to suggest that the
2 claim requires an outside action, but because the bit loading functionality may be
3 performed by one of many devices. (Holobinko Decl. ¶ 80.)

4 By contrast, no evidence supports Defendants’ indefiniteness argument.
5 Defendants’ expert, Dr. Jacobsen, opined that the disputed phrase “bit loading is
6 selected” recites a method step that a user may perform. (Jacobsen Decl. ¶ 48.)
7 But her opinion is entirely conclusory: she cites no intrinsic evidence and provides
8 no technical evidence or analysis. (*Id.*; Jacobsen Tr. 33:24–34:25.) Nor did she
9 identify any evidence in the patent or file history that a user could perform the
10 function of bit loading. (Jacobsen Tr. 36:13–37:10.) This is to be expected, as no such
11 disclosure exists.

12 Lastly, contrary to Defendants’ arguments, it is clear which network elements
13 perform bit loading. The claimed “network devices” are the only hardware recited in
14 the claim that can perform that function: neither of the other elements—cable wiring
15 nor splitters—can do so. (Holobinko Decl. ¶ 81.) The network devices also perform
16 both predicate functions on which bit loading is based: transmission and analysis of
17 probes. (Jacobsen Tr. 35:1–8.) In her declaration, Dr. Jacobsen suggests that there
18 may be other devices, such as “LAN modems” or “terminal devices,” that could
19 perform bit loading. (Jacobsen Decl. ¶ 50.) But this is a false distinction: the devices
20 Dr. Jacobsen identifies are all *examples* of network devices. (*See* Jacobsen Tr. 39:11–
21 17, 40:11–22, 41:24–42:12.) Further, the ’518 Patent does not describe using one set
22 of devices to transmit and analyze probes and a completely different set to perform
23 bit loading. (*See id.* at 37:24–38:4.) Thus, the person of skill would be reasonably
24 certain that “wherein network devices . . . bit loading is selected” recites a
25 functionality of the claimed network devices, not a method step.

26 **D. ’759 and ’450 Patents**

27 The ’759 and ’450 Patents also recite the use of probing and bit loading, but in
28 the context of transmissions to multiple nodes. They recite methods for determining

a “common bit-loading modulation scheme” that allows one node to broadcast data to multiple nodes so that each node can receive the transmission.

1. “a common bit-loading modulation scheme” (’759 Pat., cls. 1–3; ’450 Pat., cl. 29)

Entropic’s Construction	Defendants’ Construction
A bit-loading modulation scheme used for simultaneous transmission to multiple nodes so that each can receive the transmission	The lowest modulation values supported by the [corresponding] channel paths ³

There should be no disagreement about the construction of a “common bit-loading modulation scheme” because the parties agree that (1) it is a bit-loading modulation scheme (a known concept in the art), and that (2) it is used to optimize throughput when sending data to multiple nodes at once. But Defendants’ proposed wording—wittingly or not—achieves the exact opposite. By requiring use of the “*lowest* modulation values,” Defendants’ construction requires an inefficient scheme that frustrates the very purpose of the claimed invention. Only Entropic’s proposed construction captures the scheme’s purpose and should be adopted.

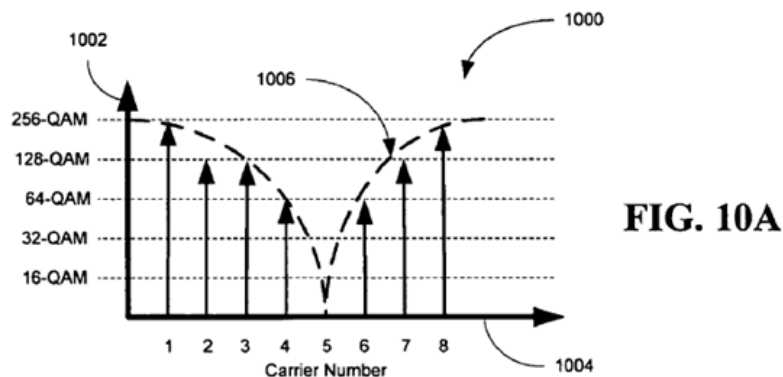
To begin, “[b]it-loading is the process of optimizing the bit distribution . . . to increase throughput” based on conditions of a channel. (’759 Pat. at 7:12–14; Holobinko Decl. ¶ 44.) Defendants’ expert, Dr. Hochwald, described bit loading similarly: “assigning bits to []carriers according to the quality of the channel.” (Hochwald Decl. ¶ 45.) Thus, the parties agree about what a bit-loading modulation scheme is and that it has a well-understood meaning to persons of skill. The only

³ Defendants’ proposed construction for the ’450 Patent includes the word “corresponding” while their construction for the ’759 Patent does not. According to Defendants, “[t]his difference . . . is not intended to be substantive” and is only meant “to track a minor difference in other elements of the asserted claims of these two patents.” (Hochwald Decl. ¶ 60.)

portion of the term that requires construction is the modifier “common.”

Here, the ’759 and ’450 Patents claim the use of a “common” bit-loading scheme that enables one node to transmit data to multiple nodes simultaneously, rather than having to send data successively to one node at a time. For instance, the ’759 Patent explains that node A may “*transmit a message* in broadcast mode (also known as a ‘multicast’ mode) *simultaneously* to node B and node C” (’759 Pat. at 6:55–58 (emphases added).) However, because the conditions on channel AB can differ from those of channel AC’s, “*in order to [e]nsure that both node B and node C receive the transmissions broadcast signal from node A*, node A utilizes a bit-loading modulation scheme that is known as a common bit-loading modulation scheme.” (*Id.* at 6:63–67 (emphasis added).)

The parties’ experts agree that Figures 10A to 10C of the ’759 Patent explain exactly how this common bit-loading modulation scheme is determined (as do Figures 13A to 13C of the ’450 Patent). (Holobinko Decl. ¶ 45; Hochwald Decl. ¶ 50.) These figures show an example where one node, Node A, is sending data simultaneously to Nodes B and C. Figure 10A represents the bit loading scheme for each carrier when data is sent from Node A to Node B along channel “AB,” and Figure 10B represents the bit loading scheme for each carrier when data is sent from Node A to Node C along channel “AC.” Figure 10C then shows the “common” scheme to use for sending data from Node A to Nodes B and C.



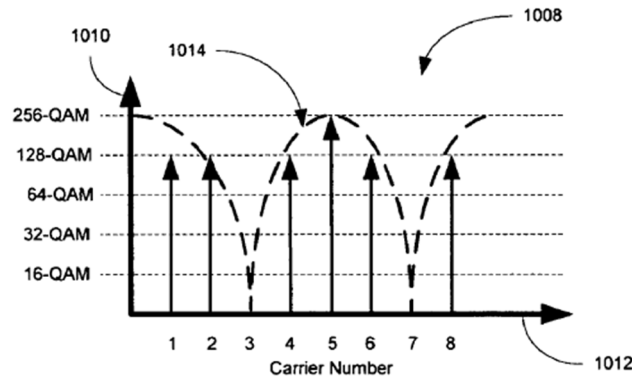


FIG. 10B

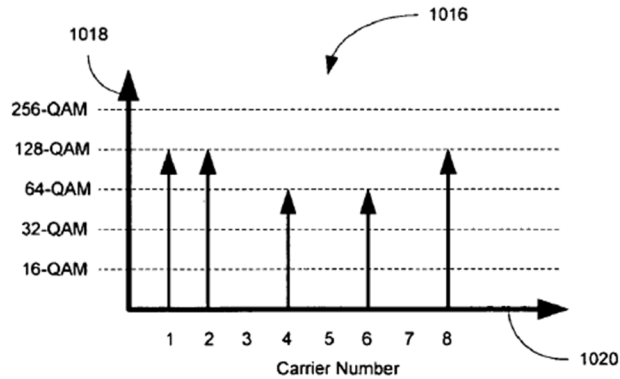


FIG. 10C

As indicated in the figures above, the highest modulation value supported by carrier number 1 of channel AB is 256 QAM (i.e., 256 bits per symbol), and the highest value supported by carrier number 2 is 128 QAM (128 bits per symbol). (See '759 Pat. at 10:15–28, Fig. 10A.) By contrast, for channel AC, both carrier number 1 and carrier number 2 only support 128 QAM; a signal transmitted with a higher value cannot be received. (See *id.* at 10:29–40, Fig. 10B.) To ensure that both nodes can receive the same transmission, the common scheme (represented by Figure 10C) uses 128 QAM for both carrier numbers 1 and 2 because that is the highest modulation value that allows a transmission to be received across both channels AB and AC. (*Id.* at 10:41–48, Fig. 10C.)

Entropic's proposal accurately reflects this scheme. The phrase "so that each can receive the transmission" means that the value selected is supported by all nodes. The result is a "common bit-loading modulation scheme" used for transmissions to multiple nodes simultaneously, as described in Figures 10A to 10C.

///

1 Defendants' construction, by contrast, describes the *opposite* of the claimed
2 invention. As Defendants' expert explains, the common bit-loading scheme involves
3 devices reporting the "*highest* QAM level[s] *that can be used*" on each channel, and
4 selecting bit loading based on those values. (Hochwald Decl. ¶ 49 (emphases added).)
5 But contrary to that explanation and to the patent, Defendants' proposed construction
6 requires selecting the "*lowest* modulation values." Referring back to Fig. 10C as an
7 example, this would require selecting 16 QAM for carrier numbers 1 and 2 because
8 that is the *lowest* value that both channels AB and AC support. ('759 Pat., Figs. 10B–
9 C.) This is inconsistent with both Figure 10C and the invention's purpose of
10 "optimizing . . . bit distribution." (*Id.* at 7:12–14.)

11 Defendants' construction also erroneously conflates "channel paths" with
12 "carriers." A "channel path" is the signal pathway between devices. A "carrier" is a
13 specific frequency used to transmit bits. Those terms are not synonymous: "multiple
14 different [modulation] values may be used for . . . different carriers" on the "same
15 [channel] path." (Holobinko Decl. ¶ 48.) Thus, Defendants' construction also
16 confusingly suggests that the "lowest modulation values" would be the lowest value
17 for the channel as a whole (that is, across all carriers within the channel), which gets
18 even further away from optimizing throughput, the core purpose of "bit loading."

19 Defendants' construction appears to derive from a single sentence in the '759
20 Patent's specification which states that the common scheme results in "choosing the
21 lowest corresponding modulation value for each carrier number." ('759 Pat. at 10:49–
22 53.) But Defendants take this sentence out of context. The "corresponding" values
23 referred to in this sentence are in fact the *maximum* modulation values supported by
24 each carrier. (*See id.* at 10:6–57, Figs. 10A–C.) By pulling the language out of
25 context, Defendants' construction turns the purpose of the invention on its head.
26 Entropic's construction should be adopted, and Defendants' construction rejected.

27 ///

28 ///

E. '802 Patent

The '802 Patent recites methods for transmitting packets and admitting new devices into a local coaxial network. It uses a “beacon packet” that is formatted to provide information to new devices (even in unknown or poor conditions) so they can join the network and receive data from other devices.

1. “control and data packet” / “data and control packet” ('802 Pat., cls. 3, 4)

Entropic’s Construction	Defendants’ Construction
A packet that may contain either a control payload or a data payload	Plain and ordinary meaning

The '802 Patent makes clear to persons of skill that a “control and data packet” or “data and control packet” may contain *either* a control payload *or* a data payload, but a single packet need not contain *both*. Defendants, however, propose to contradict the intrinsic evidence under the guise of a “plain and ordinary meaning” that erroneously requires the packet to contain both payloads. Because Entropic’s construction correctly reflects the scope of the term as used in the '802 Patent, that meaning should be adopted.

The specification, which refers to the data and control packet as a “data/control packet,” confirms that this packet may contain either a control payload or a data payload: “The *data/control packet may have* a . . . header followed by a variable length payload The payloads, for example, may be *either control payload or data payload.*” ('802 Pat. at 24:50–54 (emphases added).) Figure 18 depicts “control payload” and “data payload” as alternatives, confirming that a packet need not contain both. (*Id.* at 5:27–28, Fig. 18.) And Figure 19, which shows the fields of the data and control packet’s header, describes the packet as having a *single* indicator that defines the packet’s type, such as “0x2” for a “Link control” packet or “0x3” for an “Ethernet unicast/broadcast” packet. (*Id.* at 5:29–30, Fig. 19.) Each of these types,

1 in turn, corresponds to a “control” payload or “data” payload. (*Id.* at 24:52–25:2
2 (describing “Ethernet” as a “data payload” and “link control” as a “control
3 payload”).) Thus, the intrinsic evidence is clear that a “data and control packet” may
4 contain a data payload or a control payload and need not contain both.

5 The claim language confirms this understanding. Claim 3 recites a “data and
6 control packet” that has “a header and a variable length payload.” (*Id.*, cl. 3.) The “a”
7 in “a variable length payload” indicates that the packet may contain only one payload
8 and need not contain multiple payloads or types of payloads. Further, the claimed
9 “header” contains a “packet type field,” which can indicate whether the packet
10 contains control information (e.g., link control) or data (e.g., Ethernet). (*Id.*, cl. 3, Fig.
11 19, 25:36–47.) The modifier “data and control” simply indicates that the same format
12 is used for packets with data payloads or control payloads, not that a single packet
13 must contain both payload types.

14 Defendants have not yet articulated what they believe the “plain and ordinary
15 meaning” of this term to be. Given Defendants’ refusal to accept Entropic’s proposal,
16 however, it appears Defendants’ “plain meaning” requires the packet to contain **both**
17 a data payload and a control payload. This is incorrect.

18 First, Defendants’ proposal finds no support in the specification. Nowhere does
19 the ’802 Patent describe a data and control packet that contains **both** data payloads
20 and control payloads. Indeed, the intrinsic evidence that Defendants cite—including
21 column 24:38–25:35 and Figures 18 and 19—all supports Entropic’s proposal by
22 describing a packet that may contain a data **or** a control payload. (6/28/24 Joint Claim
23 Construction Statement, Appendix A at A-19–21, ECF No. 525.) In fact, Defendants’
24 “plain meaning” would improperly exclude the only embodiment in the
25 specification—a clear sign that their position is incorrect. The Federal Circuit has
26 addressed the exact situation presented here and has confirmed that “and” should not
27 be read as conjunctive (i.e., requiring both options) when to do so would exclude the
28 only embodiment. *Kaufman v. Microsoft Corp.*, 34 F.4th 1360, 1373 (Fed. Cir. 2022)

(rejecting argument that “and” must be conjunctive because “so interpreted, the language would read out the only embodiment”); *Ortho-McNeil Pharm., Inc. v. Mylan Lab’ys, Inc.*, 520 F.3d 1358, 1362 (Fed. Cir. 2008) (“Without question, this passage within the specification shows use of the word *and* to join alternatives.”).

Second, Defendants provide no evidence that “data and control packet” has an “ordinary meaning” in the art. (See ECF No. 525 at A-19–21 (listing no evidence in Joint Claim Construction Statement).) For example, they cite no expert testimony or technical dictionaries. (*Id.*) The term should thus be given “its meaning to the ordinary artisan after reading the entire [’802] [P]atent,” which is a packet that may contain a data payload or a control payload. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005).

2. “beacon packet” (’802 Pat., cls. 3, 4)

Entropic’s Construction	Defendants’ Construction
A type of robust packet used to provide basic timing and control information	Plain and ordinary meaning

With respect to “beacon packet,” Entropic proposes that the term should be given the meaning it has in the ’802 Patent, as Entropic proposes. Defendants, in contrast, propose a generic “plain and ordinary meaning,” despite the fact that the term does not have a single plain meaning and is used differently in different contexts.

To begin, Defendants’ “plain and ordinary meaning” construction cannot be correct because the term “beacon packet” has different meanings even in the computer networking context. For example, in a token ring network (a type of network using coaxial cabling), a beacon identifies potential errors or malfunctions. (Holobinko Decl. ¶ 58.) But in a WiFi network, beacons are used to announce network information to new devices, not to signal potential errors. (*Id.*; Jacobsen Decl. ¶ 61.) Similarly, the meaning of a “beacon packet” can vary based on whether

1 the beacon is sent to devices already on the network as compared to devices seeking
2 to join the network. (Holobinko Decl. ¶¶ 58–60.) Thus, the meaning of “beacon
3 packet” can vary based on the context in which the term is used.

4 Because a “beacon packet” can have different meanings, a person of skill
5 would look to the specification. *See Kaneka Corp. v. Xiamen Kingdomway Grp. Co.*,
6 790 F.3d 1298, 1304–05 (Fed. Cir. 2015) (construing adjective “sealed” based on
7 usage in the specification because “sealed” can have more than one plain meaning in
8 the art). Here, the specification is clear that a “beacon packet” refers to a “robust”
9 packet used to provide “timing and control information”:

- 10 • “*One of the robust packets may be called a beacon* that may be sent
11 at anytime, no matter the quality of the link, *to provide the basic*
12 *timing and control information* that may be required for robust
13 network operation.” (’802 Pat. at 9:44–47 (emphases added).);
- 14 • “*The Beacon messages are very robust* and can be received even in
15 a *very poor channel environment*. The Beacon also has *information*
16 *about the admission time slot for the new node and other network*
17 *control information.*” (*Id.* at 13:15–19 (emphases added).);
- 18 • “When a BCN modem is activated, it attempts to locate the network
19 timing by receiving a beacon identifying *network timing and*
20 *essential network control information*” (*Id.* at 8:56–59
21 (emphasis added).)

22 A person of skill would also appreciate that “robustness” is a defining
23 characteristic of the beacon packet that distinguishes it from other types of packets in
24 the claims, such as the data and control packet. A “beacon packet” must be “robust”
25 because it is sent to new nodes that have not yet joined the network, and thus over a
26 channel of unknown quality, which may be poor. (Holobinko Decl. ¶ 60.) A robust
27 packet provides a reasonable likelihood of successful reception in various potential
28 conditions, good or bad. By contrast, a data and control packet need not be robust

1 because it is sent to nodes already on the network, when channel conditions are
2 known and can be accounted for. (*See id.*)

3 Further, the claims and specification confirm that the “beacon packet” provides
4 timing and control information. In the claim, the beacon packet comprises several
5 fields that relate to timing (e.g., admission frame length) and control (e.g., network
6 coordinator ID field). (’802 Pat., cls. 3, 4.) The specification confirms this as well, as
7 the beacon is repeatedly and exclusively described as providing information about
8 timing and admission to the network. (*E.g., id.* at 13:15–19, 9:44–47.)

9 Defendants propose “plain meaning,” but they have yet to articulate what that
10 meaning is. Their expert, Dr. Jacobsen, suggested that it refers to a “packet that is
11 transmitted to notify other transceivers in the area about information associated with
12 the network.” (Jacobsen Tr. 88:8–12.) But this meaning is inaccurate in several ways.
13 First, it is too broad because it would also describe the distinct “data and control
14 packet.” That packet is also sent to other devices on the network and contains
15 information associated with the network, such as the network system time reflected
16 in the “transmit clock.” (’802 Pat., cls. 3, 4, Fig. 19.) Second, Dr. Jacobsen’s “plain
17 meaning” fails to capture the key “robustness” that differentiates the claimed “beacon
18 packet” from other types of packets and is integral to its purpose in the ’802 Patent.

19 **3. “admission window” (’802 Pat., cls. 3, 4)**

20

Entropic’s Construction	Defendants’ Construction
Admission window field	Indefinite

23

24 The claim language makes clear that the recited “admission window” is a field
25 within a beacon packet. Further, the specification and file history of the ’802 Patent
26 confirm that the recited “admission window” refers to a time period for admitting
27 new nodes to a network. Accordingly, a POSITA would understand this term to recite
28 an “admission window field” and would be reasonably certain as to its meaning.

1 a) **“Admission Window” is a field in a beacon packet**

2 The structure of the claims makes clear that an “admission window” is a field
3 in a packet. As recited in claims 3 and 4, the “admission window” appears alongside
4 a series of fields within the claimed “beacon packet”: “channel number field, change
5 field, sequence number field, network coordinator ID field, next beacon index field,
6 admission frame length field, admission window, asynchronous MAP length field
7 and a beacon Cyclic Redundancy Checking (CRC) field.” (’802 Pat., cls. 3, 4.) As is
8 well-known in the art, and as both parties’ experts agree, packets contain information.
9 (Holobinko Decl. ¶ 102; Jacobsen Tr. 93:12–24.) Thus, a person of skill would
10 understand that an “admission window” within a packet would refer to information
11 about that window (i.e., a field), rather than the actual window itself.

12 The file history confirms that the claimed “admission window” refers to an
13 “admission window field.” During prosecution, the applicants stated that “the fields
14 of the beacon allow a new node entering the network to determine the time at which
15 an admission slot will be available for the new node to make an admission request
16 (i.e., *the recited admission window field*).” (Ex. 18, ’802 Pat. File History, 5/24/10
17 Resp. to Final Office Action at 8 (emphasis added).) Given the intrinsic evidence and
18 the well-understood structure of a packet, a person of skill would know that
19 “admission window” refers to an “admission window field” even though the word
20 “field” is not found in the claim language.

21 b) **“Admission Window” is reasonably clear to POSITA**

22 A person of skill would also be reasonably certain as to the meaning of
23 “admission window.” As the language itself suggests, an admission window relates
24 to the admission of devices to a network, and in particular to the window of time in
25 which they can join or be admitted. (Holobinko Decl. ¶ 101; *see also* Jacobsen Tr.
26 108:10–21.) This is consistent with the purpose of the packet that contains the
27 admission window—the beacon packet. The parties agree that the purpose of the
28 beacon packet is to provide information about the network, such as information that

1 allows a device “to see [the network] and then find out at [sic] what it needs to do to
2 get on that network.” (Jacobsen Tr. 89:1–15; *see id.* at 88:8–12.)

3 The specification confirms as much by explaining how the beacon packet
4 contains information about admission timing. Column 13 explains that the beacon
5 “has information about the admission time slot for the new node” and that a new node
6 uses that information to “access the admission time slot.” (’802 Pat. at 13:17–24.)
7 Column 8 likewise states that the beacon packet contains information “including
8 network admission area,” and describes that “area” in terms of time. (*Id.* at 8:54–63.)
9 Despite minor variations in language, a person of skill would understand that these
10 disclosures describe the admission window, i.e., the window of time in which a new
11 node can be admitted. (Holobinko Decl. ¶ 103.) And the file history likewise confirms
12 that the claimed admission window relates to “the time at which an admission slot
13 will be available for the new node to make an admission request (i.e., the recited
14 admission window field).” (Ex. 18 at 8–9.)

15 Defendants’ expert opines that “admission window” is indefinite because it is
16 not a well-known term in the art and the specification does not clearly define it.
17 (Jacobsen Decl. ¶¶ 78, 88.) But her opinion is based on a contrived analysis.
18 Dr. Jacobsen searched only for “admission window” as a phrase, rather than looking
19 for substantive discussions about admission timing in the context of beacon packets.
20 (*Id.* ¶¶ 79, 89.) As a result, her search missed nearly every relevant disclosure in the
21 patent, such as the disclosures described above about “the timing of admission area”
22 (e.g., ’802 Pat. at 8:54–63), “admission time slot” (e.g., *id.* at 13:11–39), and
23 “network admission area” (e.g., *id.* at 25:13–24). (*See* Holobinko Decl. ¶ 103.)
24 Further, her word-search analysis appears result-oriented and contradicts the
25 methodology she used elsewhere. For “admission window,” she looked only for the
26 entire phrase, but when reviewing other claim language, such as “channel number
27 field,” she looked for the word “channel” alone. (*See* Jacobsen Decl. ¶ 117 (“The
28 written description uses the term ‘channel’ many times and in many contexts.”).)

Defendants’ expert also contends that the term is indefinite because the specification refers to “admission window 4122,” whereas the field labeled “4122” in Figure 41 refers to an “Admission/robust window PHY profile.” (*Id.* ¶ 82 (citing ’802 Pat. at 28:67, Fig. 41).) But she admits that this disclosure would not confuse a person of skill at all because they would know that a PHY profile is not an “admission window.” (*Id.*; Jacobsen Tr. 109:1–14.) A person of skill would therefore understand the reference to “admission window 4122” as simply a truncated version of field 4122’s description and would find no inconsistency between this description and the applicants’ explanation of the “admission window” in the file history. Accordingly, the person of skill would be reasonably certain that the claimed “admission window” is an “admission window field” as described in the specification and file history.

F. ’539 Patent

The ’539 Patent recites a modem that uses an “echo profile probe” to measure “node delay spread,” which measures how different parts of a signal arrive at different times based on how the signal travels through different pathways in a network. In response to this measurement, the modem optimizes parameters to account for the measured delay spread.

1. “node delay spread” (’539 Pat., cl. 1)

Entropic’s Construction	Defendants’ Construction
Plain meaning, not indefinite	The difference in the amount of delay encountered by different components of the same signal due to the various frequencies that make up the signal used to communicate the echo probe

The term “node delay spread” should be given its plain meaning, as used in the specification and confirmed explicitly during prosecution. Defendants improperly propose to re-write the term based on a stray reference in the file history to “delay

1 . . . due to the various frequencies” that is neither explained in the file history nor
2 supported by the specification.

3 Claim 1 recites the use of an “echo profile probe” to measure “node delay
4 spread.” Both parties’ experts agree that “node delay spread” in this context has a
5 well-known meaning that refers to how different parts of a signal can arrive at a
6 receiver at different times, creating an “echo.” (Holobinko Decl. ¶ 49; Jacobsen Decl.
7 ¶¶ 179–81; Jacobsen Tr. 116:15–117:6.) This delay is also referred to as “multi-path
8 delay spread” because it can result from a signal reaching a destination via multiple
9 paths of different lengths, meaning the arrival of the signal on some paths is
10 “delayed” relative to others. (Holobinko Decl. ¶¶ 49–52.) The plain meaning of
11 “delay spread” is the difference in these arrival times and has nothing to do with
12 differences in frequencies. (*See id.* ¶ 49.)

13 The specification uses “delay spread” consistent with this well-known
14 meaning. The patent describes measuring delay spread in terms of “multi-path delay
15 spread,” which a person of skill would recognize as the plain meaning. (*Id.*; ’539 Pat.
16 at 14:13–15.) The ’539 Patent also incorporates by reference several applications that
17 reinforce that same meaning. (’539 Pat. at 1:6–19 (incorporating four provisional
18 applications); *id.* at 10:7–11 (incorporating the ’518 Patent).) For example,
19 provisional application 60/632,797, explains that the “echo profile probe” (which
20 measures node delay spread) is used “to accommodate echo and multipath.” (Ex. 19,
21 Provisional Pat. Appl. No. 60/632,797 ¶ 054.) A person of skill would recognize that
22 this description aligns with the plain meaning of “delay spread” rather than a special
23 meaning. (*See* Holobinko Decl. ¶ 50.) So, too, does the ’518 Patent (incorporated by
24 reference) depict an echo that arrives later in time due to multipath effects.
25 (*See* Holobinko Decl. ¶¶ 50–51 (describing ’518 Pat. at 10:39–54, Fig. 8).) Notably,
26 neither the ’539 Patent nor any of the applications it incorporates by reference
27 describe delay spread as comparing delay “due to various frequencies,” as
28 Defendants’ construction appears to require. (*Cf.* ’518 Pat. at 7:64–65 (“The length

1 of the cyclic prefix is a function of the multipath time displacement.”).)

2 The file history confirms the applicants’ intent to give “node delay spread” its
3 plain and ordinary meaning. The applicants explicitly stated that the meaning of
4 “node delay spread” was based on “the understanding that one of ordinary skill in the
5 art would have based on reading the specification.” (Ex. 10, ’539 Pat. File History,
6 4/9/13 Appeal Br. at 10.) They reiterated this intent when explaining that “[t]he
7 relationship between cyclic prefix length and multipath delay spread *is well*
8 *understood by those skilled in the art*” and that the “interpretation would be clear to
9 one of ordinary skill in the art” based on how the term was used in the specification.
10 (*Id.* at 11 (emphasis added).) In sum, the applicants used a term with a well-known
11 meaning in the art, described it consistently with that meaning in the specification,
12 and repeatedly told the Patent Office that they intended to use the plain meaning.
13 Thus, the plain meaning should govern.

14 For their proposed construction, Defendants strip a single sentence out of
15 context from the file history. This approach is contrary to Federal Circuit law and the
16 intrinsic record and should be rejected.

17 First, prosecution statements must be read in context, not in isolation. *Elbex*
18 *Video, Ltd. v. Sensormatic Elecs. Corp.*, 508 F.3d 1366, 1372–73 (Fed. Cir. 2007).
19 “Even if an isolated statement appears to disclaim subject matter, the prosecution
20 history as a whole may demonstrate that the patentee committed no clear and
21 unmistakable disclaimer.” *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1342 (Fed. Cir.
22 2009). Here, Defendants seize on a single isolated statement made during
23 prosecution: “the ‘delay spread of the network’ refers to the difference in the amount
24 of delay encountered by different components of the same signal due to the various
25 frequencies that make up the signal used to communicate the echo probe.” (Ex. 10 at
26 10–11.) But *immediately* before and after this statement, the applicants were explicit
27 that the meaning of “delay spread” was “based on reading the specification” and
28 “well understood by those skilled in the art.” (*Id.*) And nowhere else in the file history

1 do the applicants refer to “various frequencies” or measuring delay based on
2 frequencies. Thus, a person of skill could not discern what the isolated phrase “due
3 to the various frequencies” means. (Holobinko Decl. ¶ 56.) This makes the statement
4 too vague and ambiguous to alter the plain meaning. *Ecolab*, 569 F.3d at 1342–44.

5 Further, the stray reference to “various frequencies” was irrelevant to
6 distinguishing the art cited during prosecution. The prior art at issue, a reference
7 known as “Draves,” measured delay between two entirely different signals, rather
8 than delay between components of the same signal. (Ex. 10 at 10–11.) Nothing in
9 Draves referred to delay spread at all, let alone delay spread based on a single
10 frequency. Thus, the plain meaning alone distinguished Draves, as both parties’
11 experts agree. (Holobinko Decl. ¶ 56; Jacobsen Tr. 120:11–24.) When viewed as a
12 whole, the file history makes clear that the applicants did not depart from the plain
13 meaning of delay spread. *See Elbex*, 508 F.3d at 1372.

14 Second, the isolated statement Defendants cite cannot redefine “delay spread”
15 because it is “unsupported by even a shred of evidence from the specification.” *Elbex*,
16 508 F.3d at 1372. According to Defendants’ expert, their construction refers to a
17 concept known as “group delay” which, unlike node delay spread, has a “frequency
18 component.” (Jacobsen Tr. 114:5–14, 117:7–15.) But as Defendants’ expert admits,
19 the ’539 Patent never refers to “group delay” (i.e., measuring delay in terms of
20 frequency) or probing or comparing delay on various frequencies. (*Id.* at 114:15–
21 115:9.) Thus, just like in *Elbex*, the isolated prosecution statement here cannot change
22 the meaning of a term to one that has no support in the specification. 508 F.3d at
23 1372.

24 Indeed, not only is Defendants’ proposal unsupported, but it also contradicts
25 the intrinsic evidence. Dependent claims 3 and 6 recite a payload of the echo profile
26 probe that “*is transmitted* with a binary phase shift keying (BPSK) modulated single
27 carrier *at the center frequency* of the channel.” (’539 Pat., cls. 3, 6 (emphases
28 added).) Because the payload of the echo profile probe may be transmitted at a single

1 frequency, the proper construction cannot require the echo profile probe to be made
2 up of “various frequencies.”

3 Finally, Defendants’ construction is improper because “[r]epresentations
4 during prosecution cannot enlarge the content of the specification.” *Biogen, Inc. v.*
5 *Berlex Lab’ys, Inc.*, 318 F.3d 1132, 1140 (Fed. Cir. 2003); *see also Elbex*, 508 F.3d
6 at 1372. Here, the applicants invoked this principle explicitly, telling the examiner
7 that they were “bound by the original language of [the] disclosure and cannot go
8 beyond the limits of that disclosure.” (Ex. 10 at 11.) But the specification does not
9 disclose anything about “group delay” or delay “due to various frequencies,” as
10 Defendants’ expert admits. (Jacobsen Tr. 114:15–115:9.) Thus, as a matter of law,
11 the applicants could not have re-defined “node delay spread” to have the meaning
12 Defendants now propose.

13 **2. “optimizing the preamble and cyclic prefix requirements or**
14 **other parameters” (’539 Pat., cl. 1)**

15

Entropic’s Construction	Defendants’ Construction
Plain meaning, not indefinite	Indefinite

16
17
18

19 For this term, because a person of skill would be reasonably clear about (1) the
20 scope of “optimizing . . . other parameters” and (2) how to read the conjunctions
21 “and” and “or” from the intrinsic and extrinsic evidence, Defendants’ indefiniteness
22 arguments should be rejected and the plain meaning adopted.

23 **a) “Optimizing” and “other parameters” are reasonably**
24 **clear to a person of skill**

25 To begin, the claim language gives the person of skill substantial guidance
26 about the meaning of “optimizing” and the “other parameters.” First, “optimizing”
27 must be performed by the “MAC Layer” of the claimed modem. (’539 Pat., cl. 1.)
28 Second, “optimizing” occurs in the modem that transmits the probe, not the receiving

1 device. (*Id.*) And third, “optimizing” is done in response to the measured node delay
2 spread. (*Id.*) Thus, the person of skill knows which device and which part of that
3 device performs optimization, and based on which measurement. (*See* Holobinko
4 Decl. ¶ 88.) For the same reason, the person of skill would understand the boundaries
5 of the “other parameters” to be optimized: parameters that have meaning at the MAC
6 layer and can be adjusted in response to measured delay spread. (*Id.* ¶ 89.)

7 Further, a person of ordinary skill would understand what it means to
8 “optimize” parameters based on measured node delay spread. As the specification
9 teaches, “[t]he cyclic prefix length is dependent on the multi-path delay spread in the
10 cable system.” (’539 Pat. at 14:13–15.) A cyclic prefix is appended to the beginning
11 of a transmission to combat multipath interference. (*See* Holobinko Decl. ¶¶ 86–87.)
12 A person of skill would know the relationship between cyclic prefix and multi-path
13 delay spread: if the spread is high, a longer prefix is used to reduce intersymbol
14 interference, and if the spread is low, a shorter prefix is used to increase bandwidth.
15 (*Id.* ¶ 86.) The person of skill would also see this same concept illustrated in Figure
16 22, which discloses using a long cyclic prefix initially (when delay spread is
17 unknown) and then modifying it after the echo profile probe (EPP) determines the
18 node delay spread. (*Id.* ¶ 87; ’539 Pat., Fig. 22.) And the person of skill would know
19 that other parameters, like the channel estimate section of a packet, can be optimized
20 in a similar manner by adjusting the length of “variable length” elements within that
21 section. (’539 Pat. at 16:4–13.)

22 Importantly, the claimed “optimizing” is tied to a known measurement (node
23 delay spread) that has a well-known relationship to network performance. (Holobinko
24 Decl. ¶¶ 86–87.) This distinguishes the claimed optimizing from cases where
25 “optimizing” was found to be indefinite because it was purely subjective and based
26 on what was “most important to a particular user.” *See Intell. Ventures I LLC v. T-*
27 *Mobile USA, Inc.*, 902 F.3d 1372, 1381 (Fed. Cir. 2018) (quotations and citations
28 omitted). Based on background knowledge and the specification, a person of skill

1 would be reasonably certain as to the scope of the claimed “optimizing” and the
2 “other parameters” that could be optimized.

3 **b) “And” and “or” are reasonably clear to a person of**
4 **skill**

5 A person of skill would also be reasonably certain about how to read the “and”
6 and “or” conjunctions in the disputed phrase. Based on standard conventions in the
7 field, in combination with the specification and file history, the person of skill would
8 be reasonably certain that the phrase means “optimizing (the preamble and cyclic
9 prefix requirements) or (other parameters).”

10 As a start, the person of skill would appreciate that the most natural reading of
11 this phrase is the one that flows from the order in which the “and” and “or” appear.
12 Here, the phrase refers first to “the preamble and cyclic prefix requirements,”
13 followed by “or other parameters.” This reading is also consistent with the order of
14 precedence for logical operators as used in the art, which gives precedence to “AND”
15 over “OR.” (Holobinko Decl. ¶ 92; Ex. 20, Entropic-DISH-MoCA_050038–742 at
16 Entropic-DISH-MoCA_050164.)

17 The file history confirms this interpretation. During prosecution, both the
18 applicant and the examiner treated “preamble and cyclic prefix requirements” as a
19 combined phrase. (Ex. 21, ’539 Pat. File History, 12/17/12 Resp. to Final Office
20 Action at 5–6 (“[T]he Examiner relies on paragraphs 43 and 38-40 of Walton et al.
21 to disclose the *optimizing of the preamble and cyclic prefix requirements* in
22 response to the measured node delay spread” (emphasis added)); *see also* Ex.
23 22, *id.*, 8/20/12 Resp. to Office Action at 5 (same); Ex. 23, *id.*, 1/2/13 U.S.P.T.O.
24 Advisory Action at 2.) A person of skill would thus be reasonably certain as to the
25 meaning of the claimed phrase based on a review of the intrinsic evidence as a whole.

26 **G. ’213 Patent and ’422 Patent**

27 The ’213 and ’422 Patents recite methods for allocating bandwidth within a
28 network. For this allocation, a node takes on the role of “Network Coordinator” (NC).

1 In that role, the node obtains information about bandwidth used by other nodes and
2 then aggregates that information or allocates bandwidth to meet certain “quality of
3 service” (QoS) requirements.

4 **1. “Network Coordinator (NC) node” (’213 Pat., all claims; ’422**
5 **Pat., cls. 1–4, 6)**

6

Entropic’s Construction	Defendants’ Construction
A node dynamically assigned to coordinate communication on a network	Plain and ordinary meaning

7
8
9
10

11 “Network Coordinator (NC) node” should be given the meaning provided by
12 the patent and used in the industry, as Entropic proposes. It is unclear what else
13 Defendants’ non-definition is meant to encompass, but their apparent attempt to adopt
14 an entirely generic meaning would ignore the patent’s naming convention and
15 description and illogically broaden the term.

16 Each time this term appears in the asserted claims, it is capitalized—either
17 using its full name, “Network Coordinator,” its given acronym, “NC,” or both. (*E.g.*,
18 ’213 Pat., cls. 1–2; ’422 Pat., cls. 1–4, 6.) When, as here, a term is capitalized and
19 given an acronym, that signifies a specific meaning. *See Ocean Semiconductor LLC*
20 *v. Huawei Device USA, Inc.*, No. 4:20-CV-00991-ALM, 2022 WL 389916, at *18–
21 19 (E.D. Tex. Feb. 8, 2022) (rejecting party’s proposal of “[n]o construction . . .
22 necessary” where “the specification capitalizes the phrase ‘Advanced Process
23 Control framework,’ and provides a description of the APC,” its acronym). Industry
24 experts also recognize that “capitalization, quotation marks, and creation of a specific
25 acronym are commonly used in the field to indicate that a term is given a particular
26 meaning.” (Holobinko Decl. ¶ 62.)

27 Here, the NC node’s “particular meaning” is found where the patent introduces
28 the term—capitalized, in quotation marks, and with an acronym:

1 The emerging Multimedia over Coax Alliance (MOCA) standard
2 architecture impacts this problem in that (1) network behaviors
3 *dynamically assign a device the “Network Coordinator” (NC) role* in
4 order to optimize performance, (2) only the device in the *NC role* is
5 known to be able to *schedule traffic for all other nodes in the network*,
6 and (3) form a full mesh network architecture between any device and
7 its peers.

8 (’213 Pat. at 1:55–62 (emphases added).) The patent thus sets forth two key features
9 of the NC node, each of which Entropic’s construction captures. First, the NC node
10 is dynamically assigned—as confirmed by the patent’s “refer[ence] to a ‘role’ that a
11 device may take on, rather than a dedicated piece of hardware.” (Holobinko Decl.
12 ¶ 64.) Second, the NC node performs functions that coordinate communication on a
13 network, such as scheduling traffic. Entropic’s construction also properly omits
14 language from the third item because it does not refer to or relate to the “NC role.”

15 The specification’s description of the network coordinator is consistent with
16 the industry’s contemporaneous understanding. For instance, as set forth above, the
17 patent refers to the term “Network Coordinator” in the context of a MoCA network.
18 (’213 Pat. at 1:55–62.) Technical documents regarding MoCA confirm that Network
19 Coordinator, in that context, refers to a node that is dynamically assigned rather than
20 a dedicated piece of hardware. For example, a Cisco presentation describing
21 numerous in-home technologies explains that a “Network Coordinator” is “selected”
22 and a “backup NC” can “take[] over.” (Ex. 24, Entropic-DISH-MoCA_049975–
23 50007 at Entropic-DISH-MoCA_049990–91.) Relatedly, a certification document
24 outlines an “NC Handoff Test” to ensure that the NC role properly switches from a
25 “primary” to “backup NC node.” (Ex. 25, Entropic-DISH-MoCA_051955–78 at
26 Entropic-DISH-MoCA_051963.) Another MoCA presentation explains that “[a]ny
27 MoCA node can become a Network Coordinator (NC) node.” (Ex. 26, Entropic-
28 DISH-MoCA_050743–57 at Entropic-DISH-MoCA_050752.) And the MoCA

1 specifications repeatedly reflect the NC node’s dynamic nature, stating that “one of
2 the nodes is automatically selected to be the Network Coordinator (NC)” and that a
3 “Backup NC” will “assume[] the duties of [the] Network Coordinator.” (Ex. 27,
4 Entropic-DISH-MoCA_051764–954 at Entropic-DISH-MoCA_051809, 051811.)

5 Although Defendants oppose Entropic’s construction, they present no
6 evidence that it is inaccurate. Dr. Hochwald’s declaration does not include any
7 technical reason why Entropic’s construction is incorrect, nor did he offer any reason
8 during his deposition. (Ex. 28, Hochwald 7/16/24 Dep. (“Hochwald Tr.”) 46:21–
9 47:7.) To the contrary, the opinions that Dr. Hochwald provides support Entropic’s
10 construction. Dr. Hochwald explained that “network coordinator” is a term
11 generically “used by many practitioners in the art from many different corporations
12 operating in this field to describe a node in many different network contexts.”
13 (Hochwald Decl. ¶ 76.) He also admitted that, when the ’213 Patent refers generally
14 to such prior art network coordinators, it does so in lowercase. (Hochwald Tr. 68:14–
15 19; ’213 Pat. at 2:4–7.) In contrast, when the patent refers to the Network Coordinator
16 of its invention, it consistently uses the “capital N, capital C” naming convention.
17 (Hochwald Tr. 69:8–11; *e.g.*, ’213 Pat. at 3:23–28, 4:2–8, 4:51–57.) Accordingly, the
18 ’213 Patent recognizes a distinction between generic network coordinators and its
19 own Network Coordinator (NC) node, and is expressly describing and claiming the
20 latter.

21 **2. “cost” (’213 Pat., cls. 5, 7)**

22 Entropic’s Construction	23 Defendants’ Construction
24 A measure of the specific bandwidth 25 required to support a given PQoS flow	26 Plain and ordinary meaning

26 The specification’s explicit definition of “cost” as a measure of bandwidth
27 should govern here, as Entropic proposes. Defendants’ “plain meaning” construction,
28 in contrast, ignores the specification’s definition and would distort the meaning of

1 the claims to capture something as far afield as a dollar amount.

2 Claim 5 of the '213 Patent refers to a source node's and egress node's "cost
3 associated with admitting the [quality-of-service] flow." ('213 Pat. at 40:1–6.)
4 Similarly, claim 7 refers to "the source node's cost of supporting the requested
5 guaranteed quality of service flow." (*Id.* at 40:15–18.) In both claims where this term
6 appears, the "cost" is that of the quality-of-service flow; the patent does not claim
7 any other type of network cost. The specification, in turn, explicitly defines what that
8 cost of a flow is: "[t]he Cost of a Flow (CF) is a measure of the specific bandwidth
9 required to support a given pQoS flow." (*Id.* at 17:34–37.) Because the patentee acted
10 as its "own lexicographer[]" when defining the cost of a flow, "that definition
11 controls," and is exactly what Entropic proposes. *Kyocera Senco Indus. Tools Inc. v.*
12 *Int'l Trade Comm'n*, 22 F.4th 1369, 1378–79 (Fed. Cir. 2022).

13 Even beyond the explicit definition in the specification, the '213 Patent
14 repeatedly describes the cost associated with a flow in terms of bandwidth. It explains
15 that an NC node must decide if the "cost of all the aggregated pQoS flows" is less
16 than the "maximum available network bandwidth." ('213 Pat. at 18:40–44.)
17 Similarly, the NC node must evaluate "bandwidth-related criteria" before admitting
18 a flow. Nowhere does the patent describe the cost associated with a flow in terms of
19 anything other than bandwidth. (*Id.* at 27:44–56.)

20 The patent's embodiments and the file history reinforce that "cost" refers to
21 bandwidth, not "money" or some other undefined "resource," as Dr. Hochwald
22 suggests. (Hochwald Decl. ¶¶ 82–83.) Dr. Hochwald first relies on an "alternative
23 embodiment" in which "the CF [cost of flow] is provided as a transfer rate." ('213
24 Pat. at 17:38–41.) But, as Dr. Hochwald conceded at his deposition, transfer rate—
25 and its corresponding units of measurement, Mbit/s—is just another way to express
26 bandwidth; it is not an *alternative to* bandwidth. (Hochwald Tr. 59:6–12, 17–25.)
27 Thus, even in Dr. Hochwald's "alternative embodiment," the cost associated with a
28 flow is measured in terms of bandwidth. Dr. Hochwald also relies on an amendment

1 during prosecution in which certain claims were changed from “cost of the flow” to
2 “cost associated with admitting the flow.” (Hochwald Decl. ¶ 90 (citing ’213 Pat. File
3 History, 5/13/17 Resp. to Non-Final Office Action at 3).⁴) This distinction is
4 irrelevant, though, because the claims have always been directed to the *flow’s* cost,
5 not some other network cost. Because the intrinsic evidence is clear that the cost of
6 (or associated with) a flow refers to a measure of bandwidth required to support that
7 flow, that definition is correct.

8 **H. ’681 Patent**

9 The ’681 Patent claims a way of “synchronizing a plurality of nodes on a
10 communication network.” (’681 Pat. at 14:17–18.) Consistent with Entropic’s
11 proposed construction for “node,” (*see supra* § III.A.2), “nodes” include electronic
12 devices such as “TVs, set top boxes and computers.” (’681 Pat. at 2:27–28.) The
13 times at which nodes transmit must be scheduled and synchronized to “avoid[] packet
14 collisions” if multiple nodes transmit at once. (*Id.* at 2:37–39.) That process includes
15 “ranging”—determining how long it takes a packet to travel from one node to the
16 other. (*Id.* at 3:58–60.) This information can be used to determine when a signal
17 pathway is free for transmission. (*Id.* at 3:60–65.) For a node to measure how long it
18 takes for a packet to traverse the network, it needs to know, in its own clock time,
19 when that packet was transmitted. And because the clocks on two nodes in a network
20 may differ due to “clock drifts,” a node cannot assume that its clock matches that of
21 a second node. (*See id.* at 3:1–9.)

22 Claim 1 addresses this problem. The “first node” seeks to measure a delay to a
23 “second node.” In exemplary terms, the first node sends the current time according
24 to its own internal clock (say, 1:00 pm) to the destination node, plus some future time
25 when the destination node should respond (say, 1:02 pm). The destination node
26 receives the 1:00 pm clock value, updates an internal clock to that 1:00 pm value, and
27

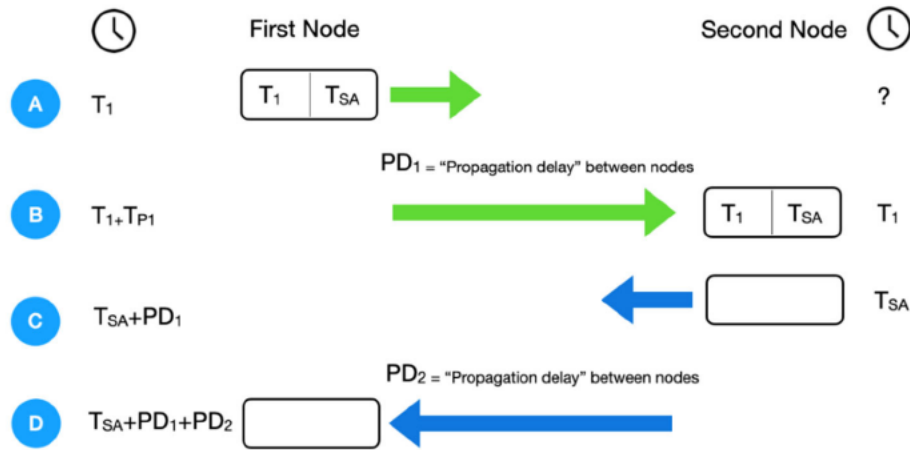
28 ⁴ Attached as Exhibit 29 to the Pieja Declaration.

1 uses that clock to wait until the prescribed 1:02 pm to respond. If there was no delay
2 in the transmissions, the arrival time of the response would be exactly 1:02 pm from
3 the point of view of the first node. But because there will be some delay in both the
4 outgoing and the responsive signal, the real arrival time will be later, perhaps 1:02:02
5 pm. The extra two seconds permits the first node to determine propagation delay.
6 In terms of the claim language, the method begins (**step “A” below**)⁵ by “transmitting
7 a first packet from the first node to the second node.” (*Id.* at 14:22–23.) This packet
8 includes two times: “a first packet clock time set to the local clock time of the first
9 node at transmission [here, T_1], and [T_{SA}] a scheduled arrival clock time.” (*Id.* at
10 14:23–26.) The “scheduled arrival clock time” is thus a time known to and chosen by
11 the first node. In the second step (**step “B” below**), the first packet arrives at the
12 second node. The second node then “set[s] the local clock time of the second node to
13 the first packet clock time,” (*id.* at 14:27–28)—the time when the first packet was
14 transmitted. Because communications are not instantaneous, it takes some time—
15 called a “propagation delay” and labeled PD_1 —for the packet to cross the network.
16 Thus, when the first packet arrives at the second node, and the second node’s clock
17 is set to T_1 , the first node’s clock will be ahead by the propagation delay time and
18 will thus be at $T_1 + PD_1$.

19 Next, the second node waits for its clock to advance to the “scheduled arrival
20 clock time” (T_{SA}). (*Id.* at 14:34–37.) The claim then requires “transmitting a second
21 packet from the second node to the first node, wherein *the second packet is*
22 *transmitted from the second node at the scheduled arrival clock time*” of T_{SA} (**step**
23 **“C” below**). (*Id.* at 14:34–37 (emphasis added).) Because the first node’s clock is
24 ahead of the second node’s by PD_1 , when the second packet is transmitted, the first
25 node’s clock will be at $T_{SA} + PD_1$. Finally (**step “D” below**), the second packet arrives
26 at the first node. Again, it has taken some time (PD_2) for the packet to cross the
27

28 ⁵ These method steps are depicted via a demonstrative included on page 45.

network. It thus arrives at the first node when that node’s clock is $T_{SA}+PD_1+PD_2$. Because the first node knew the packet was sent at the “scheduled arrival clock time,” it uses this value, along with “the actual arrival time,” to “calculat[e] . . . the estimated propagation delay.” (*Id.* at 14:39–42.)



1. “scheduled arrival clock time” (’681 Pat., cl. 1)

Entropic’s Construction	Defendants’ Construction
Scheduled time at which the second node is to transmit the second packet to the first node	Plain and ordinary meaning

A “scheduled arrival clock time” is a phrase the ’681 Patent coined to refer to a specific time in the network synchronization process. Entropic’s construction is drawn directly from the claim’s and the specification’s explanation of what this term means and would help clarify its meaning for the trier of fact. Defendants’ proposal provides no assistance regarding a complex claim and risks future argument contradicting the intrinsic record before the trier of fact.

To begin, the claim language confirms that Entropic’s proposal is correct. “Claim construction must begin with the words of the claims themselves.” *Endo Pharms. Inc. v. Actavis LLC*, 922 F.3d 1365, 1370 (Fed. Cir. 2019) (internal quotation omitted). In that context, the words of “the claims themselves provide substantial

1 guidance as to the meaning of particular claim terms.” *SRI Int’l, Inc. v. Cisco Sys.,*
2 *Inc.*, 930 F.3d 1295, 1304 (Fed. Cir. 2019) (quoting *Philips*, 415 F.3d at 1314). Here,
3 claim 1 supports Entropic’s construction in two ways. First, it states directly that the
4 “scheduled arrival clock time” is the time when a second node sends the second
5 packet: “the ***second packet is transmitted from the second node at the scheduled***
6 ***arrival clock time.***” (’681 Pat. at 14:34–38 (emphasis added).) Second, claim 1
7 requires the first node to “calculat[e] the estimated propagation delay” of a packet
8 from “the scheduled arrival clock time and the actual arrival time.” (*Id.* at 14:39–42.)
9 The propagation delay represents how long a packet takes to traverse the network,
10 from when it is transmitted to when it is received. (*Id.* at 3:3–5.) Because knowing
11 how long a packet took to travel across a network requires knowing when it was sent
12 and when it was received, the calculation required by claim 1 makes sense only if the
13 “scheduled arrival clock time” represents the time the second packet was transmitted.

14 The specification further supports Entropic’s construction. Figure 5 discloses
15 “a flowchart of a method for synchronizing a plurality of nodes.” (*Id.* at 6:48–50.)
16 This method maps directly to claim 1. As in claim 1, a first node (“Node#1”) sends a
17 packet to a second node (“Node#2”) (step 52), which resets its local clock (step 58)
18 and responds with a second packet (step 64), which the first node uses to calculate a
19 propagation delay (step 70) that it includes in a third packet (step 73). As in claim 1,
20 the first packet (“P1”) sent by the “first node” (“Node#1”) includes two times: “the
21 first node’s local channel time clock . . . at the time of transmission (CTC_{1,TX}); and
22 the ***scheduled channel time*** clock count (CTC_{SCHED}) at which Node#2 is to transmit
23 a second packet (P2) to Node#1).” (*Id.*, Fig. 5, element 52 (emphases added).) The
24 “scheduled . . . time clock count” thus maps to the “scheduled arrival clock time” of
25 claim 1. As Figure 5 shows, the “scheduled” time is one at which the second node
26 transmits a second packet: “Node#2 transmits P2 to Node#1 at CTC_{SCHED}.” (*Id.*,
27 element 64.)

28 ///

1 Defendants’ construction—“plain and ordinary meaning”—is inappropriate
2 for two reasons. First, it is not clear what “plain and ordinary meaning” Defendants
3 intend. As explained by Mr. Holobinko—a professional engineer with decades of
4 experience in the telecommunications field—the term is not one for which technical
5 publications, discussions, or textbooks provide a specific definition. (Holobinko
6 Decl. ¶¶ 8–17, 70.)

7 Second, a “plain meaning” construction risks confusing the jury. Although
8 Defendants have not said what their “plain meaning” is, they apparently intend to
9 suggest that it represents a time when the first packet is scheduled to *arrive*. But
10 nothing in the intrinsic record suggests that any packet arrives at the second node at
11 the “scheduled arrival clock time.” (*See id.* ¶ 76.) Further, if the first packet did arrive
12 at the second node at the “scheduled arrival clock time,” claim 1’s requirement that
13 the node transmit a second packet at that same time would be impossible to meet.
14 (*Id.*) As Mr. Holobinko explained, the second node must process the first packet,
15 extract the relevant time, reset its clock, and prepare and transmit a second packet—
16 all of which cannot happen instantaneously. (*Id.*) Defendants’ “plain meaning”
17 approach invites the jury to read each word in this phrase individually, implying that
18 because the phrase uses the words “scheduled” and “arrival,” it must be a time when
19 something is scheduled to arrive. But courts have repeatedly rejected giving a phrase
20 “an interpretation that is merely the sum of its parts.” *Intel Corp. v. Qualcomm Inc.*,
21 21 F.4th 784, 791–92 (Fed. Cir. 2021). Rather, “and decisively, [the] inquiry is not
22 limited to an analysis of the phrase in isolation.” *Id.* Because the “scheduled arrival
23 clock time” phrase *as a whole* was given a specific meaning in the context of claim
24 1 and the specification, Entropic’s construction is correct and should be adopted.

25 **IV. CONCLUSION**

26 The Court should adopt Entropic’s proposed constructions.
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Respectfully submitted,

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