

**UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

SHURE, INC.,)	
)	
Plaintiff, Counter-Defendant,)	No. 17 C 3078
)	
v.)	
)	Judge Edmond E. Chang
CLEARONE, INC.,)	
)	
Defendant / Counter-Plaintiff.)	

MEMORANDUM OPINION AND ORDER

This litigation concerns two patents on audio conferencing technology. Shure, Inc. sued its competitor ClearOne (the owner of the patents), seeking a declaration of invalidity and non-infringement at first on U.S. Patent No. 9,635,186.¹ R. 1, Compl. ¶ 1.² In response, ClearOne filed a counterclaim for infringement against Shure.³ R. 28, Counterclaim. After expedited discovery, ClearOne moved for a preliminary injunction to halt Shure’s alleged infringement of the ’186 Patent. R. 81, Mot. Prelim. Inj. ’186 Patent (redacted). The Court denied ClearOne’s motion. R. 279, Mem. Op. and Order (redacted). During the pendency of the first preliminary-injunction motion,

¹The initial complaint also included claims about U.S. Patent No. 9,264,553, which also involved audio conferencing, but the inter partes review (IPR) on that patent prompted a dismissal of those claims, R. 280, though after the IPR finished, ClearOne filed a new case on it, R. 541. The Court has subject matter jurisdiction over this case under 28 U.S.C. § 1338(a).

²Citations to the record filings are “R.” followed by the docket number and, when necessary, a page or paragraph number. Many exhibits have overlapping names or numbering, so exhibits will be identified by docket number throughout to avoid confusion.

³ClearOne’s counterclaim also named Biamp Systems Corporation and QSC Audio Products, LLC, as counter-defendants. R. 28, Counterclaim. Biamp and QSC are not involved in the preliminary injunction litigation and were later dismissed from the case. R. 141.

ClearOne was granted another audio conferencing patent, U.S. Patent No. 9,813,806, and asserted infringement on that patent too. R. 260, Second Am. Compl. ClearOne later also moved for a preliminary injunction to halt Shure's alleged infringement of the '806 Patent, also based on Shure's MXA910. R. 369, Mot. Prelim. Inj. '806 Patent (redacted). In November 2018, the Court held a hearing on that motion and took it under advisement.

Meanwhile, the parties finished fact discovery and briefed their claim construction arguments on both the '186 and '806 Patents. *See* R. 508, Shure Claim Const. Br.; R. 520 ClearOne Claim Const. Resp. (redacted); R. 522, ClearOne Claim Const. Resp. (sealed); R. 535, Shure Claim Const. Reply. The Court heard oral argument on claim construction on July 12, 2019. *See* R. 520, Minute Entry. Arguments and evidence presented for the first time at the claim construction stage are discussed below where they are relevant to issues that had already been raised in the preliminary injunction context.⁴

After hearing arguments and reviewing the parties' evidence, the Court finds that ClearOne has met its burden of demonstrating entitlement to the extraordinary

⁴This Opinion includes claim construction decisions on the following construction issues and terms, which overlap with issues raised at the preliminary injunction stage: the person of ordinary skill in the art for the '806 Patent; "beamforming microphone array"; "said beamforming microphone array integrated into said ceiling tile as a single unit"; "the drop space of the drop ceiling"; and "wherein said outer surface is coplanar with said ceiling tile."

The Court reserves its claim construction decisions on the '186 Patent terms, as well as the following terms from the '806 Patent, which do not overlap directly with issues raised at the preliminary injunction stage: "is acoustically transparent," and "used in a drop ceiling mounting configuration." The Court will issue a separate claim construction opinion on those terms.

relief of a preliminary injunction on the '806 Patent. ClearOne has shown a reasonable likelihood of success on the merits: Shure is likely infringing the '806 Patent and has not raised a substantial question of the patent's validity. ClearOne has established that it will suffer irreparable harm without a preliminary injunction, and the balance of harms and public interest tip in its favor. As discussed in the Opinion's end, the Court sets a prompt litigation schedule on the appropriate bond amount so that it may be decided and posted in order to make the preliminary injunction operative.

I. Background

A. The '806 Patent

The only patent at issue in this preliminary injunction motion is the '806 Patent (referred to by ClearOne as the "Graham Patent"). The '806 Patent claims an invention that combines a beamforming microphone array (commonly abbreviated in the industry as "BFMA") with a ceiling tile so that the BFMA can pick up sound throughout a conference room while remaining somewhat hidden from view. As ClearOne's expert, Dan Schonfeld, has explained it, "The Graham Patent covers the integration of beamforming microphones into a ceiling tile, which delivers audio through an acoustically-transparent outer surface, but conceals the microphone array on its backside, so that it can be seamlessly integrated into the drop ceiling of a room." R. 372, Schonfeld Decl. ¶ 25 (redacted).

The benefit of integrating a beamforming microphone array with a ceiling tile is that it allows the technology to be out-of-sight. In the context of audio conferencing,

the typical conference setup involves multiple attendees in one room, all communicating with attendees in another location. R. 372, Schonfeld Dec. ¶ 26 (redacted). The “conventional wisdom” has traditionally been that in such scenarios, microphones should be as close to the attendees as possible. *Id.*; R. 360, Graham Decl. ¶ 8 (“[T]he conventional wisdom was that closer is better regarding the distance between a talker and a microphone for audio conferencing.”); R. 367-1, Giza Exh. 22 at 1 (Shure blog explaining that “to an experienced audio engineer, the ceiling is the last place to mount a microphone. Why? Because it is far away from the desired audio source (the talker) ...”). At the same time, popular demand from many audio conferencing users was that microphones *not* be on conference room tables, and that they be as close to out-of-sight as possible. R. 366, Mot. Prelim. Inj. ’806 Patent at 22-23 (sealed).⁵

The development of beamforming microphones did not immediately disrupt the traditional view. As the Court explained in its decision denying ClearOne’s motion for a preliminary injunction on the ’186 Patent,

Beamforming is a technology that combines signals from multiple microphones in a microphone array to generate combined audio signals (called “beams”) that pick up sounds from a particular location. ... The advantage of a beamforming microphone is that it can focus in on the sounds that audio-conference participants want to hear (that is, people’s voices), while filtering out unwanted sounds (like background noise and paper shuffling).

⁵This Opinion cites to the public, redacted versions of filings when possible (“redacted”), but to the under-seal version of each document when necessary (“sealed”). In certain instances, the Opinion cites to a sealed filing for a general proposition that has been publicly argued or briefed by the parties, but for which some supporting facts are sealed. The public version of this Opinion does not show any redactions in those instances, simply because the general proposition described in the text of the Opinion itself is properly in the public record.

R. 279, Mem. Op. and Order at 3 (cleaned up)⁶ (redacted). ClearOne’s original beamforming microphone product, the BMA, responded to the traditional view requiring microphones located close to speakers. Because most conferencing users wanted their conferencing microphones off their conference tables, teams at ClearOne first focused on extending their ceiling-mounted beamforming microphone down into the room as far as possible, minimizing the distance between the attendees and the microphone. R. 360, Graham Decl. ¶¶ 8-10 (“ClearOne engineers ... spent several months of engineering effort to design a new ceiling mount that would allow the beamforming array to be adjustably positioned as much as 24 inches down from the ceiling in order to be closer to the audio source—the talkers in a room.”).

But in the course of product development, ClearOne engineers realized that mounting their BFMA on the ceiling—that is, increasing the distance between the BFMA and the speakers in the room—reduced the quality of the sound it produced *less* than the engineers thought it would. R. 360, Graham Decl. ¶ 9. Their beamforming technology made the audio quality better than the quality a *non*-beaming microphone would achieve when mounted on the ceiling. R. 477, Prelim. Inj. Hrg. Tr. at 76:1-9 (Graham testifying that the “actual test results indicated that the beamforming microphone array actually sounded better than the traditional ceiling microphones that were used at the time.”); R. 370, Giza Exh. 10 (sealed) (██████████
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██████████)

⁶This opinion uses (cleaned up) to indicate that internal quotation marks, alterations, and citations have been omitted from quotations. See Jack Metzler, *Cleaning Up Quotations*, 18 Journal of Appellate Practice and Process 143 (2017).

B. Alleged Infringement

The Shure MXA910 is a beamforming microphone array that “may be mounted to replace a ceiling tile.” R. 402, Shure Resp. at 16 (emphasis omitted) (redacted). The MXA910 includes [REDACTED] [REDACTED] placed in a two-foot by two-foot housing. R. 417, Cerra Decl. ¶ 12 (sealed). The array is “sized to align with the grid of a drop ceiling.” R. 407, LeBlanc Decl. ¶ 28. ClearOne alleges that Shure’s MXA910 practices all the elements of Claims 1, 4, 5, and 6 of the ’806 Patent.

II. Standard of Review: Preliminary Injunction Motions

The Patent Act authorizes courts to grant injunctions to prevent violations of patent rights. 35 U.S.C. § 283. To obtain a preliminary injunction, the moving party must show: “(1) a reasonable likelihood of success on the merits; (2) irreparable harm if an injunction is not granted; (3) a balance of hardships tipping in its favor; and (4) the injunction’s favorable impact on the public interest.” *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1350 (Fed. Cir. 2001). On likelihood of success, ClearOne must show that (1) it can likely prove that Shure is infringing the ’806 Patent and (2) that the ’806 Patent will likely withstand Shure’s challenge to its validity. *See Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1364 (Fed. Cir. 1997). “[A] preliminary injunction is an extraordinary remedy never awarded as of right.” *Wind Tower Trade Coal. v. United States*, 741 F.3d 89, 95 (Fed. Cir. 2014) (quoting *Winter v. Nat. Res. Def. Council, Inc.*, 555 U.S. 7, 24 (2008)).

III. Analysis

A. Claim Construction

Before digging into the arguments on infringement and invalidity, the Court must decide what invention the '806 Patent actually claims. Claim construction requires that the Court determine how a person of ordinary skill in the art would understand the claim terms. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). The claim's own language is the starting point, but "[c]laims must be read in view of the specification, of which they are a part." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995). Prosecution history is also "of primary significance" in determining how a claim should be understood. *Id.* at 980. Lastly, extrinsic evidence—that is, expert testimony or any other evidence outside of the patent and prosecution history—can also be considered, but carries less weight than intrinsic evidence. *Id.* at 980-982. Extrinsic evidence is mostly useful for helping the Court to understand the relevant art and to explain how the invention works. *Phillips*, 415 F.3d at 1318-19.

At the preliminary injunction stage, the parties dispute the definition of a person of ordinary skill in the art, as well as the meaning of three terms in the patent's specification and claims: (1) "beamforming microphone array"; (2) "drop space"; and (3) "ceiling tile." See '806 Patent Col. 13:12-43. As noted above, this Opinion also considers the additional arguments presented on "beamforming microphone array" and "drop space" in the claim construction briefing and the claim

construction hearing held on July 12, 2019. The Court will take each of those three terms in turn.⁷

1. Person of Ordinary Skill in the Art

The Federal Circuit has set out several factors to help courts determine the level of ordinary skill in the art through which to view claim construction. *Daiichi Sankyo Co., Ltd. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). Those factors include “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) education level of active workers in the field.” *Id.* (cleaned up).

Shure and ClearOne’s disagreement in this arena largely comes down to whether a person of ordinary skill would have experience in beamforming, specifically digital signal processing. *See* R. 369, ClearOne Mot. Prelim. Injunction at 8 (“Here, a POSITA would have ... at least one year of work experience in the field of digital signal processing.”) (redacted); R. 402, Shure Resp. at 9-10 (“The art involved in the ’806 Patent is the attachment of a BFMA in a room, and the technology involves basic mechanical or electrical attachments. ... One need not have experience in beamforming to accomplish this.”) (redacted). The parties’ arguments on this point did not change substantively between the preliminary injunction and claim

⁷Later in this Opinion, the Court will also discuss constructions of two new terms raised at the claim construction stage because they overlap with infringement and validity issues for the preliminary injunction decision. *See supra* at 2 n.4.

construction phases. *See* R. 508, Shure Claim Const. Br. at 22-23; R. 520, ClearOne Resp. at 21-22 (redacted).

On review of the competing arguments, the Court concludes that ClearOne is correct that a person of ordinary skill in the art of the '806 Patent should have experience in beamforming, likely by digital signal processing. Shure argues that “the '806 Patent does not disclose or deal with complex beamforming algorithms or teach the design of a BFMA.” R. 402, Shure Resp. at 10 (redacted). But the '806 Patent does disclose beamforming—and it discloses somehow integrating a beamforming microphone array with a ceiling tile. A person of ordinary skill looking to practice the '806 Patent would have to figure out how to make that combination work, and that in turn would require understanding digital signal processing.

Practically speaking—and being able to practice the patent is important—ClearOne is correct that most of the current applications of beamforming rely on digital signal processing, and evidence that ClearOne offered in the context of its claim construction argument on “beamforming microphone array” (discussed further below) makes that clear. To resist this, Shure’s expert, Wilfred LeBlanc, says that a digital signal processor is not the only “device capable of” performing the operations disclosed in the '806 Patent. R. 407, LeBlanc Decl. ¶ 25. But modern beamformers generally use digital signal processors: one of ClearOne’s inventors, Derek Graham, credibly testified that he had never seen an application of beamforming without a digital signal processor, though it might be theoretically possible to create one. Prelim. Inj. Hrg. Tr. at 87:15-89:10. When asked for an example of a beamformer that

does *not* use digital signal processing, Shure pointed to the Miki patent. *Id.* at 40:2-11. ClearOne argues that Miki does not teach beamforming at all.⁸ R. 440, ClearOne Reply at 14-15 (redacted). But even if the Miki patent discloses some type of beamforming, there is no evidence that any product currently on the market performs beamforming without DSP.

Given that a person of ordinary skill in the art disclosed in the '806 Patent would need a working understanding of digital signal processing,⁹ the Court adopts ClearOne's definition of a person of ordinary skill in the art: the skilled artisan must have at least one year of work experience in the field of digital signal processing.

2. Beamforming Microphone Array

As discussed earlier, the '806 Patent teaches combining a beamforming microphone array (again, commonly referred to in the industry as "BFMA") with a ceiling tile. But Shure and ClearOne disagree on exactly what comprises a "beamforming microphone array." Shure argues that a BFMA is "a plurality of

⁸It is not clear from the Miki patent what type of processor it uses, or whether its inventors would describe it as disclosing beamforming. The invention described in the patent does include "a sound-source position detection means, which detects the position of the sound source based on signals input from the aforementioned multiple sound-collection devices and then selects the input signal from the sound-collection device that is detected as the position of the sound source." R. 412-1, Patel Exh. 13, Claim 1, Lim. 2. It is unclear if this "means" describes a digital signal processor or some other type of signal processor. On the other hand, the patent also states that it does not "focus[] the sound-collection beam on a specific speaker." *Id.* ¶ 0008. So it is simply not clear whether Miki is a good example of a beamforming microphone array without a signal processor.

⁹Shure also argues that "[t]he backgrounds of the inventors of the '806 Patent" also support its definition. R. 402, Shure Resp. at 10 (redacted). But by its own admission both Derek Graham and David Lambert have degrees in electrical engineering—not just experience installing audio equipment. [REDACTED]

[REDACTED] R. 421, Patel Exh. 70, Braithwaite Dep. Tr. at 16:13-17:16 (sealed).

microphones that produce audio signals to be used to form a directional pick up pattern.” R. 419-1, Joint Claim Const. Chart. In contrast, ClearOne proposes that a BFMA consists of “microphones coupled together and positioned at predetermined locations that are used with digital signal processing algorithm to form a directional pickup pattern.” *Id.* At the preliminary injunction stage, Shure and ClearOne agreed that the relevant difference between their constructions is that ClearOne’s, in addition to microphones, includes related hardware that accomplishes the beamforming, while Shure’s does not. *Id.* At the claim construction stage, ClearOne highlighted that difference further by proposing to add the words “and related hardware capable of using a DSP algorithm to form a directional pickup pattern” to the end of its construction. R. 520, ClearOne Claim Const. Resp. at 22 (redacted); R. 548, Claim Const. Hrg. Tr. at 44:4-5 (Shure pointing out ClearOne’s addition).¹⁰

The other point of dispute is whether the construction should include the requirement that the microphones in the array are “positioned at predetermined locations.” R. 520, ClearOne Claim Const. Resp. at 26-27 (redacted); R. 535, Shure Claim Const. Reply at 11; Claim Const. Hrg. Tr. at 49:2-50:18. The Court will discuss each disagreement in turn.

¹⁰ClearOne’s complete proposal in its claim construction briefing is: “multiple microphones coupled together and positioned at predetermined locations that are used with a digital signal processing (“DSP”) algorithm to form a directional pickup pattern, and related hardware capable of using a DSP algorithm to form a directional pickup pattern.” R. 520, ClearOne Claim Const. Resp. at 22 (redacted).

a. Digital Signal Processing Hardware

On the issue of the “related hardware,” ClearOne essentially argues that the BFMA cannot *be* “beamforming” without a digital signal processor to *do* the beamforming. *See* R. 440, ClearOne Reply at 5 (“Shure proposes a construction ... which effectively strips the word ‘beamforming’ out of this claim term.”) (redacted); Claim Const. Hrg. Tr. at 54:3-5 (“The term ‘beamforming’ is used in this claim over and over again. Shure’s claim construction would mean that word just disappeared to no end.”). Shure responds by pointing to language in the specification that suggests that a “beamforming microphone” should be construed “in the context of its broadest definition” and that references to the BFMA in the patent refer to “any and/or all devices capable of performing respective operations in the applicable context.” R. 402, Shure Resp. at 12 (quoting ’806 Patent Col. 4:12-13, 4:25-29) (redacted); R. 407, LeBlanc Dec. ¶ 25 (“While a digital signal processing algorithm might be used to [perform the operations of the ’806 Patent], it is not the only ‘device capable of’ doing so, and should not be read into the claims as a requirement.”); Claim Const. Hrg. Tr. at 48:9-11 (“Shure’s construction allows for the communication device to be located remotely or also to be contained within the array, because the communication device is not part of the array.”).

Shure also argues that beamforming need not even involve digital signal processing. LeBlanc points out that “beamforming does not need to be complicated signal processing, two microphones mounted planar (horizontal) to the ceiling can be used in a broadside delay and sum array, and two microphones placed vertically can

be used in an endfire differential array (cardioid or other simple configuration).” R. 407, LeBlanc Decl. ¶ 22; *see also id.* ¶¶ 21-27 (“Any microphone inherently (e.g., physically) designed to have directional pickup pattern can be described as a beamforming microphone.”). Given that the patent requires a broad construction of beamforming, Shure argues, it would be inappropriate to read in a requirement of a digital signal processor or any other hardware at all.

Based on the text and context of the ’806 Patent, Shure’s construction of “beamforming microphone array” makes more sense than ClearOne’s. As noted above, modern applications of beamforming microphones generally rely on digital signal processing to form beams from audio input signals. But even if a person of ordinary skill would assume that the invention claimed in the ’806 Patent requires DSP to function, the patent itself does not teach that the DSP is *part* of the BFMA, that it must be in the same location, or even that they must be near each other.

Beginning in Column 4 of the ’806 Patent, Graham and the other inventors describe a “first environment,” pertaining to Fig. 1A. ’806 Patent Col. 4:35. According to the patent itself, that environment could involve “audio conferencing, video conferencing, etc.”—essentially, communication “between multiple users located within one or more substantially enclosed areas. *Id.* Col. 4:35-38. That is the embodiment relevant for this motion. The patent describes two different components relevant to how the communication between the different sets of users works: the “beamforming microphone array” (Array), and a “first communication device.” *Id.* Col. 5:9-12 (“The first environment 100 may also include a beamforming microphone array

116 (hereinafter referred to as Array 116) interfacing between the first set of users 104 and the first communication device 110 over the network 114.”). At this point, the patent describes the Array as including various microphones, possibly a “combination of beamforming microphones ... and non-beamforming microphones.” *Id.* Col. 5:17-19. Both sets of microphones, unsurprisingly, “capture [] audio input signals.” *Id.* Col. 5:20-23.

But in the environment described in Columns 4-6, the Array *itself* does not process those audio signals. Instead, the Array “may transmit the captured audio input signals to the first communication device 110 for processing and transmitting the processed, captured audio input signals to the second communication device 112.” ’806 Patent Col. 5:24-27. Not only that, the first communication device performs the beamforming: “In one embodiment, the first communication device 110 may be configured to perform augmented beamforming ... using a combination of the [beamforming microphones] and one or more [non-beamforming microphones].” *Id.* Col. 5:27-31; Col. 6:3-8 (“[T]he first communication device 110, which is configured to perform beamforming, may be implemented in hardware or a suitable combination of hardware and software, and may include one or more software systems operating on a digital signal processing platform.”).

The description above makes clear that the device performing the beamforming (the “first communication device”) is conceptually different from the BFMA. That alone is enough to establish that under the terms of the patent the hardware that applies the beamforming algorithm is distinct from the beamforming microphone

array itself. But the patent makes the case even clearer by implying that the “first communication device” could be in an entirely different location from the beamforming microphone array. The patent states that, “[i]n another embodiment, the functionality of the communication device 110 *may* be incorporated into Array 116.” ’806 Patent Col. 5:44-46 (emphasis added). Similarly, it later states that “[i]n some embodiments, the Array 116 *may* be integrated with the first communication device 110 to form a communication system.” *Id.* Col. 6:1-3 (emphasis added). This language implies that the communication device could be totally separate from the Array itself—they need not be incorporated or even located together.¹¹

The language in the patent describing the processor as distinct and possibly even distanced from the BFMA fits well with a few different references to digital signal processing in the parties’ testimony and exhibits. [REDACTED]

[REDACTED]

[REDACTED] R. 421, Patel Exh. 70, Braithwaite Dep. Tr. at 70:6-72:4 (sealed). Now that digital signal processing requires smaller

¹¹Of course, at the claim construction hearing, ClearOne argued that while some embodiments in the patent transmit audio signals to a separate communication device, some do not. Claim Const. Hearing Tr. at 53:4-21. Counsel for ClearOne argued, “So Shure complains that ClearOne’s claim construction reads out the embodiment in which audio signals are transmitted to another communication device, but ClearOne submits that Shure’s proposed construction reads out these other embodiments in which the functionality of the communication device is incorporated into the array.” *Id.* at 53:16-21. But that is not quite right. Shure’s construction does *not* require that the processing hardware be *included* with the BFMA, but it also does not require that the processing hardware be *excluded* from the apparatus entirely. Excluding the hardware from the definition of BFMA does *not* require it to be located in a separate location.

equipment that can be controlled remotely, it makes sense that processors are more frequently located near the beamforming microphone arrays that they receive inputs from. *See id.*; *see also* R. 409, Cerra Decl. ¶ 14. (“The need for a remotely-located separate processor box would have driven the cost of the product up significantly over today’s model.”) (redacted). But it was not long ago that processors *had* to be located at a distance from microphone arrays. *Id.* ¶ 14. (“[T]he required processors in 2006 would have generated enough heat to require a separate, remotely-positioned processor box”) (redacted). And there is no reason to suppose that the ’806 Patent assumes that the BFMA and DSP will be located in the same place. Even one of ClearOne’s experts, Paul Waadevig, stated—in the present tense—that “[d]igital signal processing, which includes acoustic echo cancellation, is done in specialized units, usually in a cabinet or otherwise not visible to the end user.” R. 362, Waadevig Rep. ¶ 27 (redacted).

At the claim construction stage, ClearOne also argued that that the Court should take a clue from the definition of “array system” in the ’524 provisional application. Claim Const. Hrg. Tr. at 54:20-55:4. The relevant excerpt from the provisional is this: “The system includes the following: a beamforming microphone array system; a beamforming array algorithm that uses the beamforming microphone array system; and a mounting method for the beamforming microphone array system.” R. 508-11, Claim Const. Exh. B-103, ’524 Provisional ¶ 11. ClearOne argues that because “array system” in the ’524 provisional includes “the algorithm,” the BFMA in the ’806 Patent must also include the hardware that implements whatever

algorithm is used to do the beamforming. Claim Const. Hrg. Tr. at 54:20-55:4 (“It makes clear that the beamforming microphone array system includes the beamforming microphone array and the algorithm that uses that array system ... So in the ’524 provisional, at least, it’s clear that the claimed system incorporates the algorithms and itself does the beamforming.”). But the language in the provisional is somewhat circular, because it says that the “system *includes* ... a ... system.” R. 508-11, Claim Const. Exh. B-103, ’524 Provisional ¶ 11 (emphasis added). Even setting aside that ambiguity, a “system”—which is what the ’524 provisional is describing—is not analogous to a “beamforming microphone array.” Indeed, it seems that the “beamforming microphone array” is just *part* of the “system.” The “algorithm,” in turn, is a separate part. If so, the definition of “system” from the ’524 provisional is simply further evidence that the algorithm need not be built into the array.¹²

Shure’s definition of BFMA recognizes that the processing—digital or otherwise—that accomplishes the beamforming itself need not take place next to or even near the microphones. According to the terms of the patent, as well as the realities of digital signal processing, the array and the processor are two different devices. So Shure’s construction of “beamforming microphone array” is the correct one on that issue.

¹²At the claim construction hearing, Shure made an additional argument that the array should include “a combination of beamforming microphones and non-beamforming microphones” and that “reading the definition of beamforming microphone into the array would be unduly limiting.” Claim Const. Hrg. Tr. at 44:24-45:4. This appears to be a continuation of Shure’s argument that the array itself should not be required to perform beamforming. But ClearOne does not appear to argue the opposite—that the array can *only* include beamforming microphones. And in any case, for the reasons already explained, it is clear that Shure’s definition, at least on the issue of the DSP hardware, is the correct one.

b. Predetermined Locations

The other dispute is whether the microphones in the BFMA are required to be at “predetermined locations.” R. 508, Shure Claim Const. Br. at 26-27; Claim Const. Hrg. Tr. at 49:22-50:18. Shure argues that including “predetermined locations” in the construction would improperly import a term from Claim 2 into Claim 1, making Claim 2 essentially meaningless. R. 508, Shure Claim Const. Br. at 26-27 (citing ’806 Patent at 13:31-33). In response ClearOne argues that using “predetermined locations” in the construction of BFMA would *not* render Claim 2 meaningless, because what Claim 2 really adds is not predetermined locations but instead that the microphones be located “on or in [the] ceiling tile,” as opposed to just above it. R. 520, ClearOne Claim Const. Resp. at 26-27 (“Claim 1—as construed by ClearOne—does not require that the microphones are ‘on or in’ the ceiling tile; the mics could be recessed further into the drop space beyond the ceiling tile.”) (redacted). ClearOne explains that the language stipulating that the microphones will be positioned at “predetermined locations” in the array is consistent with other language in the ’806 Patent that describes the microphones as “arranged in a specific pattern that facilitates maximum directional coverage,” Col. 11:21-23, or “selectively placed at known locations to design a set of desired audio pick-up patterns,” Col. 9:53-55. *See* R. 520, ClearOne Claim Const. Resp. at 26 (redacted).

ClearOne has the better argument. The language in support of ClearOne’s interpretation comes from the specification, reflects details about the BFMA found throughout the ’806 Patent, and is consistent with what a skilled artisan would

understand a microphone array to be. Because the language “positioned at predetermined locations” will likely assist the jury in understanding what the BFMA is and how it works, the Court includes it in its construction.

Ultimately, then, the Court uses most of Shure’s construction, leaving the digital signal processor *out* of the BFMA, but adding that the microphones in the array must be “positioned at predetermined locations.” The Court thus arrives at the following construction: a beamforming microphone array is “a plurality of microphones positioned at predetermined locations that produce audio signals to be used to form a directional pick up pattern.”

3. Drop Space

The ’806 Patent claims an invention that puts a beamforming microphone array in the ceiling. In a room with a dropped ceiling, the claimed ceiling tile fits into the drop ceiling grid, and at least some of the array is hidden behind the drop ceiling in what is called the “drop space.” The parties disagree on the meaning of “drop space.” Although the term is used throughout Claim 1 of the ’806 Patent, the parties’ dispute centers on its use in Limitation 5, which specifies that the “beamforming microphone array is coupled to the back side of said ceiling tile and all or part of said beamforming microphone array is in the *drop space* of the drop ceiling.” ’806 Patent Col. 13:27-30 (emphasis added).

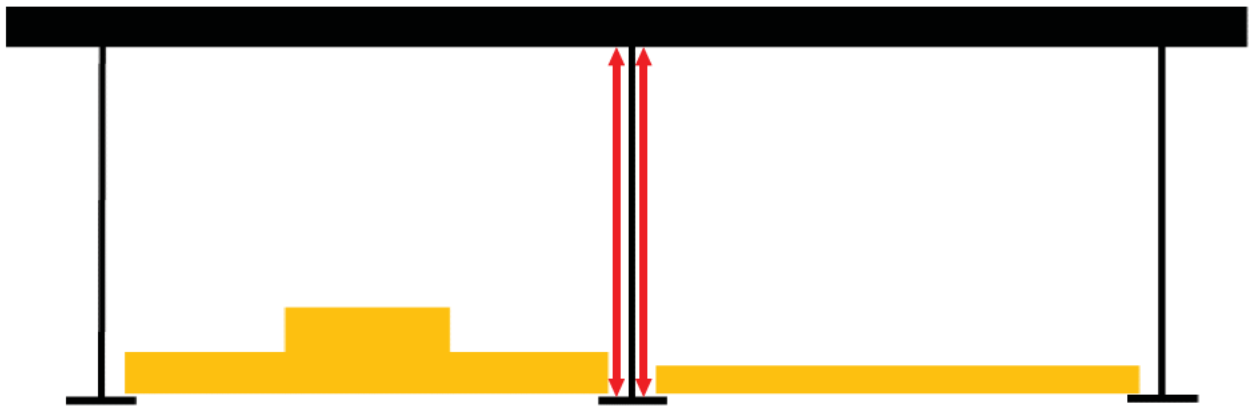
The parties’ disagreement on the proper construction of “drop space” comes down to whether the lower boundary of the space is at the back or top of the ceiling tiles that make up the ceiling, or whether it extends to the tiles’ lower surface—that

is, the surface facing down into the room. Shure’s proposed construction is that the drop space is “the space between the lower surface of the true ceiling of the room and the upper surface (back surface) of the drop ceiling tile.” R. 419-1, Claim Const. Chart. Shure argues that the ceiling tiles in a drop ceiling cannot be part of the drop space because the tiles themselves are not “space,” and because ceiling tiles are not conventionally understood to be part of the “plenum” (an industry term used to refer to the “open air space from the back surface of the ceiling tiles to the true ceiling above”).¹³ R. 402, Shure Resp. at 14 (redacted). Initially, ClearOne’s proposed construction was that the drop space is “the space between the surface of the structural ceiling of the room and the lower surface of a suspended ceiling tile.” R. 419, Claim Const. Chart. In other words, ClearOne believed the drop space should “include[] the space in which a drop ceiling tile rests.” R. 440, ClearOne Reply at 7 (redacted). At the claim construction hearing, ClearOne revised its construction slightly to: “the space between the surface of the structural ceiling of the room and a plane defined by the support beams for the drop ceiling.” Claim Const. Hrg. Tr. at 74:13-16; *see also* R. 520, ClearOne Claim Const. Resp. at 29 (“Put another way, a

¹³Both parties referenced the “plenum” in their arguments about the drop ceiling. ClearOne argued, for example, that the fact the MXA910 is plenum rated suggests it must be in the drop space. Prelim. Inj. Hrg. Tr. at 25:2-5 (“[H]ere’s a document that’s describing the MXA910 product, and it talks about it being plenum rated, and it says it has this FyreWrap protection, and it clearly it’s talking about it being in the plenum space”). Shure, on the other hand, argued that “drop space” must be the same as the plenum space, and thus have the same definition. *Id.* at 49:8-50:22. The Court did not find arguments about the plenum to be particularly persuasive, given that Shure seems to acknowledge that the term “plenum” is related to ventilation and fire regulations and is not necessarily used in the same context as the ’806 Patent. *See, e.g., id.* at 64:24-65:4 (“It’s only when you take an electrical device and you’re putting it up into the plenum space, the air space, such that it is—has exposure to the air, then it has to be rated as plenum rated.”).

‘drop ceiling’ should be defined by a ‘plane,’ even when the ceiling tiles have not yet been placed onto the support beams. The ceiling tiles are paced *into* the drop space formed by the support beams; they do not themselves define it.”) (redacted).

Based on the text and the context of the ’806 Patent, ClearOne’s revised construction is correct for the reasons detailed below. For the purposes of this litigation, the Court construes the drop space as the space between the structural ceiling of the room and the plane defined by the drop-ceiling support beams. In a drop ceiling supported by a T-bar ceiling support grid, the drop space will end at the plane of the horizontal bars used in the grid—specifically, in the figure below (originally provided by ClearOne in its preliminary injunction slides), the horizontal lines on which the tiles rest:



The T-bar configuration, which Shure conceded is the typical ceiling configuration in conference rooms using the MXA910, Prelim. Inj. Hrg. Tr. at 47:13-23, helps explain what is understood to be the “drop space” in a room *before* the ceiling tiles are dropped in. A person of ordinary skill in the art would assume that the drop

space is all the space above the horizontal T-bar grid. The lower plane of the drop space does not then change simply because ceiling tiles are placed in it. Shure is, of course, correct that ceiling tiles are not themselves “space.” See R. 402, Shure Resp. at 14 (“This construction is nonsensical, because the material of the ceiling tiles is not ‘space.’”) (redacted). But that is not the point: the ceiling tiles are *in* the drop space.

This is clear in the figure above: the yellow components of the image are the tiles themselves; the black bar along the top represents the structural ceiling; the vertical black lines represent the vertical bars of the suspended ceiling; and the short, horizontal black lines at the bottom are the horizontal part of the grid, on which the tiles rest. In the figure, the drop space is not defined by the ceiling tiles but by the T-bar structure on which they rest. The bottom of the structure is the lower boundary of the space.¹⁴

One potential problem with ClearOne’s construction of “drop space” is whether it jibes with the language in Limitation 5 requiring “all or part” of the array to be in the drop space. Under ClearOne’s construction, it is easy to envision what it would look like for *all* of an array to be in the drop space—anything integrated with the ceiling tile that does not extend below it would be within the drop space. But it is more difficult to envision how only *part* of the array would be in the drop space. Under Shure’s construction, the possibility of only “part” of the array existing in the drop

¹⁴As a side note, ClearOne argues that the drop space must extend to the bottom of the tiles because there is air between the tiles, presumably touching the sides of the tiles themselves. R. 440, ClearOne Reply at 7 (redacted); Prelim. Inj. Hrg. Tr. at 18:17-19:11. That argument is not convincing—*where* air can be found is not a useful limiting principle for the drop space, because air could be found in any small nook or cranny.

space is more obvious—the part of the array that is within the ceiling tile (or below its back surface) would not be in the drop space, while any part extending above the back surface of the tile would be. Shure pointed this out in the preliminary injunction hearing. Prelim. Inj. Hrg. Tr. at 47:5-7 (“[I]f the lower surface of the ceiling tile is the boundary, wouldn’t the beamforming array always be all in the drop space?”).

In grappling with this issue, at the preliminary injunction hearing, the Court asked one of the inventors of the ’806 Patent, Derek Graham, “what would be an example of a situation where the array would be just in part of the drop space?” Prelim. Inj. Hrg. Tr. at 90:1-3. Graham responded that it could be possible for the “front surface, the acoustically transparent outer surface” to be “lowered somewhat to allow the microphones to be dropped down a little bit into the room.” *Id.* at 90:7-10. Graham testified that the integrated array-and-ceiling tile in that scenario would either be lower than the other tiles in the room, or “lower than just the support grid.” *Id.* at 90:11-15. Under ClearOne’s proposed construction of “drop space” it is uncertain how the microphones would be only partly in the drop space if *all* the tiles in the room were lowered slightly below the support grid, and the microphones were above them. But the possibility remains that the tile practicing the patent could be lower than the *rest* of the tiles in the room, in which case microphones directly above that tile could be only partly in the drop space. And that possibility might still be aesthetically superior to the current BMA-1 ceiling mount. ClearOne reiterated that point at the claim construction hearing by presenting a slide that illustrated how a

product practicing the patent could have a lower surface *below* the plane of the drop ceiling but still leave room for part of the array to be located above that plane:



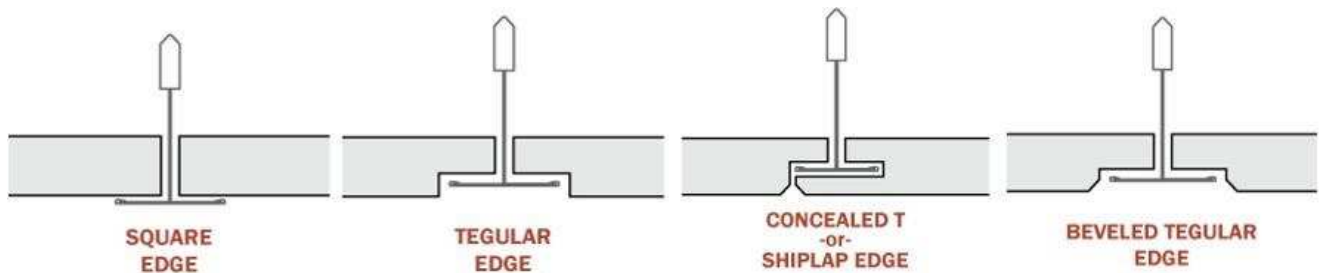
See also Claim Const. Hrg. Tr. at 72:19-73:4. In the image above, the middle tile is integrated with a BFMA, which could be located partially below the plane of the ceiling and partially above it—that is, partially in the drop space.

In response to this, Shure argues that a definition that allows a product that descends into the room (as in the image above) would create an invalidity problem, so the definition must be wrong. *See* Claim Const. Hrg. Tr. at 67:4-18. But Shure’s argument is not quite right—at least not with regard to Chhetri as prior art (Chhetri is discussed further below). Here is why: a BFMA that is not in the drop space at all—and is instead located *totally* beneath it, like Chhetri—would not practice Limitation 5 of Claim 1 of the ’806 Patent, and thus would not be covered by the patent. But ClearOne’s construction does not require that here—the example image above shows a BFMA that is both *in and below* the drop space. So even under ClearOne’s construction, it is still plausible that Limitation 5 was added in response to the

Examiner’s concern about the Chhetri patent, exactly as Shure has argued. *See* R. 402, Shure Resp. at 8 (redacted). And ClearOne’s construction does not interfere with that balance at all: Limitation 5 (by Shure’s argument) vitally differentiates the ’806 Patent from Chhetri. Of course, a product like the middle tile in the image might face a different set of invalidity challenges than a version of the product that lines up perfectly with all the other tiles in the room, and perhaps Shure will present some arguments to that effect at the summary judgment stage. But at the very least, it is safe to say that the image provided by ClearOne shows a BFMA unlike Chhetri both in that it is (1) partly in the drop space, not dangling totally into the room, and (2) *integrated with* a ceiling tile—not just hanging from it.

Relatedly, ClearOne’s construction is also a better fit with the context of the ’806 Patent. If the goal of the patent was to get microphones mostly out of sight of the people in the room, it does not matter whether they are located above the *top* side of a drop ceiling tile—as long as they are above the bottom of it—despite Shure’s protestations to the contrary. *See* Claim Const. Hrg. Tr. at 68:6-12.

Three other arguments raised by Shure at the claim construction phase are worth addressing. First, Shure points out that not all drop ceiling tiles sit in drop ceiling support grids quite the same way, using this image to illustrate the point:



See Claim Const. Hrg. Tr. at 69:6-12. Shure argues that because of this diversity of beam-and-tile configurations, relying on the beam to define the drop space creates confusion. *Id.* But it is not clear why that would be, because it does not appear to matter to any of the litigated issues exactly *how* the tile sits in the beam. A BFMA integrated with any of the tiles shown above could sit either totally or partly in the drop space. It is true that in the case of a tegular, shiplap, or beveled tegular edge, the starting point of the drop space depends on how the term is interpreted. But there is nothing wrong with that (and it is true for the square edge model, too)—if anything, the diversity of tiles actually makes it more sensible to define “drop space” by referring to support beams that, by physical necessity, are always part of a drop ceiling.

Second, Shure has argued that the support beams should not be used as a reference point in defining the drop space because the support grid itself does not create the ceiling. Claim Const. Hrg. Tr. at 69:22-70:2 (“And this notion that the grid or the support beam in any way should be considered the drop space doesn’t make sense. Without the ceiling tiles, the grid just creates openings of infinite space. It doesn’t create any type of a boundary.”). But of course, no one is arguing that support beams create a ceiling all by themselves if there are no ceiling tiles installed on them. What the beams do is create the boundary of the drop *space*, which after all, is just space—not the ceiling. Shure’s argument relies on the fallacy of singling out one piece of the overall system and then challenging it as non-sensical when divorced from all

of the other pieces. Protesting that the beams do not create a ceiling without tiles is just as wrong as pointing to a ceiling tile that is not installed, just lying on the floor, and saying, “That’s not a ceiling tile, it’s a floor tile.”

Third, at the claim construction hearing, Shure encouraged the Court to think about the ceiling as the equivalent of a wall (albeit a horizontal one) between two rooms. Claim Const. Hrg. Tr. at 70:11-20 (“[I]f a skilled artisan wanted two rooms ... and wanted to put a partition in the middle ... [t]hat thickness of the partition should not be attributed to either room.”). But a drop ceiling is not a wall, and drop space is not a room. As ClearOne points out, the drop space consists of “space”—it need not all be “useful space.” *Id.* at 71:4-6; *see also id.* at 70:15-17 (Shure arguing that the wall thickness “should not be attributed to either room, because it does not provide any useful space.”). Regardless of the thickness of the tiles used in a drop space, they are *in* the space—they do not define it.

4. Ceiling Tile

Both Shure and ClearOne agree that “ceiling tile” should have its plain and ordinary meaning. R. 402, Shure Resp. at 11 (redacted); R. 440, ClearOne Reply at 4-5 (redacted). The Court agrees. The Court also notes that the plain and ordinary meaning of the term “ceiling tile” is not limited in terms of the material from which the tile is made. Shure argues that the tile must denote a “standard” ceiling tile, R. 402, Shure Resp. at 11 (redacted), “made from a mineral fiber or other material[with] a high noise reduction coefficient,” R. 406, Roy Decl. ¶ 42. But even Shure’s expert, Kenneth Roy, acknowledges that “[c]eiling tile[s] come in a variety of textures

and designs,” *id.*, and the ’806 Patent does not limit the definition of “ceiling tile” further. The one exception, of course, is Claim 4 of the patent, which requires that the ceiling tile “comprise[] acoustic or vibration damping material.” ’806 Patent Col. 13:38-39. Ultimately, though, Claim 1 does *not* require a specific type of material.

B. Infringement

With claim construction in place, the next question is infringement. In order to show entitlement to a preliminary injunction, ClearOne must demonstrate that it will likely be able to prove that Shure is infringing the ’806 Patent. *Amazon.com*, 239 F.3d at 1350. Shure argues that ClearOne cannot do so because the MXA910 does not practice all the limitations of Claims 1, 4, 5, and 6. ClearOne (of course) contends that it does.

1. Whether the MXA910 is Integrated with a Ceiling Tile

Shure argues that the MXA910 does not practice Claim 1 of the ’806 Patent because although the MXA910 “may be mounted to *replace* a ceiling tile, it is not *integrated into* a ceiling tile.” R. 402, Shure Resp. at 16 (redacted). To counter Shure’s argument, ClearOne and its expert both point to internal Shure documents that refer to the MXA910 as a “ceiling tile” or as somehow capable of being integrated into a ceiling tile configuration. R. 439, ClearOne Reply at 9 (sealed); R. 372, Schonfeld Decl. at 8-9 (redacted); *see, e.g.*, R. 370-1, Giza Exh. 18 at 69 [REDACTED] (sealed); R. 370-13, Giza Exh. 120 at 1 [REDACTED] (sealed).

Shure’s argument here is unconvincing: the MXA910 is indeed a beamforming microphone array integrated with a ceiling tile. The fact that it may not look like every other ceiling tile in a given room does not matter. The bottom line is that it fits the plain meaning of a “ceiling tile,” that is, a tile that forms part of the boundary between the drop space and the rest of the room.

At the preliminary injunction hearing, Shure argued that ClearOne’s allegations of *how* the MXA910 was integrated with a ceiling tile had changed over time. Prelim. Inj. Hrg. Tr. at 58:25-59:6 (“ClearOne’s late-filed newest argument as of just last week is that the MXA910 includes a metal ceiling tile with an acoustically transparent grille pattern. ... This was the first time this was introduced. Until now they have referred to the entire device[.]”); *id.* at 61:19-22 (“[P]art of our contention has been you can’t say, you have to tell us what is the ceiling tile because from that, we can define some other things, right, that are claim limitations.”). But Shure misses the point. The MXA910 is a BFMA in the form of a ceiling tile—ClearOne does not have to point to one particular component of the MXA910 as the ceiling tile, distinct and separate from the beamforming microphone array. That is the point of the invention: they are *integrated* together.

On a similar note, at the claim construction stage, Shure also argued that the relevant language from Claim 1 (“said beamforming microphone array integrated into said ceiling tile as a single unit,” ’806 Patent Col. 13:20-21, should be construed as “two separate structures (a beamforming microphone array and a ceiling tile) combined together to form a single unit.” R. 508, Shure Claim Const. Br. at 27-29;

Claim Const. Hrg. Tr. at 57:5-64:9. This argument—which mirrors Shure’s infringement argument about the supposed lack of integration—hinges on interpreting the claim language to mean that the apparatus must start with both a standalone ceiling tile and a standalone BFMA, and then fastening them together through some mechanical means. R. 508, Shure Claim Const. Br. at 27-29. In support of that argument, Shure says, the patent uses the word “combining” several times to describe the types of features of a room that could be combined with a BFMA. *See id.* at 27-28 (citing ’806 Patent Cols. 6:41-60, 6:61-8:24, 8:25-10:8, 10:9-11:15 (describing a combination of a BFMA with a spanner post, lighting fixtures, ceiling tile, and wall panel)). The idea is that in order to “combine” or “integrate” a BFMA with something else, the two items must start out as a separate structures. R. 508, Shure Claim Const. Br. at 28 (“Such combinations necessarily require two structures brought together.”). Shure also points to intrinsic evidence that the process of combining the ceiling tile with the BFMA was meant to be mechanical—involving “hooks” or “fasteners.” *See id.* (citing ’806 Patent Col. 9:5-25 (“The reverse side 270 of the ceiling tile 264 may include hooks ... for securing the Array 116 to the ceiling tile 264.”)); Claim Const. Hrg. Tr. at 59:12-15.

But Claim 1 speaks for itself. Its plain and ordinary language requires that “a beamforming microphone array [be] integrated into [a] ceiling tile as a *single unit*,” ’806 Patent Col. 8:20-21 (emphasis added), and that is readily understandable to a skilled artisan that the BFMA and the ceiling tile together form a single unit. The plain and ordinary language does not set limits on *how* the “single unit” must be

created—or how the integration between the ceiling tile and the BFMA must be achieved. And that is not a problem, because Claim 1 is *not* a *method* of manufacturing claim. *See* R. 508, Shure Claim Const. Br. at 15 (acknowledging that Claim 15 is a “method-of-manufacture” claim, but never arguing that Claim 1 should be understood that way). Also, as ClearOne points out, while the patent does discuss embodiments created by combining two separate structures, *see* ’806 Patent Col. 8:58-63 (“In one embodiment, the ceiling tile 264 may include a geometrical socket ... having an appropriate dimension to substantially receive the Array 116, which integrates the tile and the Array as a standalone unit.”), it explicitly states that the process can happen “in a variety of ways,” *id.* Col. 8:58-59; *see also* Claim Const. Hrg. Tr. at 63:8-64:7. Another way to do it, according to the patent, is by “integrat[ing] [] the ceiling tile 264 [with the Array 116] as a single unit.” ’806 Patent Col. 9:26-27.

It is true, as Shure argues, that in the first embodiment (Column 8:58-63) there could be a concern about “damage to the ceiling tile 264 due to the load or weight of the Array 116.” ’806 Patent Col. 9:27-29; R. 535, Shure Claim Const. Reply at 12; Claim Const. Hrg. Tr. at 61:3-10 (“You’re only worried about damage on the one object due to the other object when you are, in fact, combining two separate objects.”). But according to the language of the patent itself, one of the reasons to choose the second embodiment—in which the tile and BFMA are integrated into a single unit instead of one structure receiving the other as described in the first embodiment (Col. 8:58-63)—is that “[s]uch [integrated] construction of the unit may be configured to *prevent* any damage.” ’806 Patent Col. 9:27-29 (emphasis added). So Shure’s argument for

reading the two embodiments together actually points in the other direction—the second, integrated embodiment ('806 Patent Col. 9:26-27) is an alternative to the first, separate-structures embodiment ('806 Patent Col. 8:58-63)—an alternative that might alleviate at least one potential issue with using two separate structures as the starting point for manufacturing.

All that said, the point remains that Claim 1 is not a method of manufacturing claim, so it does not set limits on exactly *how* the ceiling tile and BFMA must be integrated, much less require that they start as two separate structures. The Court will rely on the plain and ordinary meaning of this language, which the MXA910 clearly practices.

2. Whether the MXA910 Includes Microphones in the Drop Space

Shure argues that no part of the MXA910 is in the drop space of the drop ceiling, as claimed by the '806 Patent at Claim 1, Limitation 5. R. 402, Shure Resp. at 17-18 (redacted). Because the lower boundary of the drop space is the plane defined by the support beams for the drop ceiling (see above), any MXA910 mounted in the drop ceiling grid practices Limitation 5 of Claim 1.

3. Whether the MXA910 Includes Acoustic or Vibration Damping Material

Finally, Claim 4 of the '806 Patent teaches the invention according to Claim 1, “wherein said ceiling tile comprises acoustic or vibration damping material.” Shure argues that the MXA910 does not practice Claim 4, because it does not “include[] the required acoustic vibration or damping material.” R. 402, Shure Resp. at 19 (redacted). ClearOne responds by pointing to seven “vibration damping pads” inside the MXA910, referred to in the preliminary injunction hearing as “poron

marshmallows.” R. 440, ClearOne Reply at 9 (redacted); Prelim. Inj. Hrg. Tr. at 26:23-28:14. ClearOne’s expert Schonfeld points to the pads circled in red on the figure below and identifies them as “vibration damping pads.” R. 372, Schonfeld Decl. ¶ 49 (redacted).



ClearOne also points to an internal Shure email [REDACTED]

[REDACTED]

[REDACTED] R. 389-1, Giza Exh. 132 at 5 (sealed); R. 439, ClearOne Reply at 9 (sealed).

Shure contests the function of the gray pads pictured above. David Cerra, Shure’s Associate Vice President of Engineering for Conferencing and Audio Processing, stated in his declaration that [REDACTED]

R. 417, Cerra Decl. ¶ 13 (sealed). Instead, he claims, [REDACTED]

[REDACTED] *Id.* (sealed). Cerra

also contends that [REDACTED]

[REDACTED] According to Cerra, [REDACTED]

[REDACTED]

[REDACTED] R. 417, Cerra Decl. ¶ 13 (sealed). The MEMS microphones used in the MXA910, because they are “poor mechanical transducers,” turned out not to require “mechanical isolation.” R. 409, Cerra Decl. ¶ 13 (redacted). Cerra’s account maps onto at least one Shure internal slideshow document that states [REDACTED]

[REDACTED]

[REDACTED] R. 370-10, Giza Exh. 110 at 3 (sealed). But the presentation continues: [REDACTED]

[REDACTED]

[REDACTED] *Id.* (sealed). [REDACTED]

[REDACTED]

[REDACTED]

In the end, Cerra never averred that the seven pads identified by Schonfeld are not foam pads, and there is no evidence that they were removed before production—in fact they could not have been (at least not universally), because ClearOne obtained this version of the MXA910 by purchasing it. All of the circumstantial evidence shows that the pads within the red circles identified by Schonfeld are made of foam or some other vibration-damping material. Whether or not they are necessary for acoustic dampening, or whether Shure placed them on the

board for that purpose, is irrelevant. If the material dampens, as this does, then it practices Claim 4.

C. Validity

Next up is the question of the '806 Patent's validity. This is a crucial question. Under 35 U.S.C. § 282 an issued patent "shall be presumed valid." 35 U.S.C. § 282. But if Shure can demonstrate a "substantial question" of the patent's validity, then the preliminary injunction cannot issue. *Amazon*, 239 F.3d at 1350-51. A substantial question exists if the challenger raises an invalidity defense that the patentee cannot prove lacks substantial merit. *Id.* (citing *Genentech*, 108 F.3d at 1364). The Court will address each of Shure's major invalidity arguments.

1. Anticipation

Shure argues that an audio conferencing system produced by the Conference Technology Group, LLC (CTG) anticipated the invention claimed in the '806 Patent. The parties refer to the system as the "CTG System," and the Court will do so too. A "single prior art reference" anticipates a patent, making it invalid, if it "discloses each and every limitation of the claimed invention." *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003). Shure argues that the CTG System includes a BFMA, a BFMA integrated into a ceiling tile as a single unit, and "at least a portion of the BFMA in the drop space." R. 402, Shure Resp. at 20 (redacted).

ClearOne offers several arguments in response. First, ClearOne argues that the CTG System includes [REDACTED]

[REDACTED] R. 366, Mot. Prelim. Inj. '806 Patent at 12 (sealed). Second, ClearOne

argues that [REDACTED] such that they cannot be part of a BFMA as required by the '806 Patent. *Id.* (sealed). Relatedly, ClearOne argues that the CTG System does not actually perform beamforming at all. *Id.* at 12-13 (sealed).

On review of the evidence, the Court concludes that the CTG System does not anticipate the '806 Patent. First, the CTG System is not an array. Shure argues that “having more than one CM-01 on a ceiling tile forms a BFMA integrated into the ceiling tile as a single unit.” R. 402, Shure Resp. at 20 (redacted). But there is no evidence that more than one CM-01 has ever been used on a ceiling tile. CTG’s CM-01 is *one* microphone, and while Shure argues that consumers *could* combine several of the CTG microphones together, Prelim. Inj. Hrg. Tr. at 95:16-21, ClearOne points out that there is no evidence anyone has ever done that—much less in the space of a single ceiling tile, R. 440, ClearOne Reply at 10 (redacted). And it is not clear *why* a consumer would do that. In fact, CTG advertised that the system could “[p]rovide[] even pick up for the maximum number of participants with the minimum number of microphones,” R. 405-5, Newman Decl. Exh. E at 1 (redacted), and that each “CTG microphone has a pickup range with a radius of up to 10 feet or more,” R. 405-6, Newman Decl. Exh. F at 9 (redacted).

Second, the CTG System is not “integrated with a ceiling tile,” as required to practice Claim 1 of the '806 Patent. Instead, it is installed by drilling a hole in an existing tile and “[p]ushing [the] microphone barrel ... through [the] hole in [the] tile until [its] lip stops against [the] tile.” R. 405-9, Newman Decl. Exh. I (redacted). It is

then secured atop the tile with a friction clip. *Id.* (redacted). The product is not a ceiling tile combined with a beamforming microphone array but simply a microphone that can be inserted into a ceiling tile. Shure’s anticipation theory fails.¹⁵

2. Obviousness

Under 35 U.S.C. § 103, a proposed patent must not be granted if the claimed invention would have been obvious before the filing date to a person of ordinary skill in the art. To evaluate obviousness, courts consider the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the art, as well as secondary considerations like commercial success, long-felt need, and the failure of others to arrive at the invention. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417-18 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

Shure divides its prior art references into two categories. The first is “[r]eferences that disclose beamforming microphone arrays integrated with a ceiling.” R. 399-1, Shure Am. Final Inv. Content. at 8. And the second is “[r]eferences that replace a ceiling tile in a drop ceiling with sound collection equipment.” *Id.* at 14.

¹⁵On ClearOne’s argument that the CTG System does not performing beamforming, ClearOne points primarily to an admission from Joseph Marash, an employee of the company that created the processor for the CTG System: [REDACTED] R. 370-8, Giza Exh. 94 (sealed); see also R. 368, Schonfeld Decl. ¶¶ 57-58 (explaining that the CTG System’s mixers “do not perform a beamforming algorithm to form a directional pickup pattern using multiple microphone inputs”) (sealed). Naturally, Shure disagrees, pointing primarily to testimony from LeBlanc that the simple mixing performed by the CTG System satisfies the “broad” definition of beamforming disclosed in the ‘806 Patent. See R. 402, Shure Resp. at 21 (citing R. 407, LeBlanc Decl. ¶¶ 30-36) (redacted). The Court does not need to reach this question given how clear it is that the CTG System is not an array and is not integrated with a ceiling tile.

Shure advocates a sort of mix-and-match approach. By pairing a reference from the first category with a reference from the second category, Shure argues, a person skilled in the art could create a product that practices all the representative claims of the '806 Patent. *Id.* at 22. These combinations would then make the '806 Patent obvious. *Id.*

In determining whether Shure's proposed combinations render the '806 Patent invalid, the Court must examine whether it would have occurred to a skilled artisan to combine the elements of these prior art references with one another in the first place. *ActiveNetworks, Inc. v. Verizon Comms., Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) ("To invalidate a patent claim based on obviousness, a challenger must demonstrate by clear and convincing evidence that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.") (cleaned up); *KSR, Int'l*, 550 U.S. at 418 ("[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. ... [I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed invention does."). In doing so, the Court must be careful to "guard against slipping into use of hindsight" and the "temptation to read into the prior art the teachings of the invention in issue." *Graham*, 383 U.S. at 36 (cleaned up). The Supreme Court has warned, however, that identifying a motivation for a skilled artisan to combine elements of prior art should

not require a rigid test, and a qualifying motivation can be provided by “design incentives or other market forces,” *KSR, Int’l*, 550 U.S. at 417-19. Often whether a combination is obvious will come down to whether it “yield[s] predictable results.” *Id.* at 416.

None of Shure’s proposed combinations make the ’806 Patent obvious. All of Shure’s proposed combinations involve combining a microphone with a loudspeaker located in a ceiling tile. Shure’s combinations feature three different loudspeaker devices: IPSCM Ceiling Tile IP Speaker produced by Advanced Network Devices (AND), the I128SYSM IP Compliant Loudspeaker with Microphone produced by Atlas, and the I-Ceilings tile developed by Armstrong. *See* R. 403, Donahoe Decl. (describing the IPSCM Ceiling Tile IP Speaker) (redacted); R. 402, Marlin Decl. (describing the I128SYSM IP Compliant Loudspeaker with Microphone) (redacted); R. 406, Roy Decl. ¶¶ 119-20 (describing the I-Ceilings device). Shure argues that the loudspeaker devices “provide[] concealment, ease of installation, and maximization of room space.” R. 402, Shure Resp. at 24 (redacted). The idea is that adding a BFMA to a loudspeaker that is integrated into a ceiling tile would reap the same aesthetic rewards of the ’806 Patent and practice all its claims.

It is not at all clear that a skilled artisan would have been motivated to combine any of the loudspeaker prior art references with a BFMA. ClearOne argues that the objectives of loudspeakers are different than those of audio conferencing microphone arrays, and explains that while “an ideal loudspeaker would transmit sound equally well to everyone in the room ... (less directional) ... an ideal microphone

would pick up only the active talker and ignore others so that only the active talker is heard (more directional).” R. 369, Mot. Prelim. Inj. ’806 Patent at 17-18 (redacted); R. 372, Schonfeld Decl. ¶¶ 87-89 (redacted). The Court agrees: given the differences in the applications of the two types of devices, a person of ordinary skill might very well not have thought to combine them. Shure points out that that the IPSCM, Atlas, and I-Ceilings devices all include microphones or have the capability to receive audio signals. R. 403, Donahoe Decl. ¶ 3 (explaining that the IPSCM product “features a built-in microphone and speaker that allow for two-way communications”) (redacted); R. 402, Marlin Decl. ¶ 7-8 (explaining that the Atlas product “includes a single omnidirectional electret condenser microphone ... [that] allows for two-way communication with any PC or IP phone.”) (redacted); R. 406, Roy Decl. ¶ 120 (“While the I-ceiling speaker is marketed primarily as a loudspeaker, it is also advertised in its brochures, and in US Patents, as useful for direct use in a ‘Talk Back’ enabled DSP system as a microphone.”); *see also* R. 402, Shure Resp. at 23-24 (redacted); *but see* R. 372, Schonfeld Decl. ¶ 68 (disputing whether I-Ceilings is or has a microphone) (redacted). But Shure never argues that the products have particularly high audio quality, or that the microphones are anything more than an attractive add-on to inventions that are mainly used for *hearing* information—not delivering it back. There is no suggestion that the loudspeaker/microphone combinations are similar in design or use to the type of products commonly used in audio conferencing settings.

And even if—given the superior aesthetics of the existing loudspeakers—a skilled artisan would have had a motivation to combine them with a BFMA, there is

no reason to believe that the skilled artisan would have had any expectation of success. As discussed above, the context for the '806 Patent was a world in which conferencing microphones usually were not installed in the ceiling. *See* R. 440, ClearOne Reply at 13 (redacted). Inventors and integrators believed that placing microphones as close as possible to the talker was necessary for the type of audio quality the market demanded. R. 360, Graham Decl. ¶ 8; R. 367-1, Giza Exh. 22 at 1; R. 372, Schonfeld Decl. ¶ 26 (redacted). And Graham explained that his team was surprised by the quality of audio they were able to create in their first tests. *See* Prelim. Inj. Hrg. Tr. at 76:1-9 (Graham testifying that the “actual test results indicated that the beamforming microphone array actually sounded better than the traditional ceiling microphones that were used at the time.”); R. 370, Giza Exh. 10 (sealed); R. 360, Graham Decl. ¶ 9. Against this evidence, Shure has failed to show that the results of ClearOne’s tests should have been predictable.

Of course, Shure argues that the audio quality of its proposed combinations is irrelevant, because the '806 Patent does not require a certain level of quality. R. 402, Shure Resp. at 27 (“The claims are silent as to quality or conferencing, and could be just as easily practiced by a lower quality voice recognition system for use in a residential application as they could by a professional conferencing system.”) (redacted). But the context of the '806 Patent is illuminating here, as is the fact that according to its own terms the patent is responding to the traditional method of configuring beamforming microphone arrays. '806 Patent Col. 1:51-54. ClearOne has produced significant evidence that the traditional method of installing beamforming

microphones—that is, installing them somewhere in the room *below* the drop ceiling (like on the conference tables)—prevailed for so long precisely because of concerns about quality. *See* R. 360, Graham Decl. ¶ 8; R. 367-1, Giza Exh. 22 at 1; R. 372, Schonfeld Decl. ¶ 26 (redacted). In context, the '806 Patent is responding to the problem of the competing needs for attractive aesthetics and high audio quality in the installed audio conferencing market. The motivations of a skilled artisan working in that market and responding to those market pressures would obviously take audio quality into account. So Shure's arguments that quality should not be taken into account at all in the obviousness analysis is unpersuasive.

Rejecting combinations that require combining microphone arrays with loudspeakers knocks out all of Shure's possible combinations: IPSCM plus Sasaki, IPSCM plus Soda, Atlas plus Chhetri, IPSCM plus the BMA-1, IPSCM plus Miki, IPSCM plus Chhetri, and I-Ceilings plus Chhetri. There are other reasons why many of these combinations fail to make the '806 Patent obvious. For example, many of the devices would be quite difficult to combine. Chhetri's proposed array seems to be larger than what would easily map onto a two-foot by two-foot ceiling tile such that attempting to simply combine it with ceiling tile loudspeaker art would involve changing it substantially. *See* R. 440, ClearOne Reply at 13-14 (redacted). Miki is similar: it discloses locating microphones all around a room—not in one location behind one tile. R. 412-1, Patel Exh. 13, Claim 1 (disclosing “[m]ultiple sound-collection devices dispersed over a ceiling or a wall so as to collect sound within the respective prescribed areas.”). Combining Miki with a loudspeaker ceiling tile would

seem to involve distorting it beyond recognition. And some of the combinations might be even less obvious because the microphones involved were developed for entirely different purposes. Chhetri was developed for use in an augmented reality system, for example. R. 372, Schonfeld Decl. ¶ 80 (redacted). Soda and Sasaki are both intended for use in home voice-command systems. *Id.* ¶¶ 78, 81-85 (redacted).

ClearOne next points to the secondary considerations of the obviousness inquiry, which include commercial success, long-felt but unsolved need, and the failure of others to arrive at the invention. *KSR, Int'l*, 550 U.S. at 399. Secondary considerations are only a part of the analysis, but here they generally weigh against finding a substantial question of the '806 Patent's validity. Again, ClearOne has pointed to a long-felt need for more remote and aesthetically discreet audio conferencing microphones. *See* R. 362, Waadevig Rep. ¶ 31 (“[E]nd users have long sought microphones that are remote from conference participants and functionally invisible to them. But because microphones are notorious for producing lower quality audio when placed farther away, vendors in the installed audio conferencing market have long struggled to meet this demand.”) (redacted); *see also* R. 360, Graham Decl. ¶ 8; R. 367-1, Giza Exh. 22 at 1; R. 372, Schonfeld Decl. ¶ 26 (redacted). And it is indisputable that Shure's MXA910 has enjoyed commercial success, likely at least in part because of its infringing features—an issue the Court will address further below. *See* R. 439, ClearOne Reply at 18 (sealed).

For all these reasons, Shure has failed to raise a substantial question of the '806 Patent's non-obviousness.

3. Arguments under 35 U.S.C. § 112

At the preliminary injunction stage, Shure makes three primary arguments that the '806 Patent is invalid under 35 U.S.C. § 112 because the patent's terms are either indefinite or lack a written description. On indefiniteness, a patent is invalid "if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). As to lack of written description, 35 U.S.C. § 112(a) requires the specification of the patent to "contain a written description of the invention." 35 U.S.C. § 112 (a). The Federal Circuit has explained that the "essence of the written description requirement is that a patent applicant, as part of the bargain with the public, must describe his or her invention so that the public will know what it is and that he or she has truly made the claimed invention." *Quake v. Lo*, 928 F.3d 1365, 1373 (Fed. Cir. 2019) (cleaned up). "The purpose of the written description requirement is to prevent an applicant from later asserting that he invented that which he did not." *Id.* (cleaned up). As discussed next, none of Shure's arguments raises a substantial question of the '806 Patent's validity.

a. Claim 1

First, Shure argues that the term "drop space" in Limitation 5 of Claim 1 is indefinite and lacks a written description. R. 399-1, Shure Am. Final Invalidation Content. Exh. 1 at 36-37; R. 402, Shure Resp. at 29-30 (redacted). Shure's argument has to do with ClearOne's addition of the term "drop space" to the patent. R. 399-1, Shure Am. Final Invalidation Content. Exh. 1 at 36-37. ClearOne added the term to the

dependent claims in June 2017 and attempted to add it to the specification at the same time. *Id.* But the term was not added to the specification until after the patent issued and ClearOne filed a Certificate of Correction. *Id.* Before the term was added to Claims 1, 8, and 15, the limitation already disclosed that the array would be “coupled to the back side of [the] ceiling tile.” ’806 Patent Col. 13:27-28. Shure contends that because the patent only issued after the addition of the disclosure that “all or part of [the] beamforming microphone array [would be] in the drop space,” there must be some difference between the “coupled to the back side” language and the language locating the array in the drop space. R. 399-1, Shure Am. Final Inv. Content. Exh. 1 at 36-37 (“This distinction indicates that there is a difference between the ‘back side’ of the ceiling tile, and the start of any ‘drop space.’ However, the specification does not indicate what that difference is.”). Shure argues that because the ’806 Patent is not clear about what that difference is, Limitation 5 of Claim 1 is indefinite and lacks a written description.

There are two problems with Shure’s argument. First, the claim construction of “drop space” adopted by the Court, as detailed earlier in this Opinion, is not dependent on the back side of the ceiling tile. In other words, Shure’s argument is premised on Shure’s proposed construction of “drop space”—but that construction was rejected. Second, there is no real conflict between language that describes the BFMA as being all or in part in the “drop space” and language that describes the BFMA as “coupled to the back side” of the ceiling tile. Those terms play different roles in describing the invention. For its part, the term “coupled to the back side” describes

where and how the array is attached to the rest of the tile. In contrast, “all or part in the drop space” refers to how the BFMA is positioned in relation to the drop space. The terms are not so redundant that the patent is indefinite or lacks a written description.

b. Claim 5

Second, Shure argues that Claim 5 is invalid for lack of written description. R. 399-1, Shure Am. Final Inv. Content. Exh. 1 at 44; R. 402, Shure Resp. at 30 (redacted). Shure’s argument about Claim 5 is that the term “grille,” which was added as an amendment to the specification in March 2017 and as a new claim in June 2017 is not synonymous with the other items listed with it in the specification. *Id.* Aside from the claims themselves, the term “grille” is used twice in the specification. For example: “The front surface 220 may be substantially flat, though may include other surface configurations such [as] contours, corrugations, depressions, extensions, grilles, and so on, based on intended applications.” ’806 Patent Col. 7:12-15; *see also id.* 9:60-62. Shure contends that a “grille” is not similar enough to a “contour” or “corrugation,” and as a result, the additions of the term “grille” to the specification and to Claim 5 should have been rejected as new matter. R. 399-1, Shure Am. Final Invalidity Content. Exh. 1 at 44.

But a “grille” is not categorically dissimilar to contours, corrugations, and depressions. As the language of the patent suggests, they are all “surface configurations” of the tile. In other words, all the items in the list describe the design or pattern of the material making up the room-facing surface of the tile. The bottom

line is that it is clear what a grille is (so it is reasonably certain what it is being claimed), and it is not so incongruous with other items listed in the original filing that it creates a substantial question of the '806 Patent's validity.

c. Claim 6

Third, Shure argues that Claim 6 is indefinite because it requires an “outer surface” to be “coplanar” with “said ceiling tile,” even though—according to Shure—the “outer surface” is elsewhere defined as the outer surface *of* the ceiling tile. '806 Patent Col. 13:6-7; R. 402, Shure Resp. at 30-31 (redacted). In its reply, ClearOne argues that it would be possible to have one product, described in Claim 6, in which “the outer surface of the apparatus is on the same plane as the drop ceiling,” and another product, described in Claim 7, in which “the outer surface extends below the plane of the drop ceiling.” ClearOne Reply at 15 (redacted). At the claim construction stage, perhaps in an attempt to avoid the vice of indefiniteness in Claim 6, ClearOne additionally proposed a different construction of the terms in Claim 6, namely, “wherein said outer surface is *configured to be* on the same plane as the plane of said ceiling tile.” R. 520, ClearOne Claim Const. Resp. at 34-35 (emphasis added) (redacted); Claim Const. Hrg. Tr. at 83:14-15 (“ClearOne has offered a claim construction for that term because Shure has argued that th[e] term is indefinite.”). Shure, on the other hand, argues that the claim term is “not amenable to construction” because it is indefinite under 35 U.S.C. § 112(b). R. 508, Shure Claim Const. Br. at 34-35.

The language of the Claim is not indefinite as written. It is possible for an apparatus to have an outer surface that is part of the apparatus but also be considered distinct from the rest of it. In that scenario, the outer surface could be either “coplanar” with the apparatus itself (precisely what Claim 6 sets forth) or it could be an additional structure that—although still part of the apparatus—is lower than the rest of the tile, as in Claim 7. Claim 5 helps illustrate that point. There, the “outer surface comprises a grille.” ’806 Patent 13:40-41. A grille is an outer surface that, while considered part of the tile, could either be located right along the plane of the tile, or a few inches (for example) below it. In either scenario, the grille is still part of the tile. It is simply incorrect that the surface of a thing can never be lower than the thing itself, especially if the “thing” is comprised of various parts. Consider, for example, a light fixture dropping down from the ceiling. One part of the fixture could be a decorative cover that is still considered part of the fixture, but is lower than the rest of it. So too with the outer surface of a ceiling tile. There is no indefiniteness problem here.¹⁶

¹⁶There seems to be another issue, which is whether the “outer surface” referred to in Claim 6 is the outer surface of the BFMA, rather than the outer surface of the tile. ClearOne made arguments at the claim construction hearing that suggested it hopes the outer surface will be understood as that of the BFMA rather than the tile. *See, e.g.*, Claim Const. Hrg. Tr. at 84:5-12 (“[T]he patent discusses the plane of an array and also discusses the plane of the drop ceiling ... in which the front surface of the ceiling tile is dropped below the plane of the array and below the plane of the drop ceiling so as to move the microphones of the array away from the drop ceiling.”). The confusion seems to stem from a specification in the patent that refers to the “front surface of the Array 116” and describes a scenario in which the front surface of the BFMA and the tile line up (rather than the tile and its own outer surface). *See* ’806 Patent Col. 9:38-45. To be clear—the language in Column 9 notwithstanding—the “said outer surface” in Claim 6 *cannot* refer to the outer surface of the BFMA. In Claim 6, “said outer surface” clearly refers back to Limitation 2 of Claim 1, which discloses “a ceiling tile with an outer surface on the front side of said ceiling tile wherein said outer surface is acoustically transparent.” *Id.* Col. 13:18-20. Claim 6, as a dependent claim of Claim 1, of

Having decided that Claim 6 is not indefinite, the next question is whether it needs to be interpreted. ClearOne’s proposed construction modifies the language of the patent only slightly, by adding three words: “configured to be.” But ClearOne fails to provide a convincing reason for why a jury needs “configured to be” in order to understand the Claim, and it is not clear how “configured to be” makes the Claim *more* definite or would otherwise mitigate the potential issue that Shure has raised (which in any case, as explained above, is not a fatal one). *See generally*, R. 520, ClearOne Claim Const. Resp. at 34-35 (redacted). So the Court need not construe the language of Claim 6. It will be read for its plain and ordinary meaning, and it is not indefinite under 35 U.S.C. § 112(b).

D. Irreparable Harm

Moving on from the infringement and invalidity issues (which address the likelihood of success), the next question is whether ClearOne has clearly shown that it is suffering irreparable harm without an adequate legal remedy. Specifically, when a party seeks the extraordinary remedy of a preliminary injunction, it “must make a clear showing that it is at risk of irreparable harm, which entails showing a likelihood of substantial and immediate irreparable injury.” *Apple, Inc. v. Samsung Elecs. Co. Ltd.*, 678 F.3d 1314, 1325 (Fed. Cir. 2012) (“*Apple I*”) (cleaned up). For the harm

course, invokes that language directly: “The claim according to claim 1, wherein *said* outer surface is coplanar with said ceiling tile.” *Id.* Col. 13:42-43 (emphasis added). So, the “said” outer surface is the outer surface of the *tile*—not the outer surface of the BFMA (which is still part of the apparatus and integrated with the ceiling tile). *See* Claim Const. Hrg. Tr. at 86:24-87:7 (counsel for Shure drawing the same distinction). Claim 5 supports the same reading: while a BFMA is unlikely to have a grille as an outer surface, a ceiling tile apparatus certainly could. *See* ’806 Patent Col. 13:40-41.

inquiry, the Court considers factors like “the nature of competition between the patentee and the infringer, the willingness [(or refusal)] of a patentee to license, and any lost sales the patentee has proven.” *Presidio Components, Inc. v. Am. Tech. Ceramics Corp.*, 875 F.3d 1369, 1383 (Fed. Cir. 2017). In addition to harm, the patentee must show that there is a “sufficiently strong causal nexus” between the harm and the infringement. *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 695 F.3d 1370, 1374 (Fed. Cir. 2012) (“*Apple II*”). ClearOne has met its burden of showing both harm and causal nexus.

1. Harm

The Court has previously found that Shure’s sale of the MXA910 is harming ClearOne, R. 279, Mem. Op. and Order (redacted), and many of the facts that established harm in the context of the ’186 Patent are still true now. For example, ClearOne lost opportunities to install its microphones at [REDACTED], as well as at [REDACTED], and some of ClearOne’s existing customers have started switching to Shure microphones. *Id.*; R. 363, Waadevig Rep. ¶¶ 69-71; 74 (sealed).

Since then, ClearOne has learned about additional sales that it has lost to the MXA910. First, ClearOne lost a sale to American Water, which chose the MXA910 at least in part because it could be integrated into a drop ceiling. R. 361, DiCampello Decl. ¶¶ 12-18 (sealed); R. 362, Waadevig Rep. ¶ 69(a) (redacted). American Water was previously a ClearOne end user, R. 371, DiCampello Decl ¶ 12 (redacted), and according to the audio integrator (essentially the distributor-installer of conferencing

systems), the lost sale was worth around \$140,000, *id.* ¶ 16 (redacted). Also, ClearOne recently learned that it lost a sale to Bristol-Myers Squibb, which instead went with Shure after a side-by-side comparison (or “shoot-out”) in which ClearOne believes its audio actually performed better than the MXA910’s. R. 371, DiCampello Decl. ¶¶ 19-23 (redacted); R. 362, Waadevig Rep. ¶ 69(b) (redacted). Finally, ClearOne lost a sale to a “major hardware and software company.” R. 364, Hakimoglu Decl. ¶¶ 19-22 (redacted); R. 362, Waadevig Rep. ¶ 69(c) (redacted). Although the company does allow different end users at different locations to use different audio conferencing equipment, the end users at the company apparently typically prefer the MXA910 because it “remain[s] out of sight in a ceiling tile.” R. 364, Hakimoglu Decl. ¶ 22 (redacted). ClearOne has identified several other end users and integrators with which it may have lost opportunities over the past months. R. 363, Waadevig Rep. ¶ 71 (sealed).

As the Court found in the context of the ’186 Patent, lost sales in the installed audio-conferencing market are particularly devastating because end users often use the same brand of audio conferencing equipment throughout their facilities and because sales tend to be infrequent given the long life-span of the equipment. *See* R. 279, Mem. Op. and Order. at 41 (redacted); R. 364, Hakimoglu Decl. ¶ 15 (“Customers purchase installed audio conferencing products rarely, so those who have already installed an MXA910 are unlikely to purchase a replacement for several years.”) (redacted); R. 362, Waadevig Rep. ¶ 67 (“[B]ecause audio conferencing products are expensive and durable, end users typically will not purchase an upgrade for several

years.”) (redacted). The dynamics of the installed audio conferencing market and the technology itself contribute to a scenario where integrators and end users are incentivized to stick with one vendor or product for as long as is feasible. R. 362, Waadevig Rep. ¶¶ 40-41 (describing how audio conferencing end users “prefer[] to deal with the same vendor for all their installed audio conferencing needs” and the reasons why) (redacted); *id.* ¶¶ 49-52 (explaining the factors that contribute to the high cost of switching vendors for most integrators and consultants) (redacted); *id.* ¶ 59 (pointing out that purchasers often buy in volume to outfit as many conference rooms as possible) (redacted). ClearOne believes this to be the case for Bristol-Myers Squib: it was the understanding of one of ClearOne’s sales managers, Jason DiCampello, “that in choosing the MXA910, Bristol-Myers was selecting the beamforming microphone with which it will standardize its facilities for the foreseeable future.” R. 371, DiCampello Decl. ¶ 24 (redacted).

ClearOne also maintains that it continues to suffer other intangible harms, like loss of customer goodwill and reputation. ClearOne’s BMA-1 used to be “the only beamforming microphone of its kind.” R. 371, DiCampello Decl. ¶ 6 (redacted). Now, ClearOne is concerned that it is no longer the “cool new product,” and that instead, Shure’s MXA910 is. *Id.* ¶ 17 (redacted). ClearOne’s evidence shows that “this reputation matters” to consultants and integrators. *Id.* (redacted). And it is not clear that whenever ClearOne releases its own product practicing the ’806 Patent it will regain its reputation. R. 361, DiCampello Decl. ¶ 10 [REDACTED]

[REDACTED]

[redacted] (sealed); R. 365, Hakimoglu Decl. ¶ 16 [redacted]

[redacted] (sealed). Waadevig agrees. R. 362, Waadevig Rep. ¶¶ 79-86 (explaining that integrators and purchasers are more likely to “invest in their relationship[s]” with “vendors who are perceived as thought leaders.”) (redacted).

ClearOne’s loss of market share is the starkest evidence of the harm it has suffered and is likely to continue to suffer. Almost immediately after the MXA910 was released in 2016, ClearOne’s BMA sales declined. R. 363, Waadevig Rep. ¶¶ 87-91 (sealed). ClearOne’s DSP sales have also decreased, in part because the MXA910 can be used with several different DSPs, while the BMA-1 requires use of ClearOne’s. *Id.* ¶¶ 92-93. These sales losses also have led ClearOne to drop prices on all its DSP platforms more than the industry average. *Id.* ¶¶ 96-97 (identifying several reasons for the DSP price drops, but claiming they are in part “an attempt to compete on price with Shure’s MXA910 and compatible DSP products.”). ClearOne has learned of additional lost sales, and its stock price has continued to plummet. R. 364, Hakimoglu Decl. ¶ 12 (redacted).

It also remains the case that ClearOne refuses to license its technology, including the ’806 Patent. ClearOne’s CEO, Zee Hakimoglu, continues to maintain that ClearOne has no plans to license the ’806 Patent’s technology, in part because “[n]o license could make up for” losing exclusive control of its patented technology. R. 365, Hakimoglu Decl. ¶¶ 17-18 (sealed). As the Federal Circuit has held,

unwillingness to license weighs in favor of a finding of irreparable harm. *See Presidio*, 702 F.2d at 1363; *Douglas Dynamics, LLC v. Buyers Prods. Co.*, 717 F.3d 1336,1345 (Fed. Cir. 2013).

Shure has argued in this litigation that more installed audio conferencing devices are now on the market, and that the increased competition changes the calculus from when the Court decided the analogous issue in ClearOne’s favor for the ’186 Patent. *See Shure Resp.* at 38-39. Shure’s Senior Director, Chad Wiggins, has described several wall- and ceiling-mounted beamforming products that have become more prominent in the audio conferencing market since the ’186 Patent litigation. R. 418, Wiggins Decl. ¶¶ 19-21 (sealed). Those include a product produced by Sennheiser, similar to the MXA910, which has allegedly become more competitive in price in recent months. *Id.* ¶¶ 20-21 (sealed); *see also* R. 442, Giza Exh. 137, Wiggins Dep. Tr. at 145:15-146:10 [REDACTED]

[REDACTED] (sealed). ClearOne disputes that there has been a real change in circumstances and points out that [REDACTED] [REDACTED]. R. 439, ClearOne Resp. at 19 (sealed); *see* R. 442, Giza Exh. 137, Wiggins Dep. Tr. at 114:10-116:12, 148:19-151:23 (sealed).

But more importantly, there is no disagreement that ClearOne’s BMA directly competes with Shure’s MXA910 in the installed audio conferencing market. R. 440, ClearOne Reply at 19 (redacted). Both products are “installed audio conferencing endpoints.” R. 362, Waadevig Rep. ¶ 24 (redacted). And as described above, there is

ample evidence that they have previously competed directly for several different sales. That is an important factor: The Federal Circuit has held that direct competition is “one factor suggesting strongly the potential for irreparable harm.” *Apple, Inc. v. Samsung Elecs. Co., Ltd.*, 809 F.3d 633, 653-54 (Fed. Cir. 2015) (“*Apple IV*”) (cleaned up); *Douglas*, 717 F.3d at 1344-45. There is simply no requirement that the ClearOne BMA and the Shure MXA910 be the *only* products on the market. *Robert Bosch LLC v. Pylon Mfg. Corp.*, 659 F.3d 1142, 1151 (Fed. Cir. 2011) (“[W]ithout additional facts showing that the presence of additional competitors renders the infringer’s harm reparable, the absence of a two-supplier market does not weigh against a finding of irreparable harm.”).

2. Nexus

ClearOne has established that its injuries are caused at least in part by the infringing aspects of Shure’s MXA910. It is worth clarifying at the outset that ClearOne does not need to show that the patented features of its product are the only or even the main reason for consumer demand for it. *See Genband US LLC v. Metaswitch Networks Corp.*, 861 F.3d 1378, 1382-84 (Fed. Cir. 2017) (explaining that the patented feature need only be “*a* driver” rather than “*the* driver” of demand). Instead, ClearOne need only show “some connection between the patented feature and demand.” *Apple, Inc. v. Samsung Elecs. Co., Ltd.*, 735 F.3d 1352, 1364 (Fed. Cir. 2013) (“*Apple III*”). This can be done in a number of ways, including by showing that the patented features are one of many factors in consumers’ purchasing decisions, or by showing that the presence of the patented features makes the product significantly

more desirable. *Id.*; see also *Apple IV*, 809 F.3d at 644 (holding that causal nexus was established by showing that the features at issue “were important to customers when they were examining their phone choices”).

There is clearly a nexus between ClearOne’s loss of sales, market share, and reputation, and the MXA910’s integration of a BFMA with a ceiling tile that can be mounted flush in a drop ceiling. As noted above, ClearOne lost a sale to American Water in part because the MXA910 could be integrated into a drop ceiling. ClearOne has also heard from at least one integrator that “its end user customers prefer the MXA910’s form factor over the BMA’s due to the MXA910’s aesthetic appeal—specifically, because it can drop right into a ceiling tile.” R. 371, DiCampello Decl. ¶ 8 (redacted). The integrator liked the MXA910 for that reason, too. *Id.* (redacted). ClearOne’s expert, Paul Waadevig, has also explained why the flush mounting option is appealing to so many: “[T]he visual integration of such a product into a conference room is important as well. ... [I]n installed audio end users prefer conferencing products that ... are also unobtrusive once installed.” R. 362, Waadevig Rep. ¶¶ 31, 35 (“Because [the MXA910] finally satisfies the demand for a seamlessly-integrated, high-quality installed audio microphone, it is highly innovative.”) (redacted). In response, Shure offers other reasons for the MXA910’s success, [REDACTED]. R. 418, Wiggins Decl. ¶¶ 11, 15 (sealed). But ultimately Wiggins (Shure’s own executive) acknowledges that [REDACTED] *Id.*; see also R. 442, Giza Exh. 137, Wiggins Dep. Tr. at 181:25-182:5 [REDACTED]

[REDACTED]
[REDACTED] (sealed).

Shure also points to evidence that there were other issues with the production and sale of ClearOne's BMA, suggesting that ClearOne's drop in market share is less a result of competition from the MXA910 and more the natural consequence of its alleged low quality. Shure also points out that [REDACTED] [REDACTED] and that it does not allow for adjustable beams. R. 413, Shure Resp. at 37-38 (sealed). Also, Shure points to emails and other communications between ClearOne managers and employees and its end users and integrators, all [REDACTED] *Id.* at 38 (sealed) (citing R. 422, Patel Exh. 73-78 (sealed)). But some of the communications identified by Shure do not relate to the quality of the products themselves. For example, an email exchange between Hakimoglu and a product line manager in April 2015 appears to have more to do with preparation than function. *See generally* R. 422, Patel Exh. 78 [REDACTED] [REDACTED] (sealed). But in any case, Shure has not presented any evidence actually linking these anecdotes to the BMA's poor performance against the MXA910.

At the hearing, Shure also argued that the presence of other competitors of ClearOne's BMA would make it difficult to remedy the harm suffered by ClearOne by enjoining Shure. That is, to Shure's way of thinking, any sales that would have gone to the MXA910 might not go to ClearOne's BMA anyway. Prelim. Inj. Hrg. Tr. at

150:10-152:1. But the presence of other competitors does not weaken ClearOne's rights under its patent. If ClearOne believes that other potential competitors are infringing the patent, then it may choose to litigate against them as well. And in any case, even if some of the displaced sales went to companies other than ClearOne, the fact that Shure would not gain those customers would prevent ClearOne from having to compete against Shure to regain them in the future. Also, [REDACTED]. See R. 365, Hakimoglu Decl. ¶ 14 (sealed).

Finally, in its response to ClearOne's motion, Shure asserted that, because ClearOne did not yet market a product practicing the '806 Patent, "its theory of irreparable harm [was] even more convoluted." R. 402, Shure Resp. at 37 (redacted). But ClearOne was not required to practice the patent to be irreparably harmed by Shure's infringement of it. See *Presidio*, 702 F.3d at 1363 ("Even without practicing the claimed invention, the patentee can suffer irreparable injury. Direct competition in the same market is certainly one factor suggesting strongly the potential for irreparable harm without enforcement of the right to exclude."). At any rate, ClearOne has since announced that it has begun selling a product that practices the '806 Patent. See R. 479, Not. of Release of Product. But the new product does not significantly change the analysis: the evidence was already clear that the BMA itself had been competing directly—albeit unsuccessfully—with the MXA910.

Relatedly, Shure also seems to argue that it is implausible that the MXA910 could harm ClearOne by infringing both the '186 Patent and the '806 Patent. R. 402,

Shure Resp. at 37 (“ClearOne has already argued that its harm has been caused by Shure’s alleged infringement of the ’186 Patent. Now it uses its same charts and same data to allege that same harm is *actually* caused by the ’186 Patent”) (redacted). But there is nothing odd about competing products having different features that contribute to customer buying decisions. And, as discussed above, the evidence clearly proves that the BMA-tile integration is a material factor in customers’ decision-making.

E. Inadequate Remedy at Law

The question of adequate remedy at law is often closely related to the irreparable harm inquiry. As explained above, ClearOne has shown that it is losing sales to Shure and is likely to lose more. The structure of the market makes it hard to measure the impact of these sales. As discussed earlier in the Opinion, a single lost sale could mean a loss of yet more business down the road, because integrators and users prefer to stick with the audio technology they know. And it is difficult to know with certainty even which sales have been lost thus far, because neither company sells directly to its end users. R. 362, Waadevig Rep. ¶ 72 (redacted). From this evidence, it is clear that money damages would be difficult to quantify, which is evidence that remedies at law are inadequate to compensate for the harm. *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1368 (Fed. Cir. 2017) (“Where the injury cannot be quantified, no amount of money damages is calculable, and therefore the harm cannot be adequately compensated and is irreparable.”); *i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 862 (Fed. Cir. 2010); *Broadcom Corp. v. Qualcomm*

Inc., 543 F.3d 683, 703-04 (Fed. Cir. 2008). ClearOne has also pointed to evidence of other hard-to-measure harms, such as the loss of its reputation as a market-leading innovator. ClearOne affirms that it has no plans to license the patented technology because it benefits so much from exclusivity. R. 365, Hakimoglu Decl. ¶¶ 17-18 (sealed). This loss of exclusivity cannot easily be made whole by money damages. *See Douglas*, 7171 F.3d at 1345 (holding that remedies at law were inadequate to compensate patentee’s reputation loss from infringement); *i4i*, 598 F.3d at 862. An injunction is the right remedy for these harms.

F. Balance of Harms and the Public Interest

The last two preliminary-injunction factors ask the Court to weigh the relative costs and benefits of an injunction to ClearOne and Shure, and to examine whether an injunction is in the public interest. *Metalcraft*, 848 F.3d at 1369, (citing *Luminara Worldwide, LLC v. Liown Elecs. Co. Ltd.*, 814 F.3d 1343, 1352 (Fed. Cir. 2016)).

To be clear at the outset, Shure’s MXA910 has multiple mounting options, and ClearOne has only alleged that one of them—its drop ceiling mounting configuration—is infringing. *See also* R. 402, Shure Resp. at 32 (“By suggesting the MXA910’s success is due to one of four optional mounting configurations, ClearOne ignores the real reasons for the success.”) (redacted). So an appropriately tailored preliminary injunction in this case would only prohibit Shure from selling the MXA910 to be used in a drop ceiling mounting configuration—it would not impede Shure’s ability to sell the MXA910 for use in other configurations. Additionally, the Court has the discretion to limit the harm to end users who have already installed

the MXA910 in a drop ceiling configuration to continue using it that way, and by allowing Shure to continue servicing those customers.

It is true that the preliminary injunction will impose substantial costs on Shure. Shure would have to modify its promotional and marketing materials, and would very likely lose at least some sales to customers interested solely in drop-ceiling-mounted audio conferencing products.

But Shure does not know how many of its MXA910 sales end up mounted in drop ceiling configurations. R. 418, Wiggins Decl. ¶¶ 8-9 (sealed). The only benchmark it has is the number of special brackets it has sold for mounting the MXA910 to a *hard* ceiling. Even this is a rough gauge because customers can also use suspension mounting to install the MXA910 in a room with a hard ceiling, or buy a different Video Electronics Standards Association (VESA) bracket. R. 410, Wiggins Decl. ¶¶ 6-7 (redacted). But Shure has sold over ██████████ hard-ceiling mounting brackets, which suggests that at least some portion of its customer base uses the MXA910 with a hard ceiling—not in a drop ceiling. R. 418, Wiggins Decl. ¶ 8-9 (sealed).

Shure's uncertainty about how its MXA910s are most often installed makes it difficult to know precisely how much harm Shure would suffer under an injunction. That is not necessarily a problem: because the MXA910 only infringes ClearOne's patent when mounted in a drop ceiling configuration, ClearOne's harm without an injunction is directly related to the number of MXA910s that would be sold for the drop-ceiling mounting. And in any case, because Shure argues that its drop ceiling

mounting option is *not* the primary reason for the MXA910's success, R. 402, Shure Resp. at 32 (redacted), end users who are attracted to the MXA910 for any of its other advantages might not be put off by their inability to mount it in a drop-ceiling grid. And that means it may not expect to see significant losses from an injunction tailored specifically to the drop ceiling mounting configuration.

Of course, in addition to its effect on Shure, an injunction would impose costs on the public. Shure's MXA910 might very well have advantages beyond the fact that it can mount cleanly into a drop ceiling. In addition, because ClearOne is not currently practicing the patent, it is not clear that the public will be able to purchase a practicing product while the injunction is in place. But any harms from loss of competition should be offset by the benefits of the injunction to the public: the point of granting a period of exclusivity over patented technology is to reward innovation and investment in research. The public benefits when this system works, and suffers when patents are infringed, so it is in the public interest—in the long run—to protect valid patents. *See Douglas*, 717 F.3d at 1346 (“While the general public certainly enjoys lower prices, cheap copies of patented inventions have the effect of inhibiting innovation and incentive.”); *Broadcom*, 543 F.3d at 704 (agreeing that “it is generally in the public interest to uphold patent rights”).

IV. Conclusion

For all the reasons detailed above, ClearOne has established that it is likely to succeed on the merits: Shure is likely infringing the '806 Patent, and it has failed to raise a substantial question of the patent's validity. In addition, ClearOne is suffering

irreparable harm from Shure's infringement, and the balance of the harms and the public interest both weigh in favor of issuing an injunction against Shure's infringing sales of the MXA910 going forward. In order to ensure that harm to ClearOne is minimized without placing an unfair burden on Shure, the tailored preliminary injunction is this:

Shure shall cease manufacturing, marketing, and selling the MXA910 to be used in its drop-ceiling mounting configuration, including marketing and selling the MXA910 in a way that encourages or allows integrators to install it in a drop-ceiling mounting configuration. This injunction applies to Shure's officers, agents, servants, employees, and attorneys, as well as anyone who is in active concert or participation with those listed persons. But Shure customers that have already installed the MXA910 in a drop-ceiling mounting configuration shall be permitted to continue using their MXA910s in that way, and Shure will be able to continue servicing those already-installed products.

In the preliminary injunction briefing, the parties did not address the issue of the appropriate amount of the bond ClearOne will have to post under Federal Rule of Civil Procedure 65(c) before the preliminary injunction goes into effect. The parties shall promptly confer over the issue by 5 p.m. Central on August 6, 2019. Absent an agreement, ClearOne shall file its motion to set the security amount by 5 p.m. on August 7, 2019. Shure shall respond by 5 p.m. on August 9, 2019. ClearOne may reply by 5 p.m. on August 12, 2019 (all times Central). In light of the ongoing irreparable harm, these deadlines are not extendable absent extraordinary circumstances.

ENTERED:

s/Edmond E. Chang
Honorable Edmond E. Chang
United States District Judge

DATE: August 5, 2019