PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of **CERTAIN AUDIO PLAYERS AND CONTROLLERS, COMPONENTS THEREOF, AND PRODUCTS CONTAINING SAME**	**Inv. No. 337-TA-1191**

ORDER 20: CONSTRUING THE TERMS OF THE ASSERTED CLAIMS OF THE PATENTS AT ISSUE

(September 25, 2020)

I. INTRODUCTION ..... - 1 -

II. IN GENERAL ..... - 1 -

III. RELEVANT LAW ..... - 2 -

IV. LEVEL OF ORDINARY SKILL IN THE ART ..... - 5 -

V. THE ASSERTED PATENTS ..... - 6 -
- A. The ’258 Patent ..... - 6 -
- B. The ’949 Patent ..... - 8 -
- C. The ’953 Patent ..... - 9 -
- D. The ’959 Patent ..... - 11 -
- E. The ’896 Patent ..... - 13 -

VI. CLAIM CONSTRUCTION ..... - 15 -
- A. Agreed-Upon Constructions ..... - 15 -
- B. Disputed Constructions ..... - 15 -
  1. “local area network” / “wireless local area network” ..... - 15 -
  2. ’949 patent ..... - 20 -
     - a) “independent playback device” ..... - 20 -
  3. ’896 patent ..... - 26 -
     - a) “security key” ..... - 26 -
     - b) “while operating . . .” and “after receiving . . .” ..... - 30 -
     - c) “program instructions . . .” ..... - 33 -
     - d) “at least a second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN” ..... - 36 -
  4. ’959 patent ..... - 40 -
     - a) “equalization [of the audio data]” ..... - 40 -
     - b) “type of pairing” / “first type of pairing” / “second type of pairing” ..... - 47 -

I. INTRODUCTION

The Commission voted to institute this Investigation on February 6, 2020 to determine whether the importation, sale for importation, or sale within the United States after importation of certain audio players and controllers, components thereof, and products containing the same[1] violates section 337 of the Tariff Act of 1930, as amended, due to infringement of U.S. Patent No. 9,195,258 (''the '258 patent''); U.S. Patent No. 10,209,953 (''the '953 patent''); U.S. Patent No. 8,588,949 (''the '949 patent''); U.S. Patent No. 9,219,959 (''the '959 patent''); and U.S. Patent No. 10,439,896 (''the '896 patent'') (collectively, the "Asserted Patents"). *See* 85 Fed. Reg. 7783 (Feb. 11, 2020). Complainant Sonos, Inc. ("Sonos") is the Complainant. The Notice of Investigation named Alphabet Inc. and Google LLC ("Google") as Respondents; however, Google is the only remaining Respondent.[2] The Commission Investigative Staff ("Staff") is participating in this Investigation.

Due to the COVID-19 pandemic, a *Markman* hearing was not held in this Investigation.[3]

II. IN GENERAL

The claim terms construed in this Order are done so for the purposes of this section 337 Investigation. Those terms not in dispute need not be construed. *See Vanderlande Indus.*

[1] The plain language description of the accused products is "networked speaker devices, and devices (for example, mobile phones and laptops) capable of controlling these devices." 85 Fed. Reg. 7783 (Feb. 11, 2020).
[2] Alphabet Inc. was terminated from this Investigation on September 1, 2020. *See* Order No. 18.
[3] For convenience, the briefs and chart submitted by the parties are referred to as:

CMIB	Sonos' Initial *Markman* Brief
CMRB	Sonos' Reply *Markman* Brief
RMIB	Google's Initial *Markman* Brief
RMRB	Google's Reply *Markman* Brief
SMIB	Staff's Initial *Markman* Brief
JC	Updated Joint Proposed Claim Construction Chart

Nederland BV v. Int'l Trade Comm'n, 366 F.3d 1311, 1323 (Fed. Cir. 2004) (noting that the administrative law judge need only construe disputed claim terms).

III. RELEVANT LAW

"An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly construed claims to the device accused of infringing." *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*) (internal citations omitted), *aff'd*, 517 U.S. 370 (1996). Claim construction is a "matter of law exclusively for the court." *Id.* at 970-71. "The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (*en banc*); *see also Markman*, 52 F.3d at 979. As the Federal Circuit has explained, courts must analyze each of these components to determine the "ordinary and customary meaning of a claim term" as understood by a person of ordinary skill in the art at the time of the invention. *Phillips*, 415 F.3d at 1313. "Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language." *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). "Quite apart from the written description and the prosecution history, the claims

themselves provide substantial guidance as to the meaning of particular claims terms." *Id*. at 1314; *see also Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) ("In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point[ ] out and distinctly claim[ ] the subject matter which the patentee regards as his invention.'"). The context in which a term is used in an asserted claim can be "highly instructive." *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.*

The specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." *Id.* at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). "[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Id.* at 1316. "In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor." *Id.* As a general rule, however, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Id.* at 1323. In the end, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be . . . the correct construction." *Id.* at 1316 (quoting *Renishaw PLC v. Marposs Societa´ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Id.* at 1317; *see also Liebel-Flarsheim Co. v. Medrad, Inc.,* 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can "often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the

invention in the course of prosecution, making the claim scope narrower than it would otherwise be." *Phillips*, 415 F.3d at 1317; *see also Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) ("The purpose of consulting the prosecution history in construing a claim is to 'exclude any interpretation that was disclaimed during prosecution.'").

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* at 1317. "The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence." *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

If, after a review of the intrinsic and extrinsic evidence, a claim term remains ambiguous, the claim should be construed so as to maintain its validity. *Phillips*, 415 F.3d at 1327. Claims, however, cannot be judicially rewritten in order to fulfill the axiom of preserving their validity. *See Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999). Thus, "if the only claim construction that is consistent with the claim's language and the written description renders the claim invalid, then the axiom does not apply and the claim is simply invalid." *Id.*

A claim must also be definite. Pursuant to 35 U.S.C. § 112: "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." 35 U.S.C. § 112(b). In *Nautilus, Inc. v. Biosig Instruments, Inc.*, the Supreme Court held that § 112 requires "that a

patent's claims, viewed in light of the specification and prosecution history inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. 898, 910 (2014). A claim is required to "provide objective boundaries for those of skill in the art," and a claim term is indefinite if it "might mean several different things and no informed and confident choice is among the contending definitions." *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1371 (Fed. Cir. 2014). A patent claim that is indefinite is invalid. 35 U.S.C. § 282(b)(3)(A).

IV. LEVEL OF ORDINARY SKILL IN THE ART

Sonos proposes that "a person of ordinary skill in the art has the equivalent of a four-year degree from an accredited institution (typically denoted as a B.S. degree) in computer science, computer engineering, electrical engineering, or an equivalent thereof, and approximately 2-4 years of professional experience in the fields of networking and network-based systems or applications, such as consumer audio systems, or an equivalent level of skill, knowledge, and experience." CMIB at 8 n.4.

Google did not propose a level of ordinary skill in the art in its briefs. Its experts, however, address the issue in their expert declarations, submitted as exhibits. For example, Dr. Shoemake states:

> I understand that Respondents contend that a person of ordinary skill in the art in the '258, '953, '896, and '949 patents at the time of the alleged invention would have had the equivalent of a four-year degree from an accredited institution (typically denoted as a B.S. degree) in computer science, computer engineering, electrical engineering, or an equivalent thereof, and approximately 4 years of professional experience in the fields of networking and network-based systems or applications, such as consumer audio systems, or an equivalent level of skill, knowledge, and experience. A person with slightly less technical education but slightly more practical experience, or more technical education (e.g., a Master degree in the same fields) but less practical experience (e.g., 2 years), could have met that standard.

RMIB Ex. 9 at ¶ 15; *see also* RMIB Ex. 6 at ¶ 26; RMIB Ex. 7 at ¶ 49; RMIB Ex. 8 at ¶ 34.

Staff agrees with Sonos' proposed level of ordinary skill in the art because it requires slightly less experience. SMIB at 4.

The undersigned finds Sonos' proposal best reflects the level of skill in the art at the time of the asserted patents.[4] Accordingly, the undersigned finds that a person of ordinary skill in the art with respect to the asserted patents would have at least (a) a Bachelor's degree in computer science, computer engineering, electrical engineering, or an equivalent thereof, and (b) 2-4 years of professional experience in the fields of networking and network-based systems or applications, such as consumer audio systems, or an equivalent level of skill, knowledge, and experience. The undersigned also finds that additional graduate education could substitute for professional experience and significant work experience could substitute for formal education.

V. THE ASSERTED PATENTS

A. The '258 Patent

The '258 patent, entitled "System and Method for Synchronizing Operations Among A Plurality of Independently Clocked Digital Data Processing Devices," issued on November 24, 2015 to Nicholas A. J. Millington. The '258 patent is assigned to Sonos. The '258 patent relates to "the field of arrangements that synchronize output generated by a number of output generators, including audio output, video output, combinations of audio and video, as well as other types of output . . . provided by a common channel." '258 patent at 1:44-49.

The '258 patent has 26 claims. Claims 17, 21-24, and 26 are asserted in this Investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms <u>underlined</u> and the disputed terms in **bold**):

[4] The undersigned notes that while the parties have proposed slightly different levels of skill in the art, the differences do not appear to be material to claim construction. CMIB at 8 n.4; SMIB at 4; RMIB Ex. 7 at ¶ 51; RMIB Ex. 8 at ¶ 36; RMIB Ex. 9 at ¶ 17.

17. A first zone player comprising: a network interface configured to interface the first zone player with at least a **local area network (LAN)**; a device clock configured to generate clock time information for the first zone player; one or more processors; and a tangible, non-transitory computer-readable memory having instructions stored thereon that, when executed by the one or more processors, cause the first zone player to: receive control information from any one of a plurality of controllers over the LAN via the network interface, wherein the received control information comprises a direction for the first zone player to enter into a synchrony group with at least a second zone player; in response to the direction, enter into the synchrony group with the second zone player, wherein in the synchrony group, the first and second zone players are configured to playback audio in synchrony based at least in part on (i) audio content, (ii) playback timing information associated with the audio content, wherein the playback timing information is generated by one of the first or second zone players, and (iii) clock time information for the one of the first or second zone players, and wherein the generated playback timing information and the clock time information are transmitted from the one of the first or second zone players to the other of the first or second zone players, wherein the first and second zone players remain independently clocked while playing back audio in synchrony; and transmit status information to at least one of the plurality of controllers over the LAN via the network interface, wherein the status information comprises an indication of a status of the synchrony group.

21. The first zone player of claim 17, wherein the status information further comprises one or both of (a) an identification of a zone player that is operating as a master device of the synchrony group and (b) an identification of at least one zone player that is operating as a slave device of the synchrony group.

22. The first zone player of claim 17, wherein the first zone player comprises a master device of the synchrony group.

23. The first zone player of claim 17, wherein the tangible computer-readable memory further has instructions stored thereon that, when executed by the one or more processors, cause the first zone player to determine whether the first zone player is operating as a master device of the synchrony group, and wherein the instructions that cause the first zone player to transmit status information to the at least one of the plurality of controllers comprise instructions that cause the first zone player to transmit status information to the at least one of the plurality of controllers only while the first zone player is operating as the master device of the synchrony group.

24. The first zone player of claim 23, wherein the tangible computer-readable memory further has instructions stored thereon that, when executed by the one or more processors, cause the first zone player to: receive audio content via the network interface; and while the first zone player is operating as the master device of the synchrony group, transmit the received audio content, via the network interface, to at least one zone player that is operating as a slave device of the synchrony group.

26. The first zone player of claim 17, wherein the first zone player is a master zone player of the synchrony group, wherein the audio content comprises a plurality of frames, wherein the playback timing information associated with the audio content comprises a playback time for each frame of the audio content, and wherein the first zone player is configured to play back audio in synchrony with the second zone player based at least in part on (i) the audio content, (ii) playback timing information associated with the audio content, wherein the playback timing information is generated by the first zone player, and (iii) clock time information for the first zone player, and wherein the generated playback timing information and the clock time information are transmitted from the first zone player to the second zone player; and wherein the first zone player playing back audio in synchrony comprises, for each frame of the audio content, the first zone player playing back the frame when the device clock of the first zone player is the same as the playback time for the frame.

B. The '949 Patent

The '949 patent, entitled "Method and Apparatus for Adjusting Volume Levels in a Multi-Zone System," issued on November 19, 2013 to Robert A. Lambourne and Nicholas A. J. Millington. The '949 patent is assigned to Sonos. The '949 patent relates to "user interfaces for controlling or manipulating a plurality of multimedia players in a multi-zone system." '949 patent at 1:27-30. An Ex Parte Reexamination Certificate issued November 5, 2015 in response to Reexamination Request No. 90/013,423 (filed January 5, 2015). Compl. at ¶ 68. The Reexamination Certificate states: "Claims 1, 3, 4, 5, 6, 8, 10, 11, 13, 14, 15 and 17-20 are determined to be patentable as amended. Claims 2, 5, 9, 12, and 16, dependent on an amended claim, are determined to be patentable." *Id*; *see also* Compl. Ex. 5.

The '949 patent has a total of 20 claims. Claims 1, 2, 4, and 5 are asserted in this Investigation. The asserted claims[5] read as follows (with the first instance of the agreed-upon terms <u>underlined</u> and the first instance of the disputed terms in **bold**):

1. A <u>multimedia</u> controller including a processor, the controller configured to: provide a user interface for a <u>player</u> group, wherein the player group includes a plurality of players in a **local area network**, and wherein each player is an **independent <u>playback device</u>**

[5] The language of claims 1 and 4 is copied directly from the reexamination certificate. As such, matter enclosed in brackets [ ] originally appeared in the '949 patent, but has been deleted and matter printed in italics indicates additions made to the '949 patent during reexamination.

configured to playback a multimedia output from a multimedia source; accept via the user interface an input to facilitate formation of the player group, wherein the input to facilitate formation of the player group indicates that at least two of the plurality of players in the local area network are to be included in the player group *for synchronized playback of a multimedia output from the same multimedia source;* for [each of the plurality of players within] *any individual player in* the player group, accept via the user interface [an] *a player-specific* input to adjust a volume [associated with the] *of that individual* player, wherein the *player-specific* input to adjust the volume [associated with the] *of that individual* player causes [the corresponding independent playback device] *that individual player* to adjust its volume; and accept via the user interface [an] *a group-level* input to adjust a volume associated with the player group, wherein the *group-level* input to adjust the volume associated with the *player* group causes [the corresponding independent playback devices] *each of the players* in the player group to adjust [their volumes] *its respective volume.*

2. The multimedia controller of claim 1, wherein the controller is further configured to accept via the user interface an input to remove one of the plurality of players from the player group.

4. The multimedia controller of[claim 3] *claim 1,* wherein the *group-level* input to [mute] *adjust the volume associated with* the player group *further* causes [the players in the player group to adjust their volumes further comprises]: the controller [sending] *to send* an instruction to one of the players in the player group, the instruction indicating that the volumes of each of the players in the player group should be adjusted in scale.

5. The multimedia controller of claim 1, wherein the controller is further configured to accept via the user interface an input to name the player group.

C. The ’953 Patent

The ’953 patent, entitled “Playback Device,” issued on February 19, 2019 to Nicholas A. J. Millington. The ’953 patent is assigned to Sonos. The ’953 patent relates generally to “the field of digital data processing devices, and more particularly to systems and methods for synchronizing operations among a plurality of independently-clocked digital data processing devices.” ’953 patent at 1:30-34.

The ’953 patent has 30 claims. Claims 7, 12-14, and 22-24 are asserted in this Investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms <u>underlined</u> and first instance of the disputed terms in **bold**):

7. A first zone player comprising: a network interface that is configured to provide an interconnection with at least one data network; a clock that is configured to provide a clock time of the first zone player; at least one processor; a tangible, non-transitory computer-readable medium; and program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform functions comprising: receiving a request to enter into a synchrony group with at least a second zone player that is communicatively coupled with the first zone player over a **local area network (LAN)**; in response to receiving the request to enter into the synchrony group, entering into the synchrony group with the second zone player, wherein the first zone player is selected to begin operating as a slave of the synchrony group and the second zone player is selected to begin operating as a master of the synchrony group, and wherein the clock time of the first zone player differs from a clock time of the second zone player; after beginning to operate as the slave of the synchrony group: receiving, from the second zone player over the LAN, clock timing information that comprises at least one reading of the clock time of the second zone player; based on the received clock timing information, determining a differential between the clock time of the first zone player and the clock time of the second zone player; receiving, from the second zone player over the LAN, (a) audio information for at least a first audio track and (b) playback timing information associated with the audio information for the first audio track that comprises an indicator of a first future time, relative to the clock time of the second zone player, at which the first and second zone players are to initiate synchronous playback of the audio information for the first audio track; updating the first future time to account for the determined differential between the clock time of the first zone player and the clock time of the second zone player; and when the clock time of the first zone player reaches the updated first future time, initiating synchronous playback of the received audio information with the second zone player.

12. The first zone player of claim 7, wherein receiving the audio information for the first audio track from the second zone player over the LAN comprises: receiving a series of frames that each include a respective portion of the obtained audio information for the first audio track.

13. The first zone player of claim 12, wherein a first frame in the series of frames includes the indicator of the first future time.

14. The first zone player of claim 13, wherein the playback timing information further comprises, for each subsequent frame in the series of frames: an indicator of a respective future time, relative to the clock time of the second zone player, at which the frame is to be synchronously played back by the first and second zone players.

22. The first zone player of claim 7, further comprising program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions while operating as the slave of the synchrony group: receiving, from the second zone player over the LAN, a command to adjust an individual volume of the first zone player; and in response to receiving the command, adjusting the individual volume of the first zone player.

23. The first zone player of claim 7, further comprising program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions: while operating as the slave of the synchrony group, receiving, from the second zone player over the LAN, control information that enables the first zone player to begin operating as the master of the synchrony group; and in response to receiving the control information, transitioning from operating as the slave of the synchrony group to operating as the master of the synchrony group.

24. The first zone player of claim 7, further comprising program instructions stored on the tangible, non-transitory computer-readable medium that are executable by the at least one processor to cause the first zone player to perform the following functions: while operating as the slave of the synchrony group, receiving a request to disengage from the synchrony group; in response to receiving the request to disengage from the synchrony group, disengaging from the synchrony group and transitioning from operating as the slave of the synchrony group to operating as a standalone zone player.

D. The ’959 Patent

The ’959 patent, entitled “Multi-Channel Pairing in a Media System,” issued on December 22, 2015 to Christopher Kalai; Michael Darrell Andrew Ericson; Robert A. Lambourne; Robert Reimann; and Mark Triplett. The ’959 patent is assigned to Sonos. An *Ex Parte* Reexamination Certificate issued on April 5, 2017 in response to Reexamination Request No. 90/013,756 (filed May 25, 2016). Compl. at ¶ 78. As a result of the reexamination, original claims 1 and 14 were cancelled, claims 2-13 and 15-22 were determined to be patentable as amended, and new claims 23-48 were added and determined to be patentable. *Id*.; *see also* Compl. Ex. 7. The ’959 patent relates generally to “devices and methods for providing audio in a multi-channel listening environment (e.g., a stereo sound or home theater surround sound environment).” *Id*. at ¶ 81; *see also* ’959 patent at 1:54-63, 3:32-46.

The ’959 Patent has a total of 48 claims. Claims 5, 9, 10, 29 and 35 are asserted in this Investigation. The asserted claims[6] read as follows (with the first instance of the agreed-upon terms underlined and the first instance of the disputed terms in **bold**):

5. [The playback device of claim 1,] *A playback device configured to output audio in a multi-channel listening environment, the playback device comprising: a network interface configured to receive audio data over a network; a plurality of speaker drivers configured to output audio based on the audio data; one or more processors; and tangible, non-transitory, computer readable memory comprising instructions encoded therein, wherein the instructions, when executed by the one or more processors, cause the playback device to (i) process the audio data before the playback device outputs audio from the plurality of speaker drivers, (ii) determine that a* ***type of pairing*** *of the playback device comprises one of at least a* ***first type of pairing*** *or a* ***second type of pairing****,* wherein in the first type of pairing, the playback device is configured to output audio comprising two channel sound via the plurality of speaker drivers, and wherein in the second type of pairing, the playback device is configured to output audio comprising no more than one channel of the two channel sound via the plurality of speaker drivers, *(iii) configure the playback device to perform a first* ***equalization of the audio data*** *before outputting audio based on the audio data from the plurality of speaker drivers when the type of pairing is determined to comprise the first type of pairing, and (iv) configure the playback device to perform a second equalization of the audio data before outputting audio based on the audio data from the plurality of speaker drivers when the type of pairing is determined to comprise the second type of pairing.*

9. [The playback device of claim 1, wherein the playback device is further configured to (i)] *A playback device configured to output audio in a multi-channel listening environment, the playback device comprising: a network interface configured to receive audio data over a network; a plurality of speaker drivers configured to output audio based on the audio data; one or more processors; and tangible, non-transitory, computer readable memory comprising instructions encoded therein, wherein the instructions, when executed by the one or more processors. cause the playback device to (i) process the audio data before the playback device outputs audio from the plurality of speaker drivers, (ii) determine that a type of pairing of the playback device comprises one of at least a first type of pairing or a second type of pairing, (iii) configure the playback device to perform a first equalization of the audio data before outputting audio based on the audio data from the plurality of speaker drivers when the type of pairing is determined to comprise the first type of pairing, (iv) configure the playback device to perform a second equalization of the audio data before outputting audio based on the audio data from the plurality of speaker drivers when the type of pairing is determined to comprise the second type of pairing,* (v) separate the audio data into separate audio channels, [(ii)] *(vi)* output audio based on audio data of at least one separate audio channel from the plurality of

[6] The claim language has been copied directly from the reexamination certificate. As such, matter enclosed in brackets [ ] originally appeared in the ’959 patent, but has been deleted and matter printed in italics indicates additions made to the ’959 patent during reexamination.

speaker drivers, and [(ii)] *(vii)* transmit at least one additional separate audio channel over the network.

10. [The playback device of claim 1, wherein the playback device is further configured to] *A playback device configured to output audio in a multi-channel listening environment, the playback device comprising: a network interface configured to receive audio data over a network; a plurality of speaker drivers configured to output audio based on the audio data; one or more processors; and tangible, non-transitory, computer readable memory comprising instructions encoded therein, wherein the instructions, when executed by the one or more processors, cause the playback device to (i)* receive a signal from a controller over the network, wherein the signal comprises an instruction for the playback device to pair with one or more playback devices, *(ii) process the audio data before the playback device outputs audio from the plurality of speaker drivers, (iii) determine that a type of pairing of the playback device comprises one of at least a first type of pairing or a second type of pairing. (iv) configure the playback device to perform a first equalization of the audio data before outputting audio based on the audio data from the plurality of speaker drivers when the type of pairing is determined to comprise the first type of pairing, and* (v) *configure the playback device to perform a second equalization of the audio data before outputting audio based on the audio data from the plurality of speaker drivers when the type of pairing is determined to comprise the second type of pairing.*

29. *The playback device of claim 5, wherein the playback device is further configured to receive a signal from a controller over the network, wherein the signal comprises an instruction for the playback device to pair with one or more playback devices.*

35. *The playback device of claim 9, wherein the playback device is further configured to receive a signal from a controller over the network, wherein the signal comprises an instruction for the playback device to pair with one or more playback devices*.

E. The ’896 Patent

The ’896 patent, entitled “Playback Device Connection,” issued on October 8, 2019 to Nicholas A. J. Millington and Paul V. Hainsworth. The ’896 patent is assigned to Sonos. The ’896 patent relates to “techniques for connecting various devices to a network for secure communications with a minimum of human interaction and technical ability.” ’896 patent at 1:29-32.

The ’896 patent has 20 claims. Claims 1, 3, 5-6, and 12 are asserted in this Investigation. The asserted claims read as follows (with the first instance of the agreed-upon terms underlined and the first instance of the disputed terms in **bold**):

1. A computing device comprising: a user interface; a network interface; at least one processor; a non-transitory computer-readable medium; and **program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising: while operating on a secure wireless local area network (WLAN) that is defined by an access point, (a) receiving, via a graphical user interface (GUI) associated with an application for controlling one or more playback devices, user input indicating that a user wishes to set up a playback device to operate on the secure WLAN and (b) receiving a first message indicating that a given playback device is available for setup**; **after receiving the user input and receiving the first message, transmitting a response to the first message that facilitates establishing an initial communication path with the given playback device, wherein the initial communication path with the given playback device does not traverse the access point**; transmitting, to the given playback device via the initial communication path, **at least a second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN**; after transmitting at least the second message containing the network configuration parameters, detecting an indication that the given playback device has successfully received the network configuration parameters; and after detecting the indication, transitioning from communicating with the given playback device via the initial communication path to communicating with the given playback device via the secure WLAN that is defined by the access point.

3. The computing device of claim 1, wherein the given playback device comprises a first playback device of a new networked audio system.

5. The computing device of claim 1, wherein communicating with the given playback device via the secure WLAN comprises transmitting a command to the given playback device related to playback of audio content.

6. The computing device of claim 5, wherein the command comprises a command to retrieve audio content for playback from an audio source that is accessible via a communication path that includes the secure WLAN.

12. The computing device of claim 1, further comprising program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising: after transitioning to communicating with the given playback device via the secure WLAN, transmitting a command to the given playback device to form a group with at least a first playback device of a networked audio system such that the given playback device is configured to play back audio content in synchrony with at least the first playback device.

VI. CLAIM CONSTRUCTION

A. Agreed-Upon Constructions

The parties have agreed to the following constructions:

TERM	PATENT(S)	AGREED-TO CONSTRUCTIONS
"zone player" / "playback device" / "player"	8,588,949 9,195,258 9,219.959 10,209,953 10,439,896	"data network device configured to process and output audio"
"network interface"	9,195,258 9,219.959 10,209,953 10,439,896	"physical component of a device that provides an interconnection with a data network"
"playback timing information"	9,195,258 10,209,953	"information indicating when the audio information [content] is to be played back"
"clock time information" / "clock timing information"	9,195,258 10,209,953	"information representing a time value indicated by a device's clock"
"a synchrony group"	9,195,258 10,209,953	"a set of two or more zone players that are to play the same audio program synchronously"
"independently clocked"	9,195,258	"operating in accordance with their own respective clocks during synchronous playback"
"multimedia"	8,588,949	"any type of media that comprises audio (including audio alone)"
"pairing"	9,219,959	"configuration involving two or more playback devices that have different playback roles"

JC at 1-2. The undersigned hereby adopts the parties' proposed constructions and shall construe the terms set forth above according to their agreed-to definitions.

B. Disputed Constructions

1. "local area network" / "wireless local area network"

The term "local area network" appears in claim 1 of the '949 patent, claim 17 of the '258 patent, and claims 7, 12, 22, and 23 of the '953 patent. The term "wireless local area network" appears in claims 1, 5, 6, and 12 of the '896 patent. The parties disagree on the claim construction of these terms and have proposed the following constructions:

SONOS	GOOGLE	STAFF
"data network that links devices within a limited area, such as a home or office"	Plain and ordinary meaning; no construction necessary	Plain and ordinary meaning; no construction necessary

JC at 2.

Sonos argues that "'local area network' is a term of art that was (and still is) commonly understood to mean a data network (or computer network)." CMIB at 13. Sonos further asserts that "[i]t was also commonly understood that a data network was (and still is) a network for transferring digital data packets between networked devices." *Id.* According to Sonos, "the term 'local area network' does not cover a non-data 'network,' such as a 'network' for transferring analog audio between a conventional audio receiver and passive speakers over dedicated speaker wire." *Id.*

Google argues that "local area network" "is a well-known term in the field of networking." RMIB at 3. Google explains: "Because the patents do not ascribe any special meaning to this term . . . it [should] be construed to have its plain and ordinary meaning." *Id.* at 3-4. Google disagrees with Sonos' construction for two reasons. First, while Google does not object to the inclusion of the word "data" before "network," it argues that Sonos is attempting to use the word "data" to improperly limit a "local area network" to a "network that transfers 'digital data packets' between devices." *Id.* at 5. Second, Google asserts that Sonos' construction improperly limits "a LAN to a geographic scope of 'a home or office.'" *Id.* at 4.

Staff agrees that "local area network" should be given its plain and ordinary meaning. SMIB at 6. Staff explains that "[t]his term would have had a well understood meaning to one of ordinary skill in the art." *Id.* 6-7. Staff notes that "the key dispute amongst the parties is whether 'data network' is limited to a network transferring 'digital data packets' between networked

devices." *Id.* at 7 n.1. Staff asserts that limiting "data network" in this way is "inconsistent with the intrinsic evidence (and pertinent extrinsic evidence)." *Id.* at 7.

All parties agree that it is appropriate to include the term "data network" in the construction of "local area network." *See* RMIB at 5; RMRB at 1; SMIB at 7 n.1. The parties' main dispute centers around the application of this term; specifically, whether "data network" should be restricted to a "data network for transferring digital data packets between networked devices."

The undersigned finds that the intrinsic evidence does not support limiting the claims in this manner. While there are references in the specification to both "digital data" and "packets," the law is clear that limitations from the written description should not be read into the claims without other indicia that the patentee so intended to limit the invention. *See Phillips*, 415 F.3d at 1320; *Tate Access Floors, Inc. v. Maxcess Techs., Inc.*, 222 F.3d 958, 966 (Fed. Cir. 2000) ("Although claims must be read in light of the specification of which they are a part, it is improper to read limitations from the written description into a claim."). Here, there is no such evidence. First, there is nothing in the claims themselves that indicate that "local area network" is limited to the transfer of digital data packets. Neither the term "digital" nor "packets" appears in any of the patents' claims. *See* '949 patent, cl. 1; '258 patent, cl. 17; '953 patent, cls. 7, 12, 22, 23; '896 patent, cls. 1, 5, 6, 12.

Nor can Sonos point to anything in the patents' specifications indicating a clear intent to limit "local area network." Instead, Sonos asserts that "by repeatedly and consistently describing a 'local area network' as a 'data network' that transfers 'digital' data 'packets,' the specifications . . . demonstrate that the claimed 'local area network,' is a "data network.'" CMIB at 18; *see also id.* at 20. This alone is not sufficient to read limitations from the specification into the claims.[7] In

[7] Sonos cites to two cases in support of the proposition that, if a patent "repeatedly and consistently" describes a term in a certain manner, the claim construction should likewise construe the term that way. In the cited cases, however,

fact, the Federal Circuit has explained: "[I]t is improper to read limitations from a preferred embodiment described in the specification – even if it is the only embodiment – into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *GE Lighting Sols., Inc. v. AgiLight, Inc.,* 750 F.3d 1304, 1309 (Fed. Cir. 2014). Without such a clear indication, the undersigned declines to limit "local area network" in the manner proposed by Sonos.

The extrinsic evidence also supports this conclusion. The evidence shows that a person of ordinary skill in the art would understand that "local area network" is used to refer to a network that is limited by area. As Dr. Shoemake explains:

> Many network types are defined based on other geographic area. For example, a person of ordinary skill in the art would be familiar with the concepts of PAN, LAN, MAN and WAN, meaning personal area network, local area network, metropolitan area network and wide area network, respectively. A PAN is typically viewed as having a maximum range that is generally around a person's body. This may also be thought of as being consistent with a moderately sized room, office or a vehicle's cabin. A LAN has a maximum range that generally covers a portion of a building, a building, multiple buildings or a campus. A MAN covers a city or a portion of a city. A WAN covers a large area such as multiple cities, a state, country or globe.

RMIB Ex. 9 at ¶ 20. The general understanding of "local area network" thus does not concern the type of data (digital or analog) or manner of transmission (packet or non-packet form). *Id.* at ¶ 18.

Even the extrinsic evidence cited by Sonos does not support adding restrictions on the type or form of data transmitted over the network. Sonos lists definitions from five technical dictionaries in its brief, but four of these relate only to a "data network" generally and do not

---

the repeated and consistent use of a term was not the only evidence informing its construction. For example, in *In re Abbott Diabetes Care, Inc.* 696 F.3d 1142, 1149-1150 (Fed. Cir. 2012), the issue was whether the construction of "electrochemical sensor" could include external cables and wire connecting the sensors to its control unit. While the Federal Circuit noted that the patent "repeatedly, consistently, and exclusively" depicted an electrochemical sensor without external cables or wires, it also stated that the patent "simultaneously disparage[ed] sensors with external cables or wires." *Id.* at 1150; *see also ICU Med., Inc. v. Alaris Med. Sys., Inc.*, 558 F.3d 1368 (Fed. Cir. 2009) (noting that there was "no support from any intrinsic or extrinsic source" to support a reading of the claim term other than the one disclosed in the preferred embodiment).

address the more narrow definition at issue. *See* CMIB at 22 (citing definitions that refer to a "data communications network," "computer network," or "data network," but that do not mention "digital data" or "packets"). The fifth dictionary does define "local area network" as "a packet network . . ." *Id.* (quoting Webster's New World Telecom Dictionary). The fact that one dictionary definition includes a reference to packets does not, however, provide conclusive evidence that a person of ordinary skill in the art would generally understand a "local area network" to be limited to "a data network for transferring digital data packets between networked devices."

Nor does the testimony from Sonos' experts prove that "local area network" is understood in the manner proposed by Sonos. *See* CMIB Ex. 9 at ¶ 43; CMIB Ex. 10 at ¶ 62. As with the dictionaries, the opinions of these experts focus on whether "local area network" is understood as a "data network," and do not specifically address the narrower question. *See* CMIB Ex. 9 at ¶¶ 40-45; CMIB Ex. 10 at ¶¶ 52-63. Neither expert opines, for example, that a person of ordinary skill in the art would understand that "data network" excludes analog audio data or must be in packet form. *Id.* In contrast, Google's expert testifies that a person of ordinary skill in the art would understand that "data" can include either "digital data" or "audio data" and that "local area network" is not limited to data transmitted in packets. RMIB Ex. 9 at ¶¶ 29, 31, 34.

Having rejected Sonos' proposal, the undersigned turns to the question of the appropriate definition. All three experts who offered opinions on this term cite to the Modern Dictionary of Electronics (7th ed. 1999) as an example of how a person of ordinary skill in the art would understand the term. CMIB Ex. 9 at ¶ 42; CMIB Ex. 10 at ¶ 56; RMIB Ex. 9 at ¶ 36; *see also* SMIB at 9-10 (favorably citing to this definition). As such, the undersigned adopts the definition set forth in this dictionary. Accordingly, the undersigned hereby construes the term "local area network" as "***a data communications network spanning a limited geographical area, such as an***

office, an entire building, or industrial park" and "wireless local area network" ***as*** "***a wireless data communications network spanning a limited geographical area, such as an office, an entire building, or industrial park***."

2. '949 patent

a) "independent playback device"

The term "independent playback device" appears in claim 1 of the '949 patent. The parties disagree on the claim construction of this term and have proposed the following constructions:

SONOS	GOOGLE	STAFF
"data network device configured to process and output audio that is capable of playing multimedia separately from other players"	Indefinite	"data network device configured to process and output audio that is capable of independent operation"

JC at 4.

The claim term at issue was added during prosecution of the '949 patent to distinguish the invention over the prior art, specifically U.S. Patent Pub. No. 2004/0131192 ("Metcalf") and U.S. Patent Pub. No. 2002/0124097 ("Isley"). *See* CMIB Ex. 16 at *98-99[8], 118, 122-123, 130, 134.

Google argues that "[t]he plain claim language contradictorily requires the playback device to be in two distinct states at the same time: 'independent' and part of a 'group.'" RMIB at 25. Google further asserts that both the specification and prosecution history fail to provide any guidance as to "how a device can be in both states at the same time; indeed, it expressly distinguishes independent operation from grouped operation." *Id.* Google also disagrees that "an 'independent playback device' need only be 'capable' of operating independently." *Id.* at 28-29. Google notes: "The distinguishing factor between an independent and a grouped player is whether

[8] All citations to CMIB Exhibit 16 are citations to the page number in the corresponding PDF, unless the citation is preceded by the paragraph symbol. For example, this citation refers to pages 98-99 of the PDF. If the citation includes a paragraph symbol, the citation refers to paragraphs included in the declaration of Jon B. Weissman, which appears on pages 2-33 of CMIB Exhibit 16.

the player is playing the same audio in synchrony with other players – not merely whether it has the capability to do so in a different setting." *Id.* at 29. Google also contends that the requirement that the playback devices are independent was added to distinguish the invention over prior art, which disclosed "playback devices capable of playing multimedia separately from other players." *Id.* at 30.

Sonos argues that "an 'independent playback device' is a 'playback device' with certain 'independent' capabilities." CMIB at 36. Sonos asserts that both the claims and the specification describe the playback device in this manner. *Id.* at 37-42. According to Sonos, the "[t]he prosecution history further confirms that 'independent playback device' refers to the capability of a 'player'/'playback device' to play multimedia independently/separately from other 'players,' while also having the capability to be dynamically grouped for synchronized playback." *Id.* at 40.

Staff argues that "its proposed construction most accurately encompasses the capabilities of the independent playback device described in the intrinsic evidence." SMIB at 26. Staff explains that its construction is supported by the claim language, the specification, and the prosecution history. *Id.* at 27-34. Staff further notes that Google's "argument is based on an improper interpretation of claim 1 that its own expert. . . acknowledges renders the claims 'internally inconsistent.'" *Id.* at 34.

Google's argument is based on the premise that the limitation of "independent playback device" requires that playback devices simultaneously play media individually and as part of a group. As the parties acknowledge, doing so is impossible. *See* CMIB at 38 (arguing that these are "conflicting functions"); Rinard Dec. at ¶ 41 (opining that such requirements are "internally inconsistent"). In order for Google's argument to prevail, the undersigned must therefore find that the intrinsic evidence shows that Sonos intentionally added an impossible requirement into the

claims. *See, e.g.,* RMIB at 26 ("[T]he claim language that Sonos' prosecution counsel chose to add to distinguish the prior art during prosecution impossibly requires the devices to be in two distinct states at the same time – independent and grouped."). The evidence does not support such a finding. Instead, the intrinsic evidence is consistent with Sonos' and Staff's reading of the claim: that "independent playback devices" are devices with certain "independent" capabilities.[9]

First, the claim language supports this reading. Claim 1 requires a "player group . . . wherein each player is an independent playback device configured to playback a multimedia output from a multimedia source." '949 patent, cl. 1. The plain language of the claim therefore requires that the playback devices be part of a "player group," but have the capability to play media independently as well. In contrast, a person of ordinary skill in the art would not read this claim as requiring the impossible: that a playback device "simultaneously" plays audio both independently and synchronously in a group. *See* CMIB Ex. 16 at ¶ 56.

The specification also describes the playback devices as having the capability to either play audio independently or to be grouped for synchronized audio playback with other playback devices: "One of the objects, features, and advantages of the present invention is to remotely control a plurality of multimedia players in a multi-zone system, playing and controlling the audio source synchronously if the players are grouped together, or playing and controlling the audio source individually if the players are disassociated with each other." '949 patent at 3:40-45. This concept is further illustrated in Figures 3C, 3D, and 3E. Figure 3C shows that the zone players can

[9] Google does not appear to disagree that the specification is consistent with Sonos' and Staff's reading that playback devices can operate either independently or in groups. Google writes: "[T]he '949 patent proposes a controller with a user interface that allows audio players in a multi-zone system to operate in one of two distinct states – individually or as part of a group." RMIB at 22 (citing '949 patent at 3:40-45); *see also id.* at 23 (explaining that Figure 3C describes "the players as playing 'independently," as well as linked in a group).

play independently (i.e., BEDROOM or DINING ROOM), while Figure 3E shows the zone players as part of groups (i.e., BEDROOM+DINING ROOM+LIVING ROOM+PATIO):

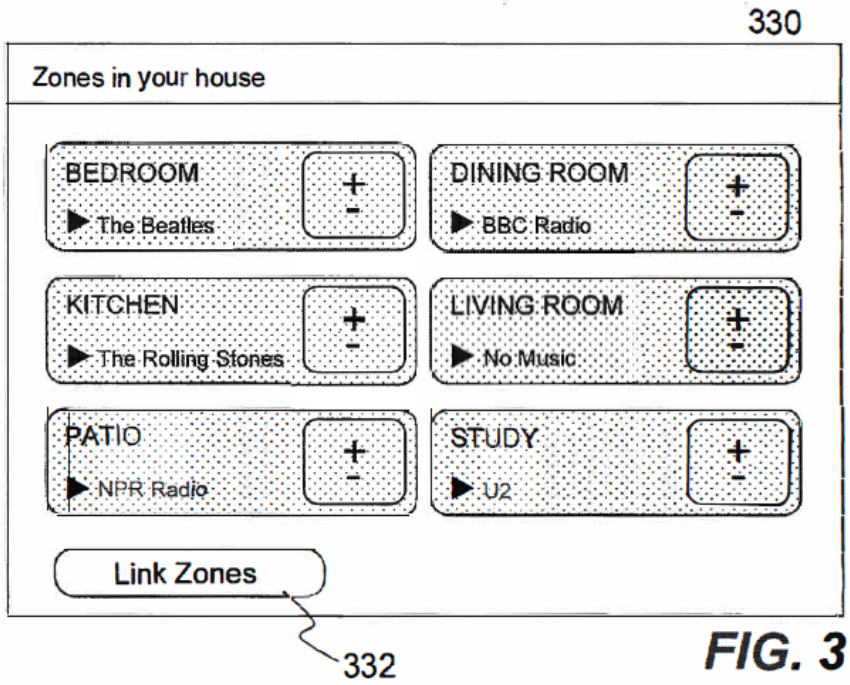

FIG. 3C

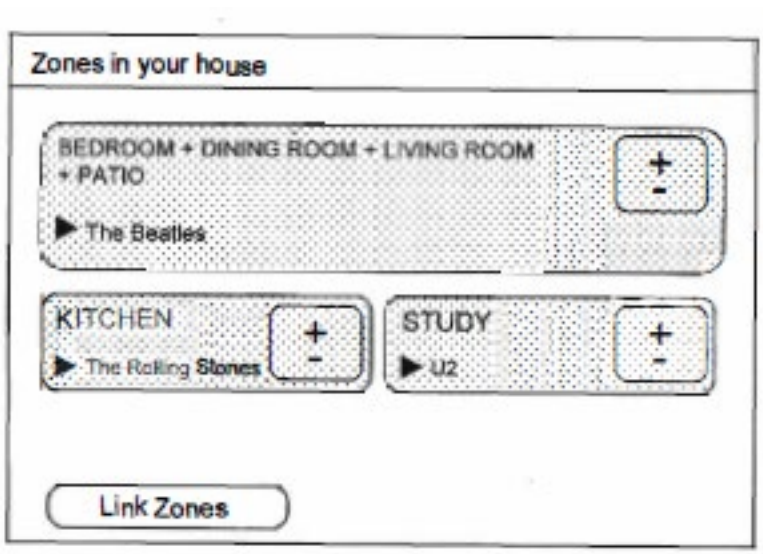

FIG. 3E

The specification explains:

> FIG. **3C** shows an exemplary user interface (UI) **330** to show all available individual zones in a house. Each zone player can play a type of media (such as music, photographs and video) independently. Each zone player in the U1 may be highlighted on the screen using either a touch screen or an input device such as a stylus, a scroll wheel, or arrow buttons. If a user wishes to link players in some rooms together to form a group so that players in these rooms are playing the same media in a synchronized fashion, the user may activate the grouping function by activating "link zones" **332** that leads to a user interface **340** as shown in FIG. 3D.

Id. at 9:49-59. Such descriptions clearly support Sonos' and Staff's understanding that the claims require only that playback devices have the capability of independent play, not that they must simultaneously play media independently and in groups.

Google argues that the prosecution history demonstrates that Sonos' and Staff's understanding is incorrect. Google asserts that "Metcalf and Isley disclose playback devices capable of playing multimedia separately from other players." RMIB at 30. Thus, in Google's view, the addition of the term "independent playback device" must mean something other than the mere capability of playing multimedia separately from other devices.

The evidence does not support the underlying premise of Google's argument. Rather, it shows that the Examiner agreed with Sonos that Metcalf and Isley do not disclose playback devices that are grouped together, but have the capability of independent operation. On April 10, 2013, the Examiner issued a Non-Final Office Action rejecting claims as invalid over Metcalf. CMIB Ex. 16 at *98. In response to this Office Action, Sonos argued that Metcalf "did not disclose or suggest independent playback devices." *Id.* at *117. Sonos therefore suggested adding "independent playback device" as a limitation. *Id.* at *118. The Examiner deemed the addition of this limitation "sufficent [sic] to obviate the anticipation rejections over Metcalf and the obviusness [sic] rejection over Metcalf in view of Aiso." *Id.* at *122-123. Thus, it is clear that the Examiner concluded that Metcalf did not disclose playback devices that can play both independently and in a group.

The record is also clear that the Examiner agreed with Sonos that Isley did not disclose playback devices with the capability of independent operation. During a telephone interview, Sonos "distinguished the individual operation [of the claimed invention] over the tethered or interdependent operation of Isley." *Id.* at *134. In allowing the amended claims, the Examiner noted that, "where Isley controls volume in an interdependent manner[,] the instant application s [sic] teaches the system functional to provide groupwise and individual control of each of the groupwise addressable and independently addressable playback devices." *Id.* at *132. In other words, the Examiner found that Isley controlled volume in an interdependent manner, while the claimed playback devices had both individual and groupwise volume control. The Examiner did not, therefore find, that Isley disclosed the independent operation of the playback devices as claimed in the '949 patent.

Having found that Sonos' and Staff's interpretation of the claim is correct, the undersigned must now choose between the two proposals. Both Sonos and Staff agree that an "independent playback device" is a "data network device configured to process and output audio . . ." JC at 4. Sonos proposes that the audio be "capable of playing multimedia separately from other players," while Staff proposes "audio that is capable of independent operation." *Id.* Staff explains that "the phrase 'independent operation' is taken directly from the Examiner's summary of the interview discussing the 'claimed individual players' as distinct from Isley." SMIB at 34 n.7. The undersigned finds Staff's proposal to be the better one. As noted above, the Examiner appeared to distinguish the claimed invention over Isley because of the capability to control volume individually and not specifically because Isley failed to disclose a capability of playing multimedia

separately from other players. As such, Staff's proposal more accurately reflects the reasons for allowing the amended claim language.[10]

Accordingly, the undersigned hereby construes the term "independent playback device" as "***data network device configured to process and output audio that is capable of independent operation***."

3. '896 patent

a) "security key"

The term "security key" appears in claim 1 of the '896 patent. The parties disagree on the claim construction of this term and have proposed the following constructions:

SONOS	GOOGLE	STAFF
Plain and ordinary meaning; no construction necessary	"a string used in encryption to make data unreadable, or in decryption to render encrypted data readable"	Plain and ordinary meaning; no construction necessary

JC at 2.

Sonos argues that the '896 patent makes clear that "security key" refers to "any information for facilitating access to, or subsequent communication on, a secure network, such as a secure WLAN" but places no limitation on the type of "security key." CMIB at 23 (citing '896 patent, cl. 1). Sonos contends that the specification does not require the "security key" to be used for encryption or decryption. *Id*. at 24 (citing '896 patent at 3:24-29, 3:46-53, 4:12-23, 14:32-35). Moreover, Sonos submits that, when referring to encryption, the specification uses narrower terms like "public key" or "private key." *Id*. at 24-25 (citing '896 patent at 13:21-23, 13:31-32, 13:62-63, 14:59-61, 15:13-32). Sonos also contends that a person of ordinary skill in the art would have understood that the term "security key" would not have been limited to an encryption or decryption

[10] Sonos notes that "Staff's construction and the analysis of this term is consistent with that of Sonos" and that there is no "conflict between the two proposals." CMRB at 15; CMIB at 37 n.9.

key that is in binary format. *Id*. (citing CMIB Ex. 14 at ¶¶ 14-44). Sonos criticizes Google's reliance on cases that do not construe the specific term "security key" at issue in the '896 patent. CMRB at 6 (citing *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1318 (Fed. Cir. 2005)). Sonos contends that the '896 patent is not limited to "encryption" or "decryption" because the '896 claims do not explicitly recite "encryption" and/or "decryption." *Id*. at 6-7 (internal citations omitted). In addition, Sonos argues that, contrary to basic claim construction principles, Google improperly reads a preferred embodiment into the claims. *Id*. at 7-8.

Google argues that the '896 patent teaches that secure communications can be achieved by encrypting information using security keys. RMIB at 43. Google contends that "security key" has a well-accepted plain meaning to those of ordinary skill in the art of being used in encryption or decryption and that courts regularly construe the term to be used to encrypt or decrypt data. *Id*. at 43-44 (citing RMIB Ex. 6 at ¶ 29; case citations omitted). Google argues that the specification equates "security key" and "WEP key" and that "WEP" is a form of cryptography used to make data unreadable using a string of bits referred to as a WEP key. *Id*. at 44 (citing '896 patent at 9:30-35; RMIB Ex. 30 at Appendix p. 3, 8, 9, 14; RMIB Ex. 6 at ¶¶ 51-58; RMIB Ex. 14 at 118:17-119:12, 122:6-8). Google also argues that every instance of "key" in the '896 patent refers to actual strings of bits that encrypt or decrypt data. *Id*. at 45 (citing '896 patent at 13:21-23, 13:31-32, 13:62-63, 15:26-27; RMIB Ex. 30 at Appendix p. 8, 10; RMIB Ex. 6 at ¶¶ 48-49). In addition, Google submits that numerous dictionary definitions support its proposed construction and verify that it is consistent with the intrinsic record. *Id*. at 46 (citing RMIB Ex. 31; RMIB Ex. 6 at ¶ 70). Google argues that claim 1 distinguishes the claimed "security key for the secure WLAN" from "an identifier of the secure WLAN" and Sonos' interpretation of "security key" deletes the word

"key" from the claims and erases the distinction between different types of information in the specification and claim. *Id*. at 47.

Staff agrees with Sonos that this term should be given its plain and ordinary meaning. SMIB at 39. According to Staff, Google improperly imports limitations into the claims because the claim language places no limitation on the format of the security key nor limits its use to encryption or decryption. *Id*. (citing '896 patent at cl. 1; *Phillips*, 415 F.3d at 1323). Moreover, Staff argues that Google is improperly reading an embodiment into the claims as a limitation. *Id*. at 39-40 (citing '896 patent at 3:11-4:24, 14:32-35, 9:28-41; RMIB at 44; *Tate*, 222 F.3d at 966). Staff also claims that Google is attempting to encompass all instances of the word "key" in the specification in its proposed construction of "security key," contrary to the specification's use of different terms. *Id*. at 40 (citing '896 patent at 12:21-23, 13:31-32, 13:62-63, 15:26-27; RMIB at 45-46). In addition, Staff argues that Google's extrinsic evidence "fails to address how a POSITA would have understood the term at issue." *Id*. at 41. Rather, Staff contends that various technical dictionary definitions of "security key" support the position that a person of ordinary skill in the art would have understood the term to be "broader than just keys in binary format used for encryption and decryption." *Id*. (citing CMIB at 26-27; CMIB Ex. 9 at ¶¶ 22-24).

The central dispute is whether the term "security key" should be limited to encryption or decryption. Claim 1 recites "a security key for the secure WLAN." '896 patent, cl. 1. Thus, as an initial matter, the claim language itself does not limit "security key" to any particular format or limit its use to encryption or decryption. *See id*.; *Phillips*, 415 F.3d at 1312, 1314. While the specification describes "WEP keys" as "wired equivalent privacy, or simply security keys" that is only with respect to one embodiment. *See* '896 patent at 9:28-35. Therefore, although the '896 patent discloses a "WEP key" that may be used for encryption, it does not necessarily follow that

the "security key" must be used for encryption. Instead, it would be improper to read a limitation from a particular embodiment into the claims. *See Tate Access Floors*, 222. F.3d at 966 ("Although claims must be read in light of the specification of which they are a part, it is improper to read limitations from the written description into a claim."). Moreover, when describing encryption, the specification uses other terms such as "public key" or "private key" instead of "security key." *See, e.g.*, '896 patent at 13:21-23, 13:31-32, 13:62-63, 14:56-61, 15:13-30. Thus, the intrinsic evidence does not support limiting the term "security key" to encryption or decryption.

The undersigned also finds that the extrinsic evidence does not support Google's proposed construction. Google relies on dictionary definitions for "key" and not "security key." *See* RMIB at 46; RMIB Ex. 31; RMIB Ex. 6 at ¶ 70. In addition, some of the extrinsic evidence suggests that one of ordinary skill in the art would have understood the term "security key" to be broader than just keys used for encryption or decryption. *See* CMIB Ex. 14 at ¶¶ 22-24. Moreover, the undersigned is not persuaded by Google's reliance on constructions of terms used in patents unrelated to the '896 patent, especially when they are not the same as the term at issue (*e.g.*, "key," "key information," "cryptographic key"). *See* RMIB at 43-44; *Tristrata, Inc. v. Microsoft Corp.*, 11-cv-03797-JST, 2013 WL 5645984, at *10 (N.D. Cal. Oct. 16, 2013); *Advanced Software Design Corp. v. Fiserv, Inc.*, 641 F.3d 1368, 1377 (Fed. Cir. 2011); *Achates Reference Pub., Inc. v. Symantec Corp.*, 2:11-cv-294-JRG-RSP, 2013 WL 2357172, at *10 (E.D. Tex. Jan. 3, 2013); *Walker Digital, LLC v. Google, Inc.*, 66 F. Supp. 3d 501, 513 (D. Del. 2014).

Accordingly, the undersigned hereby construes the term "security key" according to its plain and ordinary meaning.

b) "while operating . . ." and "after receiving . . ."

The terms "while operating . . ." and "after receiving . . ." appear in claim 1 of the '896 patent. The parties disagree on the claim construction of these terms and have proposed the following constructions:

CLAIM TERMS	SONOS/STAFF	GOOGLE
"while operating on a secure wireless local area network (WLAN) that is defined by an access point, (a) receiving, via a graphical user interface (GUI) associated with an application for controlling one or more playback devices, user input indicating that a user wishes to set up a playback device to operate on the secure WLAN and (b) receiving a first message indicating that a given playback device is available for setup; after receiving the user input and receiving the first message, transmitting a response to the first message that facilitates establishing an initial communication path with the given playback device, wherein the initial communication path with the given playback device does not traverse the access point"	Plain and ordinary meaning; no construction necessary	"while operating on a secure wireless local area network (WLAN) that is defined by an access point, (a) receiving, via a graphical user interface (GUI) associated with an application for controlling one or more playback devices, user input indicating that a user wishes to set up a playback device to operate on the secure WLAN and (b) receiving a first message indicating that a given playback device is available for setup" ***must happen before*** "after receiving the user input and receiving the first message, transmitting a response to the first message that facilitates establishing an initial communication path with the given playback device, wherein the initial communication path with the given playback device does not traverse the access point"[11]

JC at 3.

Sonos submits that a construction is not necessary for these terms because the meaning is readily apparent from the claim language. CMIB at 28. Sonos argues that Google improperly adds

[11] Google submits that it has "no objection to a construction requiring that 1[g] happens *after* 1[f], to the extent that the CALJ prefers using 'after' instead of 'before.'" RMRB at 16. Google also seems amenable to a "formal construction or a finding that the plain meaning includes an order of steps." *Id*. at 16-17.

an unnecessary limitation that the "receiving" functions must happen before the "transmitting" function. *Id*. at 29. Sonos contends that this is improper because the claim language is clear on its face and the specification does not deviate from the clear language of the claims. *Id*.; CMRB at 12 (citing *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 863 (Fed. Cir. 2004); *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997)). In addition, Sonos argues that Google's proposed construction "runs the risk of improperly importing a limitation into the claims that requires the claimed 'receiving' functions to actually 'happen,' *i.e.*, be performed by the 'computer device.'" CMRB at 12. Sonos submits this would be incorrect because the '896 patent covers a "computing device" that is merely capable of performing the claimed "receiving" functions and does not require their actual performance. *Id*.

Google submits that the claim language requires an "order of the steps" such that the computing device be configured to perform the "transmitting a response to the first message" step "after receiving the user input and receiving the first message" steps. RMIB at 35. According to Google, the specification confirms this "order of steps." *Id*. at 36 (citing '896 patent at Fig 3B, 13:43-14:17, 12:67-13:4). Google therefore requests adoption of its proposed construction "[t]o remove any doubt and potential for confusion." *Id*. at 37; *see also* RMRB at 17 (citing *Oak Tech., Inc. v. Int'l Trade Comm'n*, 248 F.3d 1316, 1324 (Fed. Cir. 2001)).

Staff asserts that Google has not explained why its construction is necessary nor how it differs from the clear language of the claim. SMIB at 43-44. Therefore, Staff contends that because the claim language is clear on its face and the specification does not deviate from the clear language of the claims, Google's proposed construction should be rejected and these terms should be given their plain and ordinary meaning. *Id*. at 44.

It is clear that the plain language of these terms requires a sequence of steps – first, receiving user input and a first message that a given playback device is available for setup, and then, transmitting a response to the first message that facilitates establishing an initial communication path with the given playback device. *See* '896 patent, cl. 1; *TALtech Ltd. v. Esquel Apparel, Inc.*, 279 Fed. Appx. 974, 978 (Fed. Cir. 2008) (citing *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369-70 (Fed. Cir. 2003)) ("[W]e we will find that the claim requires an ordering of steps when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires such a narrow construction."). Moreover, the specification does not deviate from the plain language of the claims. *See* '896 patent at 12:63-14:17, Fig. 3B. The undersigned, however, finds that Google's proposed construction would be improperly narrow. As discussed below with respect to the "program instructions" term, infringement occurs when one makes, uses, offers to sell, or sells the claimed system. It would therefore not make sense to require that any step "must happen." *See infra* at Section VI.B.3.c. Rather, claim 1 recites a processor and program instructions stored on a computer-readable medium that are executed by the processor, making it capable of performing the claimed functions. *See id.*; '896 patent, cl. 1.

Accordingly, the undersigned hereby construes the terms "while operating . . ." and "after receiving . . ." according to their plain and ordinary meaning, which includes a sequence of steps.

c) "program instructions . . ."

The term "program instructions stored on the non-transitory computer-readable medium that . . ." appears in claim 1 of the '896 patent. The parties disagree on the claim construction of this term and have proposed the following constructions:

CLAIM TERM	SONOS/STAFF	GOOGLE
"program instructions stored on the non-transitory computer-readable medium that, when executed by the at least one processor, cause the computing device to perform functions comprising: while operating on a secure wireless local area network (WLAN) that is defined by an access point, (a) receiving, via a graphical user interface (GUI) associated with an application for controlling one or more playback devices, user input indicating that a user wishes to set up a playback device to operate on the secure WLAN and (b) receiving a first message indicating that a given playback device is available for setup"	Plain and ordinary meaning; no construction necessary	Indefinite

JC at 3.

Sonos asserts that no construction is necessary because the meaning of this term is readily apparent from the claim language. CMIB at 30. Sonos argues that the claim language does not require a person of ordinary skill in the art to make any subjective determination about the mental state of the user providing the "user input," but rather, that the "user input" of a particular type is received. *Id*. at 31. Therefore, Sonos contends that the claim language is clear that the "computing device" is operable to receive a particular type of "user input," which provides an objectively verifiable indication to a person of ordinary skill in the art. *Id*. Moreover, Sonos submits that the specification confirms that the claimed functionality of receiving "user input" does not depend on

any subjective opinion of a user, just that the "user input" of a particular type is received. *Id*. (citing '896 patent at 12:59-62, 16:21-24, 12:25-30, 15:65-16:4, 12:67-13:3); CMRB at 9-10 ("the claims clearly cover a 'computing device' with the ***capability*** to perform the recited functions"). Sonos contests Google's reliance on cases where the claims explicitly require user action. CMRB at 11.

Google asserts that these claim terms improperly combine system claim limitations with a method claim limitation. RMIB at 38; RMRB at 17-18. Google therefore argues that "claim 1 is indefinite because it is unclear if the alleged infringement occurs when the device is first created with 'program instructions' or only when those instructions are executed when using the device 'while operating on a secure wireless local area network (WLAN).'" RMIB at 38 (citing *IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005); *Certain Unmanned Aerial Vehicles & Components Thereof*, Inv. No. 337-TA-1133, Order No. 15 (Jun. 21, 2019)). According to Google, the "while operating on a secure wireless local area network (WLAN)" language describes a state of the computing device during actual use. *Id*. at 38-39 (citing '896 patent at 14:1-14). Thus, Google argues that it is not enough to show that the "computing device" is capable of "operating on a secure wireless local area network (WLAN)." *Id*. at 39. Rather, Google contends that the claim requires showing that the "computing device" is "operating on a secure wireless local area network (WLAN)." *Id*. Google therefore asserts that claim 1 and its dependent claims are indefinite because it is unclear whether infringement occurs when one creates the system or when the user actually uses the system. *Id*. (citing *IPXL Holdings*, 430 F.3d at 1384).

Staff argues that like other computer-readable medium claims, claim 1 defines the "computer-readable medium" in terms of the functions it enables the "computing device" to perform. SMIB at 45 (citing *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995)). According to Staff, the Federal Circuit made clear in *Finjan* that such claims are infringed when one makes, uses,

offers to sell, or sells the claimed apparatus, even if the claimed code is not executed. *Id*. at 45-46 (citing *Finjan v. Secure Computing Corp.*, 626 F.3d 1197, 1203-05 (Fed. Cir. 2010)). Staff contends that the phrase "while operating on a secure wireless local area network (WLAN)" is merely describing the functions the claimed "computer-readable medium" enables the "computing device" to perform. *Id*. at 46. Therefore, Staff argues that because infringement of such a claim occurs without actual use of the device, the phrase does not require an activity to be performed by the user. *Id*.

The undersigned finds Google's arguments unconvincing. In *IPXL Holdings*, the claim that was found to be invalid recited both a system and the method for using that system, and did not apprise a person of ordinary skill in the art of its scope. *See IPXL Holdings*, 430 F.3d at 1384. However, "[t]he conclusion of *IPXL Holdings* was based on the lack of clarity as to when the mixed subject matter claim would be infringed." *Microprocessor Enhancement Corp. v. Texas Instruments Inc.*, 520 F.3d 1367, 1374 (Fed. Cir. 2008) (citing *IPXL Holdings*, 430 F.3d at 1384). In contrast, a claim clearly limited to a processor possessing the recited structure and capable of performing the recited functions is not indefinite under *IPXL Holdings*. *See id*. at 1375. Here, claim 1 of the '896 patent recites a processor and program instructions stored on a computer-readable medium that are executed by the processor, making it capable of performing the claimed functions. *See* '896 patent, cl. 1. Therefore, unlike the claims in *IPXL Holdings*, claim 1 uses permissible functional language to describe the capabilities of the claimed system and it is clear that infringement occurs when one makes, uses, offers to sell, or sells the claimed system. *See id*.; *MasterMine Software, Inc. v. Microsoft Corp.*, 874 F.3d 1307, 1316 (Fed. Cir. 2017). Because claim 1 informs one of skill in the art about the scope of the invention with reasonable certainty, the undersigned finds that Google has not proven that it is invalid as indefinite.

Accordingly, the undersigned hereby construes the term "program instructions stored on the non-transitory computer-readable medium that . . ." according to its plain and ordinary meaning.

d) "at least a second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN"

The term "at least a second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN" appears in claim 1 of the '896 patent. The parties disagree on the claim construction of this term and have proposed the following constructions:

SONOS	GOOGLE	STAFF
one or more additional messages that collectively contain an identifier of the secure WLAN and a security	at least one second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN[12]	Plain and ordinary meaning; no construction necessary[13]

JC at 4.

Sonos argues that the two "network configuration parameters" (*i.e.*, the secure WLAN identifier and the security key) are sent in "one or more additional messages" that collectively contain such parameters. CMIB at 33. Sonos argues that Google's proposed construction "impermissibly vitiates the claim language 'at least'" because there would be no reason to have any other messages beyond the second message since they would be redundant. *Id.*; CMRB at 12-

[12] Google would not object to Staff's proposed construction of plain meaning "as long as the CALJ also finds that Sonos' construction is inconsistent with plain and ordinary meaning in order to better address the parties' current dispute." RMRB at 18.

[13] While Staff submits that this term should be given its plain and ordinary meaning, Staff would not object to Google's proposed construction. SMIB at 47. Staff, however, contends that Sonos' proposed construction is inconsistent with the plain meaning of the claim language and should be rejected. *Id.*

13. Sonos contends that claims should be interpreted so that no term becomes meaningless or superfluous. CMIB at 33-34 (citing *In re Power Integrations, Inc.*, 884 F.3d 1370, 1376 (Fed. Cir. 2018); *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950-51 (Fed. Cir. 2006); *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005). In addition, Sonos submits that the specification confirms that the "at least a second message" is not limited to a single second message and nothing in the specification requires the "network configuration parameters" to be transmitted in a single message. *Id*. at 35-36 (citing '896 patent at 2:45-47, 3:24-30, 3:46-54, 4:17-24); CMRB at 13-14. Sonos contends that Google's and Staff's reliance on *TiVo* is misplaced because "the language of the '896 patent claims does not recite that the 'identifier' and 'security key' are 'assembled' into a single message or otherwise clearly indicate that these two network configuration parameters must be transmitted in a single message." *Id*. at 14-15 (citing *TiVo, Inc. v. EchoStar Commc'ns Corp.*, 516 F.3d 1290, 1303 (Fed. Cir. 2008); *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008)).

Google argues that the plain meaning of the claims requires a least one message containing both the "identifier" and the "security key." RMIB at 40-41 (citing '896 patent, cl. 1; *TiVo*, 516 F.3d at 1303; *CoStar Realty Info., Inc. v. CIVIX-DDI, LLC*, No. 12 C 4968, 12 C 7091 & 12 C 8632, 2013 WL 5346440, at *5 (N.D. Ill. Sept. 23, 2013)); RMRB at 18. According to Google, the only message disclosed by the specification that transmits network configuration parameters from the claimed "computing device" to the "playback device" is a single message that includes both the "identifier" and the "security key" (*i.e.*, the "SetNetParams" message). RMIB at 42 (citing '896 patent at 13:29-37, Fig. 3B, 14:15-17). Google notes that the specification lacks any embodiments where the "identifier" and "security key" are split into separate messages to be transmitted from the "computer device" to the "playback device." *Id*. at 42; RMRB at 19. Google argues that the

specification's discussion of "several messages" refers to the entire process of connecting a playback device to a secure WLAN and does not disclose breaking up the claimed "second message" into multiple messages. RMRB at 19 (citing '896 patent at Fig. 3B). Google contends that it is not ignoring the "at least" language because the '896 patent contemplates sending more than one "second message" with both the identifier and security key. *Id*. at 20 (citing '896 patent at 13:38-41, Fig. 3B; SMIB at 48).

Staff asserts that the meaning of the term is readily apparent from the claim language and that the plain meaning of the term requires that each second message contain the network configuration parameters. SMIB at 48 (citing '896 patent, cl. 1; *Phillips*, 415 F.3d at 1316; *CoStar Realty Info.*, 2013 WL 5346440, at *6; *TiVo*, 516 F.3d at 1303. In addition, Staff submits that the plain language of the claims allows the second message to contain additional information beyond the "network configuration parameters" and thus, the "at least a second message containing network configuration parameters" claim language is not meaningless nor superfluous. *Id*. at 48-49 (citing '896 patent, cl. 10). Staff also asserts that the specification supports its proposed construction by describing an "automatic configuration process" that causes several messages to be exchanged between devices wherein "some of the messages carry information pertaining to a transmission channel, an identifier of the network and a security key for subsequent communication, [and] at least some of the messages are encrypted." *Id*. at 49 (citing '896 patent at 3:11-4:24). According to Staff, the specification discloses the "SetNetParams" message – a single message – that contains both an identifier and a security key. *Id*. at 49-50 (citing '896 patent at Fig. 3B, 13:4-42, 13:29-37, 14:15-17).

The central issue is whether this term requires the "network configuration parameters" (*i.e.*, the "identifier" and the "security key") to be transmitted in one message. Claim 1 recites "at least

a second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN." '896 patent, cl. 1. Thus, as an initial matter, the claim language itself makes clear that "at least a second message" has the network configuration parameters and that the network configuration parameters include both "an identifier of the secure WLAN" and "a security key for the secure WLAN." *See id.*; *Phillips*, 415 F.3d at 1312, 1314; *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501 (Fed. Cir. 1997) ("'Comprising' is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim."). The specification also supports this understanding and discloses a "SetNetParams" message, which is a type of command message sent from the CP (*i.e.*, the control point function provided by a computer or handheld controller) to the ZP (*i.e.*, zone player). '896 patent at 13:29-37. That "SetNetParams" message includes "netConfig," which "includes the new configuration parameters" such as the "identifier" and "security key." *See id.* at Fig. 3B, 13:4-14:17, cl. 1. The specification therefore supports a construction where the second message includes both the identifier and the security key. The undersigned disagrees with Sonos that Google's and Staff's proposed constructions would render the "at least" language in the claim meaningless. As used in claim 1, the words "at least" refer to "a second message." *Id*. at cl. 1. Claim 1 therefore contemplates transmitting more than one "second message" containing network configuration parameters. *See id*. at cl. 1, 3:11-4:24 (specification describing several embodiments encompassing an "automatic configuration process" that causes "several messages to be exchanged" between devices wherein "some of the messages carry information pertaining to an appropriate transmission channel, an identifier of the network and a security key for subsequent communication").

Accordingly, the undersigned hereby construes the term "at least a second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN" as "***at least one second message containing network configuration parameters, wherein the network configuration parameters comprise an identifier of the secure WLAN and a security key for the secure WLAN***."

4. '959 patent

a) "equalization [of the audio data]"

The term "equalization [of the audio data] appears in independent claims 5, 9, and 10 of the '959 patent. The parties disagree on the proper claim construction and have proposed the following constructions:

SONOS	GOOGLE	STAFF
"modifying the output audio data by performing one or more of the following: adjusting one or more parameters related to speaker drivers, such as gain, frequency response, channel output, phase, or time delay; adjusting amplifier gain of the playback device; or using one or more filters"	"alteration of the relative strength of certain frequency ranges in the audio data by performing one or more of the following: adjusting one or more parameters related to speaker drivers, such as gain, frequency response, channel output, phase, or time delay; adjusting amplifier gain of the playback device; or using one or more filters"	"modifying the output audio data by performing one or more of the following: adjusting one or more parameters related to speaker drivers, such as gain, frequency response, channel output, phase, or time delay; adjusting amplifier gain of the playback device; or using one or more filters" ***or alternatively*** "modifying the audio data by performing one or more of the following: adjusting one or more parameters related to speaker drivers, such as gain, frequency response, channel output, phase, or time delay; adjusting amplifier gain of the playback device; or using one or more filters"

JC at 5.

Sonos asserts that the intrinsic evidence supports its proposed construction. According to Sonos, "[b]y repeated use of non-limiting language . . . the '959 Patent makes clear that the inventors intended for 'equalization of the audio data' to have broad scope and that no particular one of the listed functions was required." *Id*. at 47. Sonos notes that its proposed construction is the construction adopted by the district court in Sonos' litigation against D&M Holdings Inc., where the court rejected a construction that focused on frequency as "too narrow." CMIB at 44-45 (citing *Sonos, Inc. v. D&M Holdings, Inc. et al.*, No. 1:14-CV-01330-RGA, 2017 WL 123456 (D. Del. Jan. 12, 2017) ("the *Denon*" litigation)). Sonos submits that Google's dictionary driven construction should also similarly be rejected as improperly restrictive. CMIB at 46; CMRB at 20-24. Staff concurs with Sonos' proposed construction.[14] SMIB at 15-20.

Google submits that the claim language, specification, and the understanding of persons skilled in the art confirm that its proposal is correct. RMIB at 11-17; RMRB at 4-8. Google explains: "Contrary to Sonos' proposed construction, the specification does not use the term 'equalization' to describe any 'modification' to audio data performed by adjusting parameters related to a speaker driver, such as amplifier gain or channel output." RMIB at 11. Thus, Google argues that by defining "equalization" to include these other modifications, Sonos' and Staff's proposed construction effectively reads the "equalization" requirement out of the claims. *Id*. Google also contends that Sonos' construction should be rejected because it replaces the claim

[14] As noted, Google objects to Sonos' proposal because of its usage of the term "output audio data." RMIB at 18. Staff does not agree that the use of this term renders the claims ambiguous. SMIB at 20. However, to the extent the undersigned agrees that the *Denon* court's construction creates ambiguity, Staff submits that "an appropriate solution would be to construe 'equalization [of the audio data]' as 'modifying ***the audio data*** by performing one or more of the following: adjusting one or more parameters related to speaker drivers, such as gain, frequency response, channel output, phase, or time delay; adjusting amplifier gain of the playback device; or using one or more filters.'" *Id*. (emphasis in original).

term "audio data" with the term "output audio data," and a result, renders the claims ambiguous. RMIB at 18; RMRB at 9.

The parties agree that the specification describes various techniques that could be used to perform equalization of audio data. CMIB at 44; SMIB at 15-16; RMIB at 10. This is reflected in the parties' proposed constructions and include adjusting the gain or channel output of speaker drivers, adjusting amplifier gain of the playback device, and applying one or more filters to the audio data. JC at 5. The parties' dispute centers on whether "equalization of audio data" covers any "modifying the output audio data[15]," as Sonos and Staff propose[16], or whether these techniques must be performed in a way that alters the relative strength of certain frequency ranges in the audio data, as Google contends.

The undersigned finds Google's proposal to be consistent with the intrinsic evidence and the accepted meaning of "equalization" to persons of ordinary skill in the art. "Equalization" is a well-known technique that allows one to emphasize or diminish a specific range of frequencies.[17] RMIB Ex. 7 at ¶¶ 36-37; *see also* RMIB Ex. 33-36. As Dr. Jeffay, Google's expert explained: "High-frequency ranges can be increased relative to mid- and low-frequency ranges in order to introduce more treble into the audio signal. Or low-frequency ranges can be increased relative to high- and mid-frequency ranges to introduce more bass into the audio signal. The key to equalization is altering the relative strength of signals within certain frequency ranges in the audio data." *Id*. at ¶ 37.

---

[15] Sonos's proposed construction adds in the word "output" before "audio data." JC at 5. Sonos did not address this portion of its construction in its initial briefing. *See generally* CMIB at 44-48. However, in its reply brief, Sonos stated that it "has no objection to dropping the word 'output' if the CALJ believes that this would help clarify the construction." CMRB at 19 n.11.

[16] As discussed above, Sonos' and Staff's proposals mirror the construction adopted by the *Denon* court in Sonos' litigation against D&M Holdings Inc. CMIB at 44-45; SMIB at 18-20. Google was not a party to that litigation. The undersigned notes that while the *Denon* court's decision is informative, it is not binding on the Commission.

[17] Neither Sonos nor Staff appear to dispute that "equalization" has a well-known meaning to persons of ordinary skill in the art, at least outside the context of the patent itself. *See generally* CMIB at 44-48; SMIB at 15-20.

The specification similarly describes "equalization" in terms of frequency ranges of audio signals. *See, e.g.*, '959 patent at 8:28-39, 12:15-16; 14:29-32; 16:20-23; 16:48-59. For example, when describing the Sonos S5 device, the specification explains that when two sets of drivers have the "same equalization," those drivers have the "same frequencies." *Id*. at 8:28-39 ("Further, both mid-range drivers and both tweeters have the same equalization (or substantially the same equalization). That is, they are both sent the same frequencies, just from different channels of audio."); *see also* 16:28-33 (describing examples of adjusting the strengths of frequencies including strengths of frequencies within the audio data and by applying filters). This passage confirms that merely adjusting channel output (*e.g.*, switching between left-channel and right-channel audio) does not necessarily change the equalization of audio data, if the adjustment/switch does not affect the frequency ranges in the audio data. *See* RMIB Ex. 7 at ¶ 67 ("A person of ordinary skill in the art would understand that, in order to equalize the audio data, the channel output must be adjusted in a way that alters the relative strength of frequency ranges in the audio data."); *see also id.* at ¶¶ 53-55, 67. The specification also explains that equalization can be used to reduce interference by turning off specific drivers within a playback device. '959 patent at 16:48-59 ("In addition, the equalization of each S5 device is changed in an attempt to reduce or eliminate certain constructive or destructive interference. For example, one tweeter on each S5 device may be turned off or substantially muted."). It describes an embodiment where two S5 devices are used to form a stereo pair: "In this configuration, for example, the left and right audio data may be sent to both S5 devices, but the left audio data of the track is played out of the S5 device configured as left and the right audio data of a track is played out of the S5 device configured as right." *Id.* at 16:52-56. Such a configuration may lead to interference due to overlapping frequency ranges output from the two devices. *Id*. at 16:56-59. The patent then

explains that equalization of each device may be changed to account for the interference. *Id*. A person of ordinary skill in the art would understand that in this context, equalization refers to "reducing the relative strength of frequency ranges likely to cause interference." RMIB Ex. 7 at ¶ 56. In addition, the specification describes equalization in terms of adjusting bass and treble. '959 patent at 12:15-16 ("Set the music playback equalization of each zone (e.g., bass treble)). As Dr. Jeffay explained, a person of ordinary skill in the art would understand that bass refers to low frequency ranges, while treble refers to high frequency ranges. RMIB Ex. 7 at ¶ 57. Thus, when the specification discusses setting the playback equalization of a zone, it refers to adjusting the strength of high and low frequencies with that zone. *Id*. Based on these disclosures, the undersigned finds that the patentee used the term "equalization" in accordance with its accepted meaning in the art, which is adjusting the relative strength of frequency ranges in the audio data.[18]

The prior art cited during prosecution supports this conclusion. For example, Isley explains that "[e]qualization typically involves controlling the amplification or volume of individual frequency ranges of an audio output." RMIB Ex. 15 at [0006]. Likewise, U.S. Patent Publication No. 2005/0100174 ("Howard") explains that "[e]qualization signal processing operations, whether implemented in the digital or analog domain, should be designed to provide a smoother frequency response of the audio system in each mode of play as compared to the frequency response of the system with no equalization." RMIB Ex. 16 at [0064]. Both Isley and Howard confirm that

[18] The extrinsic evidence also shows that a person of ordinary skill in the art would understand that "equalization" refers to altering the strength of frequency ranges in audio data. *See, e.g.,* RMIB Ex. 33-36. For example, the Audio Dictionary describes equalization as follows: "An equalizer, contrary to what its name implies, alters or distorts the relative strength of certain FREQUENCY ranges of an audio SIGNAL." RMIB Ex. 33 at 139. Likewise, the *Modern Dictionary of Electronics* describes equalization as: "Reshaping the playback characteristics of a recording during playback mode. The simplest way is to adjust the treble and bass controls, but true equalization requires continuous adjustment of the playback frequency response curve at several points. A graphic equalizer is often used for this." RMIB Ex. 34 at 262. And *Webster's New World Dictionary of Media and Communications* defines it as "the process of altering the frequency response of an audio signal, as with a tone control or other device (equalizer)." RMIB Ex. 35 at 213.

equalization describes the relative strength of frequency ranges in audio data. RMIB Ex. 7 at ¶¶ 58-59.

Sonos and Staff contend that the asserted claims of the '959 patent each require a "playback device" that is operable to "configure [itself] to perform a [first/second] ***equalization of the audio data*** before outputting audio based on the audio data from the [playback device's] plurality of speaker drivers when the [playback device's] type of pairing is determined to comprises [a first/second] type of pairing." CMIB at 45 (citing '959 patent, cl. 10) (emphasis in original); SMIB at 16. They therefore submit that the plain language of the claims supports their construction of equalization as "modifying the output audio data." CMIB at 45-46; SMIB at 16-17. The undersigned disagrees. Claim 5 recites, in relevant part: "wherein in the first type of pairing, the playback device is configured to output audio comprising two channel sound via the plurality of speaker drivers, and wherein in the second type of pairing, the playback device is configured to output audio comprising no more than one channel of the two channel sound via the plurality of speaker drivers, … ." '959 patent, cl. 5. Claim 5 then describes performing a "first equalization" and a "second equalization" of the audio data. *Id*. Thus, contrary to Sonos' and Staff's assertion that equalization includes any type of modification, the claim language clearly distinguishes equalization from other types of modifications such as switching from two-channel to one-channel sound (*i.e.*, changing channel output). Furthermore, the fact that dependent claims 2, 26, and 34 use the phrases "equalization [of the audio data]" <u>and</u> "modify the audio data" strongly suggests that the patentees intended for these terms to have different meanings.[19] *See SimpleAir, Inc. v.*

[19] Sonos argues that dependent claims 2, 24, and 36 support its construction because they specify that "performing the first equalization comprises using a first type of pass filter to modify the audio data before outputting audio based on the audio data." CMIB at 45. Sonos believes that this language shows that equalization "involves modifying the audio data." *Id.* There is no dispute that equalization involves modifying audio data. The question is whether equalization covers *all* forms of modifying audio data, even modifications that do not alter the relative strength of frequency ranges. Contrary to Sonos' contention, the dependent claims actually support Google's proposal. These claims specify that

Sony Ericsson Mobile Commc'ns AB, 820 F.3d 419, 431 (Fed. Cir. Cir. 2016); *Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.,* 533 F.3d 1362, 1371 (Fed. Cir. 2008) ("Different claim terms are presumed to have different meanings.") (citation omitted).

Nor is the undersigned persuaded by Sonos' and Staff's argument that the specification's use of non-limiting language like "might" and "may" indicates that the inventors meant for "equalization of the audio data" to have broad scope. CMIB at 47; SMIB at 18. Sonos and Staff cite to the following passages from the specification in support:

> Changing the equalization of the playback device might include any of: turning on or off (or effectively muting) one or more specific speaker drivers, changing the channel output of one or more speaker drivers, changing the frequency response of one or more specific speaker drivers, changing the amplifier gain of any particular speaker driver, changing the amplifier gain of the playback device as a whole.

'959 Patent at 16:20-27.

> In certain embodiments, changing the equalization of a playback device (e.g., changing the equalization of one or more speaker drivers of the playback device) may affect frequency dependent parameters. Examples might include the adjustment of the strength of frequencies within the audio data, a phase adjustment, and time-delay adjustment. In addition, a particular equalization may use a first type of pass filter, such as one that attenuates high, middle, or low frequencies, for example, while allowing other frequencies to pass unfiltered (or substantially unfiltered).

Id. at 16:28-47. However, these passages describe equalization of *the playback device*, not the audio data as recited in the claims. Sonos' and Staff's argument therefore presumes that the inventors equated equalization of the playback device to equalization of the audio data. The undersigned does not believe the specification is clear on this. What is clear is that these sections do not broadly define or characterize equalization as "modifying the output audio data," as Sonos and Staff suggest. Using non-limiting language is not enough to overcome the presumption that

---

equalization is accomplished through use of a pass filter, which a person of ordinary skill in the art would understand is one mechanism for altering the relative strength of frequency ranges in audio data. RMIB Ex. 7 at ¶ 38.

the plain and ordinary meaning of "equalization" applies. As Google notes, "[t]o act as its own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plan and ordinary meaning." *Thorner v. Sony Comp. Entm't Amer. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012). In addition, the cited sections appear to identify different techniques that ***might*** be used to perform equalization of audio data. For example, they could be used to perform other modifications – such as volume adjustments[20] – which the specification distinguishes from equalization. '959 patent at 12:10-11.[21] As Dr. Jeffay explained at length in his declaration, a person of ordinary skill in the art would understand that these techniques do not necessarily result in equalization of the audio data, but rather that they must be performed in a way that actually alters the relative strength of frequency ranges in the audio data. RMIB Ex. 7 at ¶¶ 65-78.

For these reasons, the undersigned hereby construes the term "equalization [of the audio data]" as "***alteration of the relative strength of certain frequency ranges in the audio data by performing one or more of the following: adjusting one or more parameters related to speaker drivers, such as gain, frequency response, channel output, phase, or time delay; adjusting amplifier gain of the playback device; or using one or more filters***."

b) "type of pairing" / "first type of pairing" / "second type of pairing"

The terms "type of pairing," "first type of pairing," and "second type of pairing" appear in independent claims 5, 9, and 10 of the '959 patent. The parties disagree on the proper claim construction and have proposed the following constructions:

[20] Under Sonos' and Staff's construction, equalization would occur any time one or more speaker drivers are muted or turned off, any time the gain of an individual driver is adjusted, or any time audio data is modified by adjusting channel output. Their interpretation conflates equalization with any modification that results from performing techniques like adjusting driver gain or channel output and essentially reads out "equalization" from the claims. *See Power Mosfet Techs., L.L.C. v. Siemens AG,* 378 F.3d 1396, 1410 (Fed. Cir. 2004) ("[I]nterpretations that render some portion of the claim language superfluous are disfavored.").

[21] This distinction is further evidence that the patentee did not intend for "equalization" to encompass ***any*** modification of the audio data.

SONOS	GOOGLE	STAFF
A "type of pairing" can be either a pairing configuration involving two or more playback devices that have different playback roles, such as a stereo pair or home theater configuration, or a 'no pairing' in which the playback device is not part of a pairing configuration involving two or more playback devices	The term "pairing" means "configuration involving two or more playback devices that have different playback roles." The terms "type", "first type", and "second type" should have their plain and ordinary meaning.	Plain and ordinary meaning; no construction necessary

JC at 6.

The parties have agreed that the term "pairing" means a "configuration involving two or more playback devices that have different playback roles." *See* Section VI.A; JC at 2. Nor do they contest the meaning of the terms "type," "first type," and "second type." *See generally* CMIB at 48-50; CMRB at 24-25; RMIB at 19-21; RMRB at 10-11; SMIB at 21-22. Rather, the parties' disagreement centers on whether a "no pairing" is a "type of pairing." CMIB at 48-50; CMRB at 24; RMIB at 18-21; SMIB at 21-22.

The intrinsic evidence expressly discloses that a "no pairing" is a "type of pairing." Nonasserted claims 3 and 16 both recite "wherein the first type of pairing comprises no pairing":

> 3. The playback device of claim [1] *10,* wherein the first type of pairing comprises no pairing with another playback device and the second type of pairing comprises pairing with one or more additional playback devices.
>
> 16. The method of claim [14] *19,* wherein the first type of pairing comprises no pairing with another playback device and the second type of pairing comprises pairing with one or more additional playback devices.

'959 patent, cls. 3, 6. The specification likewise describes a "no pairing" as a "type of pairing":

> Further, it is understood that going from a configuration of *no pairing (unpaired or non paired)* to a configuration of pairing or from one kind of pairing (e.g., a pairing used in a type of stereo mode or theater mode) to a different kind of pairing (e.g., another pairing used in a type of stereo mode or theater mode) *are all various types of "pairing" that can occur according to certain embodiments.* In addition,

> disengaging a pairing between multiple playback devices might go from pairing to no pairing or from pairing of a first kind back to pairing of a previous kind, for example.
>
> In one example, *a first type of pairing might include "no pairing" with another playback device* and a second type of pairing might include pairing with one or more additional playback devices.

Id. at 15:48-61 (emphasis added).

Google does not dispute the clear teachings of the patent. *See generally* RMIB at 18-21. Rather, Google argues: "[J] udicial estoppel bars Sonos from advancing a construction of 'pairing' that is inconsistent with its position in the *Denon* litigation." *Id*. at 21. The undersigned is not convinced by Google's argument. *See New Hampshire v. Maine,* 532 U.S. 742, 750 (2001) (listing factors that inform the decision of whether the doctrine of judicial estoppel applies). Staff (like Sonos) proposes that the term "type of pairing" covers "no pairing." SMIB at 21-22. Staff was not a party to the *Denon* litigation. Thus, Google's judicial estoppel argument cannot apply to Staff. Furthermore, the undersigned agrees with Sonos that construing the term "type of pairing" to include a "no pairing" is consistent with the parties' agreed upon construction of "pairing." As Sonos explained, "[i]n ordinary language, the concept of 'type' frequently covers both (1) a category of possible variations and (2) the alternative 'none of the above.'" CMIB at 50.

Having rejected Google's judicial estoppel argument, the undersigned must now decide between Sonos' and Staff's proposed constructions. Words of a claim are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art. *Phillips*, 415 F.3d at 1312-13; *InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 690 F.3d 1318, 1324 (Fed. Cir. 2012). Because the meaning on these terms is apparent from the plain language of the claims, as well as the specification, the undersigned agrees with Staff that no further construction is necessary.

For these reasons, the terms "type of pairing," "first type of pairing," and "second type of pairing" shall be construed in accordance with their plain and ordinary meaning.

Within seven days of the date of this document, the parties shall submit to the Office of the Administrative Law Judges a joint statement as to whether or not they seek to have any portion of this document deleted from the public version. If the parties do seek to have portions of this document deleted from the public version, they must submit to this office a copy of this document with red brackets indicating the portion or portions asserted to contain confidential business information. The submission may be made by email and/or hard copy by the aforementioned date and need not be filed with the Commission Secretary.

SO ORDERED.

Charles E. Bullock
Chief Administrative Law Judge

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **ORDER** has been served via EDIS upon the Commission Investigative Attorney, **Cortney Hoecherl, Esq**., and the following parties as indicated, on October 6, 2020.

Lisa R. Barton, Secretary
U.S. International Trade Commission
500 E Street, SW, Room 112
Washington, DC 20436

On Behalf of Complainant Sonos, Inc.:

Jordan L. Coyle, Esq.
ORRICK, HERRINGTON, & SUTCLIFF LLP
Columbia Center
1152 15th Street, NW
Washington, DC 20005
Email: jcoyle@orrick.com

☐ Via Hand Delivery
☐ Via Express Delivery
☐ Via First Class Mail
☒ Other: Email Notification of Availability for Download

On Behalf of Respondents Google LLC:

S. Alex Lasher, Esq.
QUINN EMANUEL URQUHART & SULLIVAN, LLP
1300 I Street NW, Suite 900
Washington, DC 20005
Email: alexlasher@quinnemanuel.com

☐ Via Hand Delivery
☐ Via Express Delivery
☐ Via First Class Mail
☒ Other: Email Notification of Availability for Download