IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

RESONANT SYSTEMS, INC. d/b/a RevelHMI, Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Case No. 2:22-cv-00423-JRG-RSP **JURY DEMANDED**

PLAINTIFF RESONANT SYSTEMS, INC.'S
OPENING CLAIM CONSTRUCTION BRIEF

TABLE OF CONTENTS

I. INTRODUCTION 1

II. ASSERTED PATENTS 1

III. LEVEL OF ORDINARY SKILL IN THE ART 2

IV. DISPUTED CLAIM TERMS 3

A. "vibration module" ('081 and '830 patents, claims 1-8, 17) 3

B. "frequency" ('081 and '830 patents, claims 1, 2, 5, 6, 17) 4

C. Typographical error in claim 4 ('081 and '830 patents, claims 4, 5, 6) 5

D. "wherein the one or more operational control outputs is a control output that determines a current supplied by the power supply to the driving component and a frequency at which the control component drives the moveable component to [linearly] oscillate" ('081 and '830 patents, claim 6) 9

E. "tube" ('081 and '830 patents, claim 8) 10

F. "moveable component" ('081 and '830 patents, claims 1, 2, 5-7, 17) 11

G. "driving component that drives the moveable component [in each of two opposite directions/to oscillate] within the housing" ('081 and '830 patents, claim 1) 13

H. "control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by [user input received from the user-input features / one or more stored values" ('081 and '830 patents, claim 1) 14

1. An oscillator circuit is sufficient for performing the claimed function, and is a structural element for which no algorithm is required 16

2. A microcontroller connotes structure to a POSITA – it is not a general-purpose computer requiring special programming 18

3. The corresponding algorithm contemplates setting the mode and strength to values "representing" user selections 19

4. RevelHMI's corresponding algorithm is sufficient for performing the claimed function—it is not necessary for the processor to also provide an output to the driving component 19

I. "wherein the control component receives output signals from sensors within the [linear] vibration module during operation of the [linear] vibration module and adjusts one or more operational control outputs of the control component according to the received output signals from the sensors" ('081 and '830 patents, claim 3)..... 22

J. "wherein the control component adjusts the one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of the [linear] vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters" ('081 and '830 patents, claim 4) 24

K. "wherein the one or more operational control parameters is a strength of vibration produced by the [linear] oscillation of the moveable component; and wherein the one or more operational control outputs is a frequency at which the control component drives the moveable component to [linearly] oscillate, the control component dynamically adjusting the power supplied to the driving component to produce [linear] oscillation of the movable component at a resonant frequency for the linear vibration module" ('081 and '830 patents, claim 5) 24

L. "wherein the one or more operational control parameters include both a strength of vibration produced by the linear oscillation of the moveable component and a current operational mode; and wherein the one or more operational control outputs is a control output that determines a current supplied by the power supply to the driving component and a frequency at which the control component drives the moveable component to [linearly] oscillate" ('081 and '830 patents, claim 6) 28

1. Claim 6 is not subject to 35 U.S.C. § 112 ¶ 6 29

2. Even if 35 U.S.C. § 112 ¶ 6 does apply, the specification discloses sufficient structure for performing Samsung's proposed function..... 30

V. CONCLUSION..... 30

TABLE OF AUTHORITIES

Cases

Apex Inc. v. Raritan Comp., Inc.,
325 F.3d 1364 (Fed. Cir. 2003)..... 12

Budde v. Harley-Davidson, Inc.,
250 F.3d 1369 (Fed. Cir. 2001)..... 30

CBT Flint Partners, LLC v. Return Path, Inc.,
654 F.3d 1353 (Fed. Cir. 2011)..... 6

Dyfan, LLC v. Target Corp.,
28 F.4th 1360 (Fed. Cir. 2022) 12, 29

Grp. One, Ltd. v. Hallmark Cards, Inc.,
407 F.3d 1297 (Fed. Cir. 2005)..... 6

HTC Corp. v. IPCom GmbH & Co., KG,
667 F.3d 1270 (Fed. Cir. 2012)..... 18, 30

Intel Corp. v. Qualcomm Inc.,
21 F.4th 801 (Fed. Cir. 2021) 14

JVW Enters., Inc. v. Interact Accessories,
424 F.3d 1324 (Fed. Cir. 2005)..... 3

Micro Chem., Inc. v. Great Plains Chem. Co.,
194 F.3d 1250 (Fed. Cir. 1999)..... 16, 21, 24, 28

Microprocessor Enhancement Corp. v. Texas Instruments Inc.,
520 F.3d 1367 (Fed. Cir. 2008)..... 8

Nanology Alpha LLC v. WITec Wissenschaftliche Instrumente und Technologie GmbH,
No. 6:16-CV-00445-RWS, 2017 WL 5905272 (E.D. Tex. Nov. 30, 2017)..... 13

Northrop Grumman Corp. v. Intel Corp.,
325 F.3d 1346 (Fed. Cir. 2003)..... 21, 24, 28

Novo Indus., L.P. v. Micro Molds Corp.,
350 F.3d 1348 (Fed. Cir. 2003)..... 6

Ollnova Techs. Ltd. v. ecobee Techs., ULC d/b/a ecobee,
No. 2:22-CV-00072-JRG, Dkt. No. 105 (E.D. Tex. Apr. 10, 2023)..... 6, 8

Pavo Sols. LLC v. Kingston Tech. Co.,
35 F.4th 1367 (Fed. Cir. 2022) 6

SanDisk Corp. v. Memorex Prods.,
415 F.3d 1278 (Fed. Cir. 2015)..... 14

Solas OLED Ltd. v. Samsung Elecs. Co.,
No. 2:21-CV-00105-JRG, 2022 WL 36222 (E.D. Tex. Jan. 4, 2022) 9

Thorner v. Sony Comp. Ent. Am. LLC,
669 F.3d 1362 (Fed. Cir. 2012)..... 3

Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.,
587 F.3d 1339 (Fed. Cir. 2009)..... 6

Univ. of Pitt. of Commonwealth Sys. of Higher Educ. v. Varian Med. Sys., Inc.,
561 F. App'x 934 (Fed. Cir. 2014) 20, 24, 28

Statutes

35 U.S.C. § 112 ¶ 6 ..... passim

TABLE OF EXHIBITS

NO.	DESCRIPTION
1	U.S. Patent No. 9,369,081 ("'081 patent")
2	U.S. Patent No. 9,941,830 ("'830 patent")
3	Declaration of Dr. Richard Hooper, RevelHMI's claim construction expert ("Hooper Decl.")
4	Declaration of Dr. Clifton Forlines, Samsung's claim construction expert ("Forlines Decl.")
5	Deposition transcript of Dr. Forlines ("Forlines Tr.")
6	Dictionary of Computing, Sixth Ed., 146 (2010) (SAMRES_00053905-07)
7	Dictionary of Energy (2009) (SAMRES_00053908-10)
8	McGraw-Hill Concise Encyclopedia of Science & Technology, Sixth Ed., 983 (2009) (SAMRES_00053914-16)
9	Lowes webpage for "Tubes," https://www.lowes.com/pl/Tubes-Metal-rods-shapes-sheets-Hardware/2641124591, printed on Nov. 1, 2023
10	Petition for *Inter Partes* Review of U.S. Patent No. 9,369,081 (IPR2023-00992, June 14, 2023)
11	Petition for *Inter Partes* Review of U.S. Patent No. 9,941,830 (IPR2023-00993, June 14, 2023)

I. INTRODUCTION

The Samsung Defendants' scattershot approach to claim construction is fundamentally flawed, and Samsung's proposed constructions and indefiniteness arguments should be rejected. In stark contrast, Plaintiff Resonant Systems Inc. ("RevelHMI") offers constructions that are consistent with the intrinsic evidence, the understanding of a POSITA, and applicable law.

Samsung first seeks to construe several claim terms that it concedes are not subject to 35 U.S.C. § 112 ¶ 6. For most of these terms, Samsung seeks a narrowing construction by importing limitations from the specification that describe exemplary embodiments, defying fundamental principles of claim construction. Samsung also raises three meritless indefiniteness arguments that feign ignorance over an obvious, single-character typographical error.

As to the remaining terms, Samsung argues that all of them are subject to 35 U.S.C. § 112 ¶ 6 and, in nearly all cases, require disclosure of an algorithm allowing a general-purpose computer to perform the claimed function. RevelHMI attempted to compromise with Samsung where it could in order to minimize disputes, but Samsung's remaining arguments are too unprincipled for compromise. For some terms, Samsung improperly seeks to narrow the claimed function by adding non-functional claim language. For several others, Samsung identifies corresponding structure that excludes disclosed embodiments or adds steps to algorithms that are unnecessary for performing the claimed functions—both of which are plainly improper under Federal Circuit precedent.

As detailed below and in the declaration of RevelHMI's claim construction expert, Dr. Richard Hooper, Samsung's proposals should be rejected and RevelHMI's should be adopted.

II. ASSERTED PATENTS

This case involves U.S. Patent No. 9,369,081 ("'081 patent") and U.S. Patent No. 9,941,830 ("'830 patent"), which are related and share the same specification. Claims 1-8 and 17 of each patent are asserted against Samsung, and there are no differences between a given claim

in one patent and the same numbered claim in the other patent that are material to the parties' claim construction disputes. Because of this overlap, citations and other references to one patent are equally applicable to both asserted patents, with only slight differences in specification line numbering and non-material differences in claim language noted with brackets herein.

The asserted patents relate to controlling vibration according to a desired amplitude and frequency. Claim 1 of the '081 patent is exemplary and recites:

> 1. A linear vibration module comprising:
>
> a housing;
>
> a moveable component;
>
> a power supply;
>
> user-input features;
>
> a driving component that drives the moveable component in each of two opposite directions within the housing; and
>
> a control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by user input received from the user-input features.

III. LEVEL OF ORDINARY SKILL IN THE ART

A POSITA at the time of the invention would have had (1) a bachelor's degree in electrical engineering, mechanical engineering, or a comparable field of study, and (2) at least two years of professional experience with electro-mechanical control systems, or other similarly relevant industry experience. Hooper Decl. ¶ 23. Additional relevant industry experience may compensate for lack of formal education or vice versa. *Id.* RevelHMI's expert, Dr. Hooper, personally qualified as a POSITA as of the earliest claimed priority date and also understood the capabilities of a POSITA at the relevant time because he was working with and managing engineers with similar training and experience during that period. *Id.* Samsung's expert, Dr. Clifton Forlines, agrees that Dr. Hooper is qualified as an expert in the relevant technology. Forlines Tr. at 20:4-21 ("I would agree that Dr. Hooper is well positioned to, you know, comment on technology in this space.").

IV. DISPUTED CLAIM TERMS[1]

A. "vibration module" ('081 and '830 patents, claims 1-8, 17)

RevelHMI's Proposal	Samsung's Proposal
Plain and ordinary meaning	"**a vibration-generating device that can be incorporated in a wide variety of appliances, devices, and systems to provide vibrational forces**"

The phrase "vibration module" does not require construction. This is a simple, two-word phrase that would be readily understood by a POSITA and jury. Hooper Decl. ¶¶ 26-28. Samsung's proposal seeks to replace this term with a 20-word string that does not add clarity and only seeks to narrow the claims to exemplary applications described in the specification.

Samsung's approach here is emblematic of its proposals for other terms, in that Samsung improperly seeks to limit the claims to particular disclosed embodiments, despite there being no lexicography or disclaimer to justify this. *See, e.g.*, *Thorner v. Sony Comp. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) ("There are **only two exceptions**" in which claim terms are not given their full ordinary and customary meaning: "1) when a patentee sets out a definition and acts as his own **lexicographer**, or 2) when the patentee **disavows** the full scope of a claim term either in the specification or during prosecution.");[2] *JVW Enters., Inc. v. Interact Accessories*, 424 F.3d 1324, 1335 (Fed. Cir. 2005) (without clear and unambiguous disclaimer or lexicography, courts "**do not import limitations into claims from examples or embodiments** appearing only in a patent's written description, even when a specification describes very specific embodiments of the invention or even describes only a single embodiment").

Most of Samsung's proposed construction language (i.e., everything after "a vibration-

[1] The parties have also identified two agreed constructions, including that the preamble of claim 1 of each asserted patent is limiting. *See* Dkt. No. 65 (JCCS) at 1-2.

[2] All emphasis in quoted material has been added unless otherwise noted.

generating device") is quoted from the specification. *See, e.g.*, '081 patent at Abstract, 3:7-10. Critically, though, this language is **not a definition** for "module," "vibration module," or anything else, **nor is it a disclaimer** of any kind. Hooper Decl. ¶ 27. Instead, the specification simply states that it describes "various types of linear vibrational modules, including linear-resonant vibration modules, that can be incorporated in a wide variety of appliances, devices, and systems to provide vibrational forces." That is simply a description of how vibration modules can be used in practice, such as in commercial applications. *Id*. ¶ 27. Such a description does not limit claim scope.

B. "frequency" ('081 and '830 patents, claims 1, 2, 5, 6, 17)

RevelHMI's Proposal	Samsung's Proposal
Plain and ordinary meaning	"**rate of oscillation**"

The word "frequency" would be readily understood by a POSITA and jury. *See* Hooper Decl. ¶¶ 29-31. It does not require construction.

There is no lexicography or disclaimer to support Samsung's attempt to narrow the scope of this claim term. As Samsung's expert acknowledges, the plain meaning of "frequency" is broader than Samsung's proposal and can refer, for example, to how often an event (not just oscillation) occurs. *E.g.*, Forlines Tr. at 41:18-42:8 ("I think the word 'frequency' can have other meanings. You might speak about the frequency in which you visit your parents ….").

Samsung's proposed construction does not even come from the specification, nor does Samsung's proposal use language that would be more easily understood by a jury. Hooper Decl. ¶ 30. In fact, the intrinsic evidence shows the word "frequency" being used in multiple different contexts, some of which refer to oscillation of a moving mass/weight and others of which involve, for example, how frequently the direction of current is changed. *E.g.*, '081 patent at 5:43-45 ("the frequency at which the direction of the current applied to the coil is changed"). Samsung seeks to limit the scope of "frequency" only to particular usages of that term within the specification, which

would not be a proper basis for Samsung's construction even if the specification only used the term to refer to oscillation of the moving mass/weight (and it does not). *E.g.*, *JVW Enters*, 424 F.3d 1324, 1335 (Fed. Cir. 2005) (courts "do not import limitations into claims from examples or embodiments appearing only in a patent's written description, even when a specification describes very specific embodiments of the invention or even describes only a single embodiment").

It also bears noting that the three dictionary definitions of "frequency" raised by Samsung in its disclosures do not support Samsung's proposal. *See* Dkt. No. 65-1 at 3; Exs. 6, 7, 8. None includes the phrase "rate of oscillation" or even the word "rate," and only one includes a variant of the word "oscillation." *Id.* Samsung's own extrinsic evidence does not support its proposal.

C. Typographical error in claim 4 ('081 and '830 patents, claims 4, 5, 6)

Claim Term	RevelHMI's Proposal	Samsung's Proposal
"claim 1" ('081 and '830 patents, claim 4)	"**claim 3**"; not indefinite	Plain and ordinary meaning
"the one or more operational control outputs" ('081 and '830 patents, claims 4, 5, 6)	Plain and ordinary meaning; **not indefinite**	**Indefinite; no antecedent basis**
"the received output signals from the sensors" ('081 and '830 patents, claim 4)	Plain and ordinary meaning; **not indefinite**	**Indefinite; no antecedent basis**
"the sensors" / "the one or more sensors" ('081 and '830 patents, claim 4)	Plain and ordinary meaning; **not indefinite**	**Indefinite; no antecedent basis**

Claim 4 of each asserted patent includes a one-character typographical error that should be corrected. Instead of claim 4's preamble reciting "The [linear] vibration module of claim **1**," the preamble should read "The [linear] vibration module of claim **3**." It is clear from the claim language that this is a one-character typographical error, and the specification and prosecution history do not suggest any different interpretation. A POSITA would readily recognize this as a typo, and Samsung cannot meet the heavy burden of proving indefiniteness by clear and convincing evidence with respect to any disputed term. *See* Hooper Decl. ¶¶ 32-37.

All four of the claim construction disputes listed above relate to this same issue. In the first dispute, RevelHMI proposes that the typographical error be corrected, such that the phrase "of claim 1" appearing at the start of claim 4 would be replaced with "of claim 3." Samsung denies that this is a typographical error and argues that "claim 1" should be applied as written. Samsung takes this position not out of principle but because doing so enables Samsung to present the three indefiniteness arguments listed in the above table, all of which are based on lack of antecedent basis. But the challenged phrases do have clear antecedent basis in claim 3, demonstrating that the typo identified by RevelHMI should be corrected. *See* Hooper Decl. ¶ 33.

As this Court explained in the *Ollnova Technologies* case:

> "A district court may correct 'obvious minor typographical and clerical errors in patents.'" *Pavo Sols. LLC v. Kingston Tech. Co*., 35 F.4th 1367, 1373 (Fed. Cir. 2022) (quoting *Novo Indus., L.P. v. Micro Molds Corp*., 350 F.3d 1348, 1357 (Fed. Cir. 2003)). "Correction is appropriate 'only if (1) the correction is **not subject to reasonable debate** based on consideration of the claim language and the specification and (2) the **prosecution history does not suggest a different interpretation** of the claims.'" *Id*. (quoting *Novo Indus*., 350 F.3d at 1354). "The **error must be 'evident from the face of the patent**,' . . . and the determination 'must be made from the point of view of one skilled in the art[.]'" *Id*. (quoting *Grp. One, Ltd. v. Hallmark Cards, Inc*., 407 F.3d 1297, 1303 (Fed. Cir. 2005), and *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp*., 587 F.3d 1339, 1353 (Fed. Cir. 2009)). "In deciding whether a particular correction is appropriate, the court 'must consider how a potential correction would impact the scope of a claim and if the inventor is entitled to the resulting claim scope based on the written description of the patent.'" *Id*. (quoting *CBT Flint Partners, LLC v. Return Path, Inc*., 654 F.3d 1353, 1359 (Fed. Cir. 2011)).

Ollnova Techs. Ltd. v. ecobee Techs., ULC d/b/a ecobee, No. 2:22-CV-00072-JRG, Dkt. No. 105 at 9 (E.D. Tex. Apr. 10, 2023) (hereinafter "*Ollnova*") (making judicial correction).

The requirements for judicial correction are met here. The parties agree that an error is evident from the face of the patent, which is what Samsung uses as the basis for its indefiniteness arguments. But those same indefiniteness arguments demonstrate that there can be no reasonable debate that the preamble of claim 4 was intended to recite "The [linear] vibration module of claim

3." For example, claim 4 recites three phrases that are preceded by the word "the" but have no antecedent basis from earlier in claim 4 or from claim 1: (1) "the one or more operational control outputs," (2) "the received output signals from the sensors," and (3) "the [one or more] sensors." *See* '081 and '830 patents, cl. 4. Samsung recognizes that if RevelHMI's proposed correction (i.e., the change of a single character from "claim 1" to "claim 3") were implemented, then Samsung's indefiniteness arguments would have no grounds because claim 3 provides proper antecedent basis for all three of the phrases alleged to be indefinite.

According to Samsung, it is "equally plausible" that the patentee mistyped a single numeral as it is that the patentee mistakenly introduced three new phrases in claim 4, each preceded by the definite article "the." Forlines Decl. ¶¶ 52-55; Forlines Tr. at 28:13-25. That is not a credible argument. As Dr. Hooper explains, "[a] single-character typo is a far more reasonable explanation for the lack of antecedent basis Samsung raises than the patentee rendering its own patent claim indefinite in three separate ways." Hooper Decl. ¶ 36. The patentee plainly intended to refer back to the immediately preceding claim 3, which provides clear antecedent basis for all three phrases Samsung challenges. *Id.* Reading claims 3 and 4 together only further illustrates this, because claim 4 builds upon claim 3 by adding further limitations to the "adjusts" limitation of claim 3:

> 3. The linear vibration module of claim 1 wherein the control component receives output signals from sensors within the linear vibration module during operation of the linear vibration module and adjusts one or more operational control outputs of the control component according to the received output signals from the sensors.
>
> 4. The linear vibration module of claim 1 wherein the control component adjusts the one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of the linear vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters.

'081 patent at cls. 3, 4; *see also id.* at 6:24-42 (describing how sensor output signals are received and used adjusting control outputs, consistent with the limitations of claims 3 and 4).

Thus, there can be no reasonable debate as to what correction should be made. It is far more likely that the patentee made a single-character typo (mistaking one numeral for another) than it is that the patentee mistakenly added the word "the" three separate times. Indeed, Samsung's expert was asked at deposition whether "adding the word 'the' three separate times is unlikely to be a typo" and struggled to offer a nonsensical explanation of how "this could be explained by a copy-paste error" of "[p]erhaps copying and pasting, you know, these, you know, phrases with an antecedent basis, you know, from elsewhere, you know, in, you know, errors in drafting where, you know, we get used to, you know, certain phrases and whatnot as we're typing." Forlines Tr. at 29:16-30:5. Again, this is not credible and does not rise to the level of reasonable debate.

Neither the prosecution histories of the asserted patents, nor any other intrinsic evidence, suggest any different interpretation. As Dr. Hooper explains, all intrinsic evidence either supports RevelHMI's conclusion (i.e., one-character typo) or is neutral on the subject. Hooper Decl. ¶ 37.

Furthermore, RevelHMI's proposed correction "will not impact the scope of the claim, as the correction aligns with how a skilled artisan would understand the limitation in its uncorrected form." *Ollnova* at 11; *see* Hooper Decl. ¶ 34 ("While I believe a POSITA would not need for this typo to be corrected in order to understand claim 4, I understand that a typographical error in a patent claim can be corrected …."). And there can be no dispute that claim 4 as corrected would be fully supported by the specification. *See, e.g.*, '081 patent at 6:24-42, 7:32-8:9, Figs. 6, 7B.

With RevelHMI's proposed correction (i.e., replacing "of claim 1" with "of claim 3"), Samsung's lack of antecedent basis arguments fall away, mooting its indefiniteness positions. RevelHMI respectfully requests that the Court make this judicial correction.[3]

[3] Notably, "claims are not necessarily invalid for a lack of antecedent basis." *Microprocessor Enhancement Corp. v. Texas Instruments Inc*., 520 F.3d 1367, 1376 (Fed. Cir. 2008). In particular,

D. "wherein the one or more operational control outputs is a control output that determines a current supplied by the power supply to the driving component and a frequency at which the control component drives the moveable component to [linearly] oscillate" ('081 and '830 patents, claim 6)

RevelHMI's Proposal	Samsung's Proposal
Plain and ordinary meaning	"wherein the one or more operational control outputs is a control output that determines a current supplied by the power supply to the driving component and **is** a frequency at which the control component drives the moveable component to [linearly] oscillate"

A POSITA would understand this claim term as "wherein the one or more operational control outputs is **a control output** that determines [1] a current supplied by the power supply to the driving component and [2] a frequency at which the control component drives the moveable component to [linearly] oscillate." This is the plain and ordinary meaning and makes grammatical sense because the claim refers to "a control output" (singular) and goes on to recite two quantities that the control output determines. *See* Hooper Decl. ¶¶ 38-39. There is no need for construction.

Samsung proposes interpreting this term as "wherein the one or more operational control outputs [1] is a control output that determines a current supplied by the power supply to the driving component and [2] **is** a frequency at which the control component drives the moveable component to [linearly] oscillate." But the plain language of the claim does not require that the control output is itself a frequency. Contrary to Samsung's suggestions, the claim is not ambiguous as written because it would not make grammatical sense to require two separate control outputs because the claim recites "is **a** control output" before reciting that this control output determines current and frequency. This is why Samsung is compelled to add an "is" in its proposed construction. But there

---

"when a claim's meaning would reasonably be understood by skilled artisans when read in light of the specification, it is not invalid." *Solas OLED Ltd. v. Samsung Elecs. Co.*, No. 2:21-CV-00105-JRG, 2022 WL 36222, at *5 (E.D. Tex. Jan. 4, 2022). Even without RevelHMI's proposed correction, it is clear from surrounding claim language and the specification what each of the three allegedly indefinite phrases refers to, such that their meaning would still be readily understood.

is no lexicography or disclaimer that would require interpreting the claim as Samsung proposes. It also bears noting that, by contrast, claim 5 specifically "wherein the one or more operational control outputs **is** a frequency," demonstrating that the patentee could have (and elsewhere did) include a requirement that the control output itself is a frequency. The patentee simply did not include such a requirement in claim 6, and Samsung's attempt to add one now should be rejected.

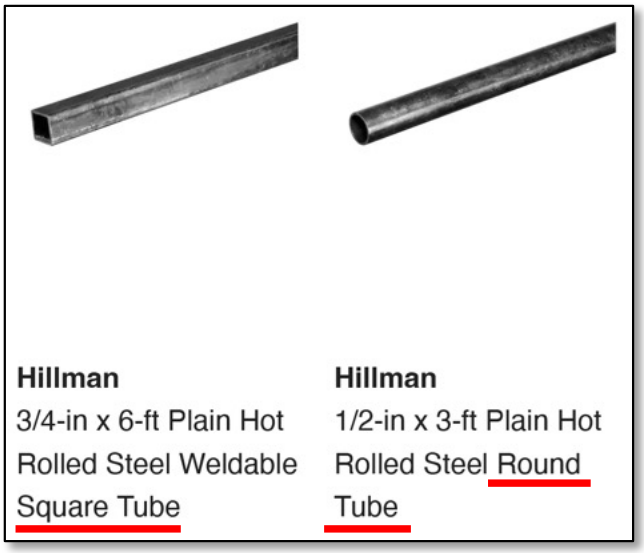
E. "tube" ('081 and '830 patents, claim 8)

RevelHMI's Proposal	Samsung's Proposal
Plain and ordinary meaning	"**cylindrical housing**"

The term "tube" would be readily understood by a POSITA and jury. Hooper Decl. ¶¶ 40-42. This is a simple term that does not require construction. Indeed, even Samsung's expert "ha[d]n't considered" "whether this claim term needs to be construed." Forlines Tr. at 56:20-22.

A POSITA would recognize that tubes come in multiple different shapes, including ones with rectangular and square cross-sections, in addition to cylindrical tubes with round cross-sections. Hooper Decl. ¶¶ 41-42. Yet Samsung seeks to limit this term to only cylindrical tubes, with no lexicography or disclaimer to support such a narrowing construction.

As Dr. Hooper explains, "a POSITA would be readily familiar with tubes of square or rectangular cross-section made of metal or other materials, which are readily available from suppliers." Hooper Decl. ¶ 42. For example, the Lowes.com website has a section on "Tubes" that features categories for "Square" and "Round" tubes and, in fact, lists numerous "square" tubes before the first listing of a "round" tube, excerpted at right:



Ex. 9 at 6 (annotated). "[E]specially in the context of constructing a mechanical device as claimed in Claim 8 of the '081 and '830 patents, a POSITA would recognize that 'tube' does not necessarily refer to a cylindrical structure, but can also include tubes with square or rectangular cross-sections." Hooper Decl. ¶ 42. As Dr. Hooper further explains, "[t]he scope of 'tube' is not defined by cross-section but by other familiar properties known to both a POSITA and the jury, such as by being hollow and relatively narrow." *Id.* ¶ 41.

At deposition, Samsung's expert tried to dismiss RevelHMI's identification of websites selling square tubes as irrelevant because they are "specifically labeled as square tube to distinguish it from tubes, which are not square but are round." Forlines Tr. at 49:18-50:5; *see also id.* at 52:10-22 (explaining that in 2009 "those square tubes would be available and correctly labeled as square tubes"). But what Dr. Forlines forgot is that, as clearly shown in the excerpt above, the websites identified by RevelHMI do not say only "tube" (without any modifier) to refer to a round tube. Instead, they say "square tube" to refer to square tubes and "round tube" to refer to round tubes, demonstrating conclusively that the single word "tube" encompasses more than just round (cylindrical) tubes. *See* Ex. 9; Hooper Decl. ¶ 42.

As with other claim terms, Samsung attempts to justify its proposed narrowing by pointing to exemplary embodiments depicting round/cylindrical tubes, such as Figure 4A. But the law is clear that without clear and unambiguous disclaimer or lexicography (neither of which is even alleged here), courts "**do not import limitations into claims from examples or embodiments** appearing only in a patent's written description, even when a specification describes very specific embodiments of the invention or even describes only a single embodiment." *JVW Enters*, 424 F.3d at 1335. Samsung's attempt to import limitations from examples should be rejected.

F. "moveable component" ('081 and '830 patents, claims 1, 2, 5-7, 17)

RevelHMI's Proposal	Samsung's Proposal
Plain and ordinary meaning; **not subject to 35 U.S.C. § 112 ¶ 6**. If subject to 35 U.S.C. § 112 ¶ 6, then: **Function**: moving **Structures**: A moving weight. E.g., '081 and '830 Patents, Figs 4A-4G (weight 404), Fig. 6 (oscillating mass 634), Fig. 11 (moving mass 1102), Fig. 12 (moving mass with additional coils 1202 and 1204), Fig. 13 (moving mass/weight 1306), Fig. 14 (driving magnet 1406), Figs. 15, 16 (magnets 1506, 1508); and equivalents thereof	**Subject to 35 U.S.C. 112 ¶ 6**. **Function**: moving **Structures**: A moving weight. E.g., '081 and '830 Patents, Figs 4A-4G (weight 404), Fig. 6 (oscillating mass 634), Fig. 11 (moving mass 1102), Fig. 12 (moving mass with additional coils 1202 and 1204), Fig. 13 (moving mass/weight 1306), Fig. 14 (driving magnet 1406), Figs. 15, 16 (magnets 1506, 1508)

The term "moveable component" is presumptively not a means-plus-function term because it does not include the word "means." *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1365 (Fed. Cir. 2022) ("we presume that a claim limitation is not drafted in means-plus-function format in the absence of the term 'means'"). Samsung cannot overcome this presumption because "moveable component" does not fail to recite sufficiently definite structure, nor does it recite function without sufficient structure for performing that function. *Id.* As Dr. Hooper explains, "[t]he claims do not require the moveable component to perform any particular function—the claims merely require that it be moveable and describe circumstances that would cause it to be moved," such that "a POSITA would understand 'moveable component' to be a structural term." Hooper Decl. ¶ 44. The term "moveable component" does not even recite "a specified function" (as required by the statutory language of 35 U.S.C. § 112 ¶ 6), and thus cannot be a means-plus-function term. And where, as here, "it is clear that a claim term itself connotes some structure to a person of ordinary skill in the art, 'the presumption that § 112, ¶ 6 does not apply is determinative' in the absence of 'more compelling evidence of the understanding of one of ordinary skill in the art.'" *Dyfan*, 28 F.4th at 1366 (quoting *Apex Inc. v. Raritan Comp., Inc.*, 325 F.3d 1364, 1373 (Fed. Cir. 2003)).

Highly similar claim terms have been found not to invoke Section 112(6). For example, another court in this District found with respect to "moving mechanism" that "the claims not only describe the structural elements, but also recite the interaction between the structural elements," such that "the term 'moving mechanism' therefore imparts structure and its structure is described in the claims." *Nanology Alpha LLC v. WITec Wissenschaftliche Instrumente und Technologie GmbH*, No. 6:16-CV-00445-RWS, 2017 WL 5905272, at *10 (E.D. Tex. Nov. 30, 2017). The same is true here because the claim makes clear how the moveable component interacts with other recited structural elements. *E.g.*, '081 patent at cls. 1, 2, 5-7, 17. The *Nanology* court also explained that § 112 ¶ 6 does not apply when the written description provides context as to how the claimed components 'interact[ ] with other components ... in a way that ... inform[s] the structural character of the limitation-in-question or otherwise impart[s] structure.'" *Nanology*, 2017 WL 5905272, at *11. The specification here also describes how the moveable component interacts with other structural elements. *E.g.*, '081 patent at Figs. 4A-4G, 10-18, 24A-24B, 25, and corresponding text.

G. "driving component that drives the moveable component [in each of two opposite directions/to oscillate] within the housing" ('081 and '830 patents, claim 1)

RevelHMI's Proposal	Samsung's Proposal
Subject to 35 U.S.C. § 112 ¶ 6. **Function**: driving the moveable component [in each of two opposite directions/to oscillate] within the housing **Structures**: One or more **coils or electromagnets**. E.g., '081 and '830 Patents, Figs 4A-4G (coil 420), Fig. 5A (coil 514), Fig. 6 (coil 626), electromagnet of Fig. 10, electromagnet of Fig. 11, Fig. 12 (coil 1206), Fig. 13 (first coil 1302 and second coil 1304), Fig. 14 (coils 1412 and 1414), Figs. 15, 16 (coil 1510), stator coils of Figures 24A, 24B, and 25; and equivalents thereof	Subject to 35 U.S.C. 112 ¶ 6 **Function**: driving the moveable component [in each of two opposite directions/to oscillate] within the housing **Structures**: One or more **electromagnetic coils**. E.g., '081 and '830 Patents, Figs 4A-4G (coil 420), Fig. 5A (coil 514), Fig. 6 (coil 626), electromagnet of Fig. 10, electromagnet of Fig. 11, Fig. 12 (coil 1206), Fig. 13 (first coil 1302 and second coil 1304), Fig. 14 (coils 1412 and 1414), Figs. 15, 16 (coil 1510), stator coils of Figures 24A, 24B, and 25

Samsung seeks a narrowing construction without any proper basis. The parties' remaining dispute boils down to whether the corresponding structure for this term can include electromagnets that are not coils. Claim 8, which depends from claim 1, makes clear that Samsung is wrong, because claim 8 adds a further requirement that "the driving component is an electromagnetic coil." *E.g.*, '081 patent at cl. 8. If claim 1 were already limited to electromagnetic coils only, this limitation of claim 8 would be superfluous. *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 810 (Fed. Cir. 2021) ("It is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous."). Moreover, as shown by the identical listings of exemplary structures in the table above, the parties agree that the specification discloses electromagnets without specifying that they are electromagnetic coils. *See also, e.g.*, '081 patent at 15:1-5 ("The components of the LRVM, including the housing, moving mass, fixed magnets, and electromagnets, can be fashioned from many different types of materials ….."); *SanDisk Corp. v. Memorex Prods.*, 415 F.3d 1278, 1285-86 (Fed. Cir. 2015) (constructions that exclude embodiments are "rarely, if ever, correct").

Samsung's expert agrees that "there are electromagnets that do not include coils." Forlines Tr. at 77:23-78:7. Samsung's expert also offered no opinion that lexicography or disclaimer supports Samsung's proposal. *Id.* at 85:19-86:23. As there is no proper basis for limiting the driving component to electromagnetic coils only, RevelHMI's proposal should be adopted.

H. "control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude specified by [user input received from the user-input features / one or more stored values" ('081 and '830 patents, claim 1)

RevelHMI's Proposal	Samsung's Proposal
Subject to 35 U.S.C. § 112 ¶ 6. **<u>Function</u>**: controlling supply of power from the power supply to the driving component to cause the moveable component to oscillate at a frequency and an amplitude	Subject to 35 U.S.C. 112 ¶ 6. **<u>Function</u>**: controlling supply of power from the power supply to the driving component to cause the moveable component to

RevelHMI's Proposal	Samsung's Proposal
specified by [user input received from the user-input features / one or more stored values] **Structures**: **oscillator circuit; microcontroller with internal or external memory;** processor; **CPU; microprocessor;** and equivalents thereof [if an algorithm is required] Where the corresponding structure is a processor, CPU, or microprocessor, the processor/CPU/microprocessor is programmed with an algorithm comprising the following steps: (a) set the mode and strength to [default values or] values **representing** selections made by user input to the user input features; and (b) provide a corresponding output to the power supply **so that the power supply provides a corresponding output to the driving component** *See, e.g.*, '081 patent at 7:10-24, 8:10-20, Figs. 7A, 7C; '830 patent at 7:20-34, 8:20-30, Figs. 7A, 7C **In the alternative**, if the Court finds that a three-step algorithm is necessary, then RevelHMI proposes that the following three-step algorithm (which Samsung proposed in its IPR petitions) be adopted by the Court: (1) set the mode and strength to [default values or] values represented by selections made by user input to the user input features, (2) provide a corresponding output to the power supply, and (3) **provide a corresponding output to an H-bridge switch**.	oscillate at a frequency and an amplitude specified by [user input received from the user-input features / one or more stored values] **Structures**: **Processor** programmed with an algorithm to perform the following steps: (1) set the mode and strength to [default values or] values **represented by** selections made by user input to the user input features, (2) provide a corresponding output to the power supply, and (3) **provide a corresponding output to the driving component**. '081 Patent at 7:10-24, 8:10-20, Figs. 7A, 7C. '081 Patent at 7:10-24, 8:10-20, Figs. 7A, 7C; '830 Patent at 7:20-34, 8:20-30, Figs. 7A, 7C

Samsung's proposed construction ignores embodiments in the specification and seeks to narrow these claim terms to require an algorithm with steps that are unnecessary for performing the claimed function. *See* Hooper Decl. ¶¶ 47-52. Samsung's proposal should be rejected.

The parties' disputes over the "control component" of claim 1 term boil down to four issues: (1) whether an oscillator circuit is sufficient for performing the claimed function; (2) whether a microcontroller is a general-purpose processor that requires special programming with a corresponding algorithm; (3) whether the algorithm contemplates setting the mode and strength to values "represented by" user selections or values "representing" user selections; and (4) whether

the algorithm also requires the processor to provide an output to the driving component.

1. An oscillator circuit is sufficient for performing the claimed function, and is a structural element for which no algorithm is required

The parties agree as to the claimed function, but Samsung's proposed corresponding structure erroneously omits the disclosed oscillator circuit—thus improperly excluding an embodiment. As the Federal Circuit has explained:

> Identification of corresponding structure may embrace more than the preferred embodiment. **A means-plus-function claim encompasses <u>all structure</u> in the specification corresponding to that element and equivalent structure**. … When multiple embodiments in the specification correspond to the claimed function, proper application of § 112, ¶ 6 generally reads the claim element to embrace **<u>each</u>** of those embodiments.

Micro Chem., Inc. v. Great Plains Chem. Co., 194 F.3d 1250, 1258-59 (Fed. Cir. 1999). The oscillator circuit must be included within the corresponding structures because it is sufficient for performing the claimed function. *Id*. As the specification explains:

> Alternative, lower-cost linear-vibration modules can be designed and manufactured by **replacing the processor** or microcontroller (602 in FIG. 6) of the above-described linear-resonant vibration module **with a simpler oscillator circuit** with additional control circuitry. The H switch (620 in FIG. 6) can be controlled by an oscillating current input rather than digital outputs from a microprocessor. Replacing the CPU or microprocessor with an oscillator and additional simple control circuitry produces a less functional, generally lower-Q, but also more economical linear vibration module that, although lacking the extremely broad range of vibration patterns and modes available to processor or microprocessor-controlled vibration modules, can nonetheless **access a much larger portion of the amplitude/frequency space than can be accessed by currently available fixed-amplitude or fixed-frequency vibration modules**.
>
> In one example implementation of an **oscillator-controlled linear vibration module,** a variable-frequency **oscillator circuit** can be controlled by user input to drive the H switch or other H-switch-like circuit to operate the linear vibration module at **different frequencies**. A user is provided an input feature that allows the user to directly adjust the frequency of the variable oscillator and thus the vibrational frequency produced by the linear vibration module. The user is additionally provided with an input feature to allow the user to control the current or duty cycle used to drive the linear vibration module and to thus **increase and decrease the amplitude** of vibration produced by the linear vibration module. Thus, a **user can control both the frequency of vibration and the amplitude of**

vibration.

'081 patent at 11:43-12:5. Similarly, dependent claim 2 also indicates that the "control component" of claim 1 can be an oscillator circuit. *See id.* at cl. 2.

Samsung argues that "[t]he oscillator circuit described in the specification of the patents does not perform the function of the claims because it is not capable of causing oscillation at a specified amplitude." Forlines Decl. ¶ 109. That is wrong. The specification paragraphs quoted above explicitly state that the oscillator circuit embodiment is superior to "fixed-amplitude … vibration modules" and that a user of the "oscillator-controlled linear vibration module" is able to "**increase and decrease the amplitude of vibration**" as well as the frequency, such that the user can "control both the frequency of vibration **and the amplitude** of vibration." '081 patent at 11:43-12:5. And even without these very explicit disclosures of an oscillator circuit embodiment that allows for amplitude control, Samsung's interpretation would not make sense. It is undisputed that the specification describes processor-based embodiments that allow for both frequency and amplitude to be adjusted, and the specification explicitly characterizes the oscillator circuit embodiment as one in which the processor is replaced by the oscillator circuit to provide a more economical system that "lack[s] the extremely broad range of vibration patterns and modes available to processor or microprocessor-controlled vibration modules" but still provides much greater amplitude variability than a fixed-amplitude vibration module. *Id.*

Importantly, Samsung has not asserted that *no* oscillator circuit can be used to adjust amplitude. Instead, Samsung argues that the specification only describes using the oscillator circuit to adjust frequency, but Samsung is ignoring the explicit disclosures above explaining that the oscillator circuit embodiment (in which the oscillator circuit replaces the processor) allows for frequency ***and amplitude*** adjustments. At his deposition, Dr. Forlines was asked "if we replace the microprocessor with the oscillator circuit, does the system no longer provide the ability to

adjust the amplitude," and he conceded that the amplitude could still be controlled in that embodiment. Forlines Tr. at 71:21-72:19. Dr. Forlines also admitted that the H-bridge switch described for certain disclosed embodiments is not the only way to implement an oscillator circuit—indeed, there are "lots of ways." *Id.* at 61:16-62:20 (describing examples).

Samsung has not argued and cannot argue that an algorithm is required where the corresponding structure is an oscillator circuit. As discussed further below, the specification discloses general-purpose computer processors for which an algorithm would be required, but that is not the case for an oscillator circuit because it is not a general-purpose computer and can perform the claimed function without additional special programming. *See* Hooper Decl. ¶ 49; *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1279-80 (Fed. Cir. 2012).

2. A microcontroller connotes structure to a POSITA – it is not a general-purpose computer requiring special programming

Samsung acknowledges that the specification discloses a microcontroller as corresponding structure but wrongly asserts that it should be treated just like the disclosed processor, CPU, and microprocessor, for purposes of 35 U.S.C. § 112 ¶ 6.[4] *E.g.*, Forlines Decl. ¶ 111. This is despite the fact that Dr. Forlines acknowledges that a microcontroller is different from a microprocessor. *E.g.*, Forlines Tr. at 60:3-61:5. Like the oscillator circuit, the microcontroller disclosed is not a general-purpose computer but instead provides more specific functionality sufficient to perform the claimed function without additional special programming. Hooper Decl. ¶ 49. Thus, there is no need to identify an algorithm for the microcontroller to perform. *HTC*, 667 F.3d at 1279-80.

[4] To clarify, Samsung groups all four of these terms (processor, microprocessor, CPU, and microcontroller) under the term "Processor" in identifying its proposed corresponding structure as "Processor programmed with an algorithm to perform the following steps." Forlines Decl. ¶ 111.

3. The corresponding algorithm contemplates setting the mode and strength to values "representing" user selections

As noted in the table, the parties dispute whether the proposed algorithm refers to setting the mode and strength to "values representing selections made by user input" (RevelHMI) or "values represented by selections made by user input" (Samsung). User input would be received before the mode and strength could be set to values corresponding to user input, so it is much clearer to say that the values represent the user selections than the other way around. Samsung does not explain how user selections could represent values (and Dr. Forlines's declaration does not address this issue), whereas the specification shows the values correspond to user selections. *E.g.*, '081 patent at 6:50-55 (describing setting value of "strength, a numerical value corresponding to the current user-selected strength of operation"). RevelHMI's proposal should thus be adopted.

4. RevelHMI's corresponding algorithm is sufficient for performing the claimed function—it is not necessary for the processor to also provide an output to the driving component

With respect to the disclosed "processor," "microprocessor," and "CPU" corresponding structures, the parties disagree as to what steps the algorithm must include in order to perform the claimed function. While Samsung's algorithm can be used to perform the claimed function, it also recites an unnecessary third step in which the processor "provide[s] a corresponding output to the driving component."[5] RevelHMI's proposed algorithm omits this unnecessary step but is still sufficient for performing the claimed function, such that RevelHMI's proposal should be adopted as the Court's construction. *See* Hooper Decl. ¶ 51.

The parties agree that the claimed function is "control[ling] supply of power from the

[5] To the extent Samsung's proposal is suggesting that a frequency control signal must be sent directly from the processor to the driving component (e.g., coil) without any intermediary, that would be inconsistent with the specification and, as discussed further below, Samsung's IPR petitions. *See, e.g.*, '081 patent at Fig. 6.

power supply to the driving component" to cause oscillation at a desired amplitude and frequency. *E.g.*, '081 patent at cl. 1. And the parties agree as to the first step of the corresponding algorithm (i.e., Samsung's step (1) matches RevelHMI's step (a)). But RevelHMI's step (b) more closely corresponds to the claimed function and specification than Samsung's step (3):

RevelHMI's Algorithm Steps	Samsung's Algorithm Steps
Processor/CPU/microprocessor programmed to: (a) set the mode and strength to [default values or] values representing selections made by user input to the user input features; and (b) provide a corresponding output to the power supply so that the power supply provides a corresponding output to the driving component	Processor programmed to: (1) set the mode and strength to [default values or] values represented by selections made by user input to the user input features, (2) provide a corresponding output to the power supply, and (3) provide a corresponding output to the driving component.

See '081 patent at 8:16-20 ("Next, in step 762, the routine 'control' computes an output value p corresponding to the currently selected strength, stored in the variable strength, and outputs the value p to the power supply so that the power supply outputs an appropriate current to the coil."). A POSITA would recognize that the processor's output to the power supply could include both amplitude and frequency control information. *E.g.*, Hooper Decl. ¶ 51.

Samsung erroneously asserts that its proposed step (3) is necessary because the specification teaches that a frequency control signal can be sent from the processor to an H-bridge switch, which in turn changes the direction of current applied to the driving component. Forlines Decl. ¶¶ 113-117. But Samsung's step (3) is not required to perform the claimed function and thus cannot be included in the algorithm adopted by the Court. *See, e.g.*, *Univ. of Pitt. of Commonwealth Sys. of Higher Educ. v. Varian Med. Sys., Inc.*, 561 F. App'x 934, 941 (Fed. Cir. 2014) ("The district court properly located the disclosure of an algorithm that covered what was **necessary** to

perform the claimed function … and **nothing more** …. The algorithm need only include what is **necessary** to perform the claimed function."); *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1352 (Fed. Cir. 2003) ("A court may not import into the claim features that are **unnecessary** to perform the claimed function. Features that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations."); *Micro Chem.*, 194 F.3d at 1258 (Section 112, ¶ 6 does not "permit incorporation of structure from the written description beyond that **necessary** to perform the claimed function"). Samsung's inclusion of unnecessary steps in its algorithm confirms that its proposal should be rejected.

Indeed, Samsung's proposal here is not even consistent with Samsung's own proposed constructions in the IPR proceedings that it brought against the asserted patents. In the IPRs, Samsung identified the corresponding structure not as a processor programmed with an algorithm but as a processor <u>and H-bridge switch</u> programmed with an algorithm, where step (3) of the algorithm was presented in the IPRs as "provide a corresponding output to the <u>H-bridge switch</u>" rather than "provide a corresponding output to the driving component," as Samsung proposes here. *E.g.*, Forlines Decl. ¶¶ 112-113; Ex. 10 ('081 IPR Petition) at 7. Samsung's inconsistency across proceedings only further demonstrates that its proposal here is unprincipled. Because RevelHMI's steps (a) and (b) are sufficient to perform the claimed function—whereas Samsung's step (3) is unnecessary—the law is clear that RevelHMI's proposal should be adopted.

RevelHMI maintains that its two-step algorithm is sufficient to perform the claimed function. However, if the Court were to find that three steps are necessary to perform the function, RevelHMI respectfully submits that the Court should adopt RevelHMI's alternative proposed algorithm, which matches exactly what Samsung proposed in its IPR petitions. *E.g.*, Ex. 10 at 7. This alternative of Samsung's IPR proposal is more consistent with the specification than

Samsung's proposal here, in that step (3) of the IPR proposal involves the processor providing an output to an H-bridge switch rather than to the driving component. *See, e.g.*, '081 patent at 6:31-33 ("The H-bridge switch 620 receives a control-signal input d 622 from the CPU."), Fig. 6.

* * *

Accordingly, the Court should find that the disclosed oscillator circuit and microcontroller are sufficient for performing the claimed function and do not require any algorithm, and that the algorithm for general-purpose processor structures does not require an additional step of the processor providing an output to the driving component.

I. "wherein the control component receives output signals from sensors within the [linear] vibration module during operation of the [linear] vibration module and adjusts one or more operational control outputs of the control component according to the received output signals from the sensors" ('081 and '830 patents, claim 3)

RevelHMI's Proposal	Samsung's Proposal
Subject to 35 U.S.C. 112 ¶ 6. **Function**: receiving output signals from sensors within the [linear] vibration module during operation of the [linear] vibration module and adjusting one or more operational control outputs of the control component according to the received output signals from the sensors **Structures**: **oscillator circuit; microcontroller with internal or external memory;** processor; **CPU; microprocessor;** and equivalents thereof [if an algorithm is required] Where the corresponding structure is a processor, CPU, or microprocessor, the processor/CPU/microprocessor is programmed with an algorithm comprising the following steps: **(a) receive the value of an output signal; (b) compare that value to a different value, which could be a previous value**; and (c) adjust one or more operational control outputs based on that comparison *See, e.g.*, '081 patent at 7:13-18, 7:32-8:9, Figs. 7A,	Subject to 35 U.S.C. 112 ¶ 6. **Function**: receiving output signals from sensors within the [linear] vibration module during operation of the [linear] vibration module and adjusting one or more operational control outputs of the control component according to the received output signals from the sensors **Structures**: **Claim 1 structure with the processor further programmed with an algorithm to perform the following steps: (1) convert the received output signal into an integer, (2) compare that integer to a specific value**, (3) adjust one or more operational control outputs based on that comparison. '081 Patent, 7:13-18, 7:32-8:9, Figs. 7A, 7B; '830 Patent, 7:23-29, 7:42-8:19, Figs. 7A, 7B.

RevelHMI's Proposal	Samsung's Proposal
7B; '830 patent at 7:23-28, 7:42-8:19, Figs. 7A, 7B	

Samsung seeks to narrow this claim term by requiring an algorithm with steps that are unnecessary for performing the claimed function. *See* Hooper Decl. ¶¶ 53-57. Samsung's proposal should be rejected, and RevelHMI's proposal should be adopted.

As an initial matter, two of the parties' disputes described above with respect to the "control component" of claim 1 also apply to claim 3. For the reasons above, the corresponding structure of claim 3 includes an oscillator circuit and a microcontroller, and neither is a general-purpose computer requiring a corresponding algorithm. *See supra* Sections IV.H.1, IV.H.2.

In addition, the parties dispute whether the corresponding algorithm (for the disclosed processor, microprocessor, and CPU) requires converting a received output signal into an integer. Samsung seeks to require that the processor convert an output signal into an integer and then compare that integer to a specific value. But a POSITA would readily understand that converting to an integer is not a necessary step for performing the claimed function of "receiv[ing] output signals from sensors within the [linear] vibration module during operation of the [linear] vibration module and adjust[ing] one or more operational control outputs of the control component according to the received output signals from the sensors"—which says nothing at all about integers. Hooper Decl. ¶ 57. For example, the output signal could already be an integer, such that conversion would be unnecessary even if only integer comparisons could be made. And of course, integers are not the only quantities that can be compared. For example, the output signal could be a floating point number instead of an integer, and it could be readily compared to another floating point number without any conversion to integers. Forlines Tr. at 96:15-97:1 (agreeing that "you can compare two floating point numbers," which are not integers).

There is simply no requirement that values be represented as integers in order to make the

claimed comparison. Instead, receiving an output signal, storing its value in a variable, and comparing that variable to a value is sufficient for performing the claimed function. The output signal need not be converted to an integer to accomplish this. Hooper Decl. ¶ 57. Accordingly, the unnecessary step of integer conversion must be excluded from the algorithm. *See, e.g.*, *Univ. of Pitt.*, 561 F. App'x at 941; *Northrop Grumman*, 325 F.3d at 1352; *Micro Chem.*, 194 F.3d at 1258.

J. "wherein the control component adjusts the one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of the [linear] vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters" ('081 and '830 patents, claim 4)

RevelHMI's Proposal	Samsung's Proposal
Subject to 35 U.S.C. 112 ¶ 6. **Function**: adjusting the one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of the [linear] vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters **Structures**: Same structure as described above with respect to claim 3.	Subject to 35 U.S.C. 112 ¶ 6. **Function**: adjusting the one or more operational control outputs of the control component according to the received output signals from the sensors in order that subsequent operation of the [linear] vibration module produces desired outputs from the one or more sensors corresponding to one or more operational control parameters **Structures**: Claim 1 structure with the processor further programmed with the same claim 3 algorithm.

With respect to claim 4, the parties agree on the claimed function and agree that the corresponding structure of claim 3 is the same as the corresponding structure of claim 4. However, as described above, Samsung's proposed structure for claim 3 is improperly narrow. *See supra* Section IV.I; Hooper Decl. ¶¶ 53-59. For the same reasons described above with respect to claim 3, RevelHMI's proposal for claim 4 should likewise be adopted. *Id.*

K. "wherein the one or more operational control parameters is a strength of vibration produced by the [linear] oscillation of the moveable component; and wherein the one or more operational control outputs is a frequency at

which the control component drives the moveable component to [linearly] oscillate, the control component dynamically adjusting the power supplied to the driving component to produce [linear] oscillation of the movable component at a resonant frequency for the linear vibration module" ('081 and '830 patents, claim 5)

RevelHMI's Proposal	Samsung's Proposal
Subject to 35 U.S.C. § 112 ¶ 6. **Function**: dynamically adjusting the power supplied to the driving component to produce [linear] oscillation of the movable component at a resonant frequency for the [linear] vibration module **Structures**: **oscillator circuit; microcontroller with internal or external memory;** processor; **CPU; microprocessor;** and equivalents thereof [if an algorithm is required] Where the corresponding structure is a processor, CPU, or microprocessor, the processor/CPU/microprocessor is programmed with an algorithm comprising the following steps: **(a) if the frequency at which the device operates has been increasing and the vibrational force is greater than the previously sensed vibrational force, then increase the frequency—otherwise if the vibrational force is less than the previously sensed vibrational force, then decrease the frequency; and (b) if the frequency at which the device operates has not been increasing and the vibrational force is greater than the previously sensed vibrational force, then decrease the frequency—otherwise if the vibrational force is less than the previously sensed vibrational force, then increase the frequency**	Subject to 35 U.S.C. 112 ¶ 6. **Function**: **Claim 4 function wherein the one or more operational control parameters is a strength of vibration produced by the [linear] oscillation of the moveable component; and wherein the one or more operational control outputs is a frequency at which the control component drives the moveable component to [linearly] oscillate, the control component** dynamically adjusting the power supplied to the driving component to produce [linear] oscillation of the movable component at a resonant frequency for the [linear] vibration module **Structures**: **Claim 1 structure with the processor further programmed according to the "default" algorithm illustrated in Figure 7B which comprises the following steps: (1) storing sensor input representing the current vibrational force in a variable; (2) checking a previously set variable to determine if the rate of oscillation of the movable component is increasing; (3) if the rate of oscillation of the movable component is increasing and the vibrational force is greater than the previously measured vibrational force, increasing the rate of oscillation of the movable component, otherwise decreasing the rate of oscillation of the movable component; and (4) if the rate of oscillation of the movable component is not increasing and the vibrational force is greater than the previously measured vibrational force, decreasing the rate of oscillation of the movable component, otherwise increasing the rate of oscillation of the movable component**.

RevelHMI's Proposal	Samsung's Proposal
See, e.g., '081 patent at 7:38-42, 7:50-8:9, Fig. 7B; '830 patent at 7:48-52, 7:60-8:19, Fig. 7B	'081 Patent, 7:38-42, 7:50-8:9, Fig. 7B; '830 Patent, 48-52, 7:60-8:19, Fig. 7B.

Samsung's proposed construction improperly seeks to narrow the scope of claim 5 by adding non-functional language to the scope of the claimed function and by adding unnecessary steps to the algorithm for performing the claimed function. Samsung's proposal should be rejected, and RevelHMI's proposal should be adopted. *See* Hooper Decl. ¶¶ 60-64. Notably, Samsung did not even argue in its IPR petitions that claim 5 includes means-plus-function limitations subject to 35 U.S.C. § 112 ¶ 6. *E.g.*, Ex. 10 at 7-8; Ex. 11 at 7-8. This inconsistency in Samsung's positions demonstrates that its arguments here are unprincipled, as they presumably would have been made in Samsung's IPR petitions if they were meritorious.

As with claim 3, two of the parties' disputes described above with respect to the "control component" of claim 1 also apply to claim 5. For the reasons described above, the corresponding structure of claim 5 includes an oscillator circuit and a microcontroller, and neither is a general-purpose computer requiring a corresponding algorithm. *See supra* Sections IV.H.1, IV.H.2.

With respect to the claimed function, Samsung should not be permitted to add non-functional requirements that do not implicate 35 U.S.C. § 112 ¶ 6. The parties agree that the control component "dynamically adjust[s] the power supplied to the driving component to produce [linear] oscillation of the movable component at a resonant frequency for the [linear] vibration module." *E.g.*, '081 patent at cl. 5. But Samsung additionally seeks to incorporate two "wherein" clauses into the claimed function, even though they do not recite additional function for the control component to perform. Hooper Decl. ¶ 60. Instead, they merely describe operational control parameters and operational control outputs. As shown in the table above, the first wherein clause in Samsung's proposal does not even refer to the control component. And the second wherein

clause only refers to the control component where it states "at which the control component drives the moveable component to [linearly] oscillate." And claim 1 of each asserted patent already recites "a control component that controls supply of power from the power supply to the driving component to cause the moveable component to oscillate." '081 and '830 patents at cl. 1. As Dr. Hooper explains, this means that "claim 1 already refers to the control component driving the moveable component to oscillate, such that [Samsung's] second wherein clause does not supply any additional function of 'control component.'" Hooper Decl. ¶ 60.

At deposition, Samsung's expert struggled to explain why these wherein clauses should be included in the claimed function. For example, Dr. Forlines was asked to confirm that the first wherein clause does not recite any new function beyond that of claim 4, to which he responded: "I would say the function is, you know, digesting this, you know, input, you know, for the purpose of, you know -- well, you know, the control of the frequency of oscillation." Forlines Tr. at 107:5-24. Of course, there was no way to explain this because the wherein clauses do not recite additional functionality. The non-functional wherein clauses should be omitted from the claimed function.

With respect to structure, Samsung seeks to incorporate an erroneous proposed construction described above, and add two algorithm steps that are unnecessary for performing the claimed function. Comparing RevelHMI's steps (a) and (b) to Samsung's steps (3) and (4), the parties mostly agree as to how the claimed function is performed. However, Samsung's steps (3) and (4) incorporate Samsung's erroneous proposed construction of "frequency" (i.e., rate of oscillation), so RevelHMI's steps (a) and (b) should be adopted for that reason. *See supra* Section IV.B (describing why Samsung's construction of "frequency" should be rejected). Beyond those steps, Samsung's proposed algorithm also adds (1) storing sensor input representing the current vibrational force in a variable; and (2) checking a previously set variable to determine if the rate

of oscillation of the movable component is increasing. A POSITA would appreciate that these are not necessary steps for performing the claimed function of "dynamically adjusting the power supplied to the driving component to produce [linear] oscillation of the movable component at a resonant frequency for the [linear] vibration module." Hooper Decl. ¶ 64.

The claimed function can be fully performed by RevelHMI's algorithm, such that Samsung's prefatory steps (1) and (2) add unnecessary restrictions about specific quantities and how specifically they must be stored and checked to make the comparisons that the parties agree make up the corresponding algorithm. A POSITA would be able to implement the comparisons of RevelHMI's steps (a) and (b)—or Samsung's steps (3) and (4), for that matter—without the additional restrictions of Samsung's steps (1) and (2), making those prefatory steps unnecessary for performing the claimed function. Accordingly, the Court should exclude from the algorithm the unnecessary steps of (1) storing sensor input representing the current vibrational force in a variable, and (2) checking a previously set variable to determine if the rate of oscillation of the movable component is increasing. *See, e.g.*, *Univ. of Pitt.*, 561 F. App'x at 941; *Northrop Grumman*, 325 F.3d at 1352; *Micro Chem.*, 194 F.3d at 1258.

L. "wherein the one or more operational control parameters include both a strength of vibration produced by the linear oscillation of the moveable component and a current operational mode; and wherein the one or more operational control outputs is a control output that determines a current supplied by the power supply to the driving component and a frequency at which the control component drives the moveable component to [linearly] oscillate" ('081 and '830 patents, claim 6)

RevelHMI's Proposal	Samsung's Proposal
Plain and ordinary meaning; **not subject to 35 U.S.C. § 112 ¶ 6; not indefinite**. If subject to 35 U.S.C. § 112 ¶ 6 and Samsung's function is accepted, then:	**Subject to 35 U.S.C. 112 ¶ 6**. **Function**: Claim 4 function wherein the one or more operational control parameters include both a strength of vibration produced by the

RevelHMI's Proposal	Samsung's Proposal
Structures: **oscillator circuit; microcontroller with internal or external memory; processor; CPU; microprocessor; and equivalents thereof** [if an algorithm is required] **Where the corresponding structure is a processor, CPU, or microprocessor, the processor/CPU/microprocessor is programmed with an algorithm comprising the following steps: (a) set the mode and strength to [default values or] values representing selections made by user input to the user input features; and (b) provide a corresponding output to the power supply so that the power supply provides a corresponding current to the driving component** '081 patent at 7:10-24, 8:10-20, Figs. 7A, 7C; '830 patent at 7:20-34, 8:20-30, Figs. 7A, 7C	[linear] oscillation of the moveable component and a current operational mode; and wherein the one or more operational control outputs is a control output that determines a current supplied by the power supply to the driving component and a frequency at which the control component drives the moveable component to [linearly] oscillate. **Structures**: **Indefinite**.

Claim 6 does not recite any new functionality beyond that of claims 1 and 4, from which claim 6 depends. This means claim 6 is not subject to 35 U.S.C. § 112 ¶ 6, which should end the analysis. However, should the Court accept Samsung's proposed function find that Section 112(6) applies, then the specification discloses sufficient structure to a POSITA for performing the claimed function, thus defeating Samsung's indefiniteness argument. *See* Hooper Decl. ¶¶ 65-71.

1. Claim 6 is not subject to 35 U.S.C. § 112 ¶ 6

The challenged term is presumptively not a means-plus-function term because it does not recite "means." *Dyfan*, 28 F.4th at 1365. Samsung cannot overcome this presumption because claim 6 does not fail to recite sufficiently definite structure, nor does it recite function without sufficient structure for performing that function. *Id.* Claim 6 does not recite additional function and does not even mention "control component" until the last few words of the claim, where it recites "at which the control component drives the moveable component to [linearly] oscillate." But claim 1 of each asserted patent already recites "a control component that controls supply of power from the power supply to the driving component to cause the moveable component to

oscillate." '081 and '830 patents at cl. 1. Because claim 1 already refers to the control component driving the moveable component to oscillate, dependent claim 6 does not supply any additional function that could even possibly invoke 35 U.S.C. § 112 ¶ 6. It is not a means-plus-function term.

As with claim 5, Samsung also did not argue in its IPR petitions that claim 6 includes means-plus-function limitations subject to 35 U.S.C. § 112 ¶ 6. *E.g.*, Ex. 10 at 7-8; Ex. 11 at 7-8. This inconsistency in Samsung's positions again shows that its argument here lacks merit.

2. Even if 35 U.S.C. § 112 ¶ 6 does apply, the specification discloses sufficient structure for performing Samsung's proposed function

If the Court accepts Samsung's proposed function and finds that § 112 ¶ 6 does apply to claim 6, Samsung's indefiniteness argument should still be rejected because the specification discloses corresponding structure to a POSITA. Specifically, the corresponding structures would be the same structures described above with respect to claims 1 and 4 (from which claim 6 depends), including equivalents thereof. Hooper Decl. ¶¶ 67, 71; *supra* Sections IV.H.4, IV.J. Samsung's indefiniteness argument should therefore be rejected. *See, e.g.*, *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1279-80 (Fed. Cir. 2012) ("As long as a sufficient algorithm describing how a general-purpose computer will perform the function is disclosed, reference to such general-purpose processors will suffice to overcome an indefiniteness challenge."). Samsung cannot meet the heavy burden of proving indefiniteness by clear and convincing evidence. *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1376-77 (Fed. Cir. 2001) ("Thus, a challenge to a claim containing a means-plus-function limitation as lacking structural support requires a finding, by clear and convincing evidence, that the specification lacks disclosure of structure sufficient to be understood by one skilled in the art as being adequate to perform the recited function.").

V. CONCLUSION

For the foregoing reasons, RevelHMI's proposed constructions should be adopted.

Date: December 21, 2023

/s/ Reza Mirzaie

Reza Mirzaie
California Bar No. 246953
rmirzaie@raklaw.com
Kristopher Davis
California Bar No. 329627
kdavis@raklaw.com
Christian W. Conkle
California Bar No. 306374
cconkle@raklaw.com
Jason Wietholter
California Bar No. 337139
jwietholter@raklaw.com
Paul A. Kroeger
California Bar No. 229074
kroeger@raklaw.com
Qi Tong
California Bar No. 330347
ptong@raklaw.com
RUSS AUGUST & KABAT
12424 Wilshire Blvd. 12th Floor
Los Angeles, CA 90025
Phone: (310) 826-7474
Facsimile: (310) 826-6991

Attorneys for Plaintiff
Resonant Systems, Inc. d/b/a RevelHMI

CERTIFICATE OF SERVICE

I hereby certify that counsel of record who are deemed to have consented to electronic service are being served on December 21, 2023, with a copy of this document via the Court's CM/ECF.

/s/ Reza Mirzaie
Reza Mirzaie