

# United States Court of Appeals for the Federal Circuit

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**ALFRED E. MANN FOUNDATION FOR  
SCIENTIFIC RESEARCH,  
ADVANCED BIONICS, LLC,**  
*Plaintiffs-Cross-Appellants*

v.

**COCHLEAR CORPORATION, NKA COCHLEAR  
AMERICAS, COCHLEAR LTD.,**  
*Defendants-Appellants*

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2015-1580, 2015-1606, 2015-1607

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Appeals from the United States District Court for the  
Central District of California in No. 2:07-cv-08108-FMO-  
SH, Judge Fernando M. Olguin.

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Decided: November 17, 2016

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Before NEWMAN, CHEN, and HUGHES, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* HUGHES.

Opinion concurring in part, dissenting in part filed by  
*Circuit Judge* NEWMAN.

HUGHES, *Circuit Judge*.

The Alfred E. Mann Foundation for Scientific Research sued Cochlear Corporation and Cochlear Ltd. for infringing claims 1 and 10 of U.S. Patent No. 5,609,616 and claims 6–7 of U.S. Patent No. 5,938,691, which cover implantable cochlear stimulators. After conducting a jury trial and a bench trial on separate issues, the district court entered judgment finding claim 10 of the '616 patent infringed and claim 1 of the '616 patent and claims 6–7 of the '691 patent invalid for indefiniteness. The court also granted Cochlear's JMOL of no willful infringement and its motion for a new trial on damages. Both parties appeal. Because we find that the district court did not err in its infringement determination or in finding claims 6–7 indefinite, but did err in finding claim 1 indefinite, we affirm-in-part and reverse-in-part. We vacate and remand the district court's determination regarding willfulness in light of the Supreme Court's decision in *Halo Electronics, Inc. v. Pulse Electronics, Inc.*, 579 U.S. \_\_\_, 136

S. Ct. 1923 (2016). We also conclude that we do not have jurisdiction over the damages issue.

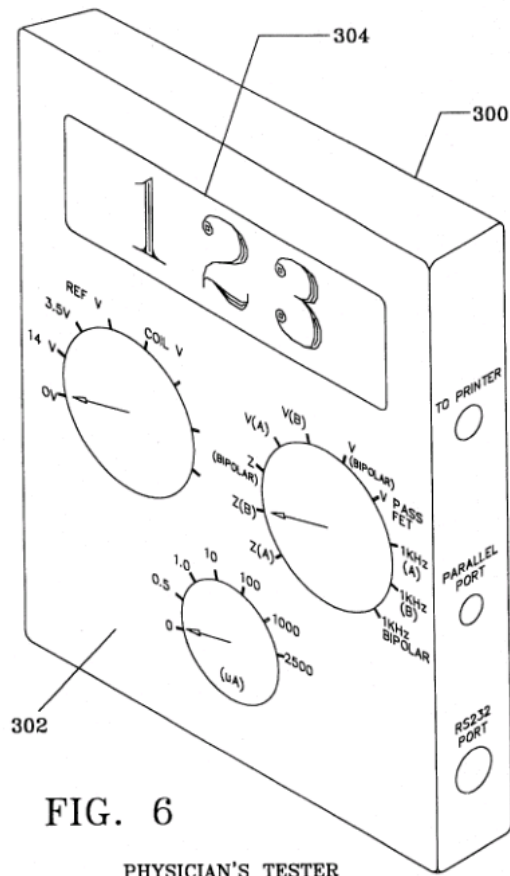
## I

The Alfred E. Mann Foundation for Scientific Research (The Foundation) owns the '616 and '691 patents, and formed Advanced Bionics, LLC (Advanced Bionics) to manufacture implants. The Foundation sued Cochlear Corporation and Cochlear Ltd. (Cochlear) for infringing the '616 and '691 patents, and Advanced Bionics was later added as an involuntary plaintiff. Claims 1 and 10 of the '616 patent and claims 6–7 of the '691 patent are at issue in this appeal.

The patents are directed to an ear implant with telemetry functionality for testing purposes, and generally describe a two-part system comprising an external wearable system with a wearable processor (WP) and headpiece, and an internal implantable cochlear stimulator (ICS). Sound is transmitted from the headpiece to the WP, which processes the transmissions before sending them to the ICS. The ICS processes the sound to stimulate the cochlea—the organ that converts sound to nerve impulses—via implanted electrodes, thereby allowing the user to hear. *See* '616 patent, col. 3 ll. 10–24.<sup>1</sup> In addition, the system allows testers, usually physicians, to measure and adjust various parameters of the implant to assess whether the device is functioning properly. *Id.* at col. 32 ll. 34–54. The tester may observe the implant's functionality through the “physician's tester.” As depicted in Figure 6, the physician's tester is a modification of the previously described WP. *Id.* at col. 51–55.

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<sup>1</sup> The patents share substantially the same specification.



The tester may interact with the ICS by adjusting various knobs on the control panel 302, such that the physician's tester measures and displays different parameters on visual display 304. *Id.* at col. 32 l. 65–col. 33 l. 18. Table 7 of the patents describes “typical parameter settings” for the control knobs, which in turn dictate the parameters that are measured and displayed. *Id.* at col. 33 ll. 14–24. These parameter settings include impedance, voltage, and output current. *Id.* at col. 33 ll. 26–54.

Cochlear's accused system includes an implant with a pair of electrodes, a speech processor worn behind the patient's ear, and diagnostic software used to test the

implant. After a physician inserts the implant and electrodes, he can use the diagnostic software to send stimulation signals through the electrodes and determine the impedance, which is the resistance to electrical current. The accused system displays the results of the impedance testing by depicting the electrodes as either red or green, where an electrode displayed in red indicates that the electrode has a circuit condition. In addition to displaying a red or green electrode, Cochlear's system may also display the calculated impedance value. Cochlear's system does not display the measured voltage across the two electrodes.

On January 23, 2014, the jury found that Cochlear willfully infringed claims 1 and 10 of the '616 patent and claims 6–7 of the '691 patent. The jury also found that all of the asserted claims were not invalid under §§ 102 or 103. The jury awarded approximately \$131 million in damages. J.A. 59–70.

On March 31, 2015, the court conducted a bench trial on equitable estoppel, laches, inequitable conduct, prosecution history, and indefiniteness, and determined that all of the asserted claims except for claim 10 of the '616 patent were invalid for indefiniteness. *Id.* at 47–56. On the same day, the court denied Cochlear's JMOL of noninfringement as to claim 10 of the '616 patent, granted Cochlear's JMOL of no willful infringement, and granted Cochlear's motion for a new trial on damages. *Id.* at 10–24.

Cochlear appeals the court's denial of its JMOL of noninfringement as to claim 10 of the '616 patent. The Foundation and Advanced Bionics (collectively, Cross-Appellants) appeal the court's indefiniteness findings as to claim 1 of the '616 patent and claims 6–7 of the '691 patent, grant of Cochlear's JMOL of no willful infringement, and grant of Cochlear's motion for a new trial on

damages. We have jurisdiction under 28 U.S.C. § 1295(a)(1).

## II

We first address the district court's denial of Cochlear's JMOL of noninfringement of claim 10 of the '616 patent. We review the denial of a motion for judgment as a matter of law under the law of the regional circuit. *Verizon Servs. Corp. v. Cox Fibernet Va., Inc.*, 602 F.3d 1325, 1331 (Fed. Cir. 2010). The Ninth Circuit reviews the district court's denial de novo. *Rivero v. City & Cty. of San Francisco*, 316 F.3d 857, 863 (9th Cir. 2002). Judgment as a matter of law is appropriate where there is no legally sufficient evidentiary basis for a reasonable jury to find for the party on that issue. Fed. R. Civ. P. 50(a)(1). Cochlear raises two arguments on appeal: first, the district court erred in construing claim 10, and second, even under the district court's construction, Cochlear's accused system does not infringe. We address each of these arguments in turn.

## A

Cochlear argues that claim 10 of the '616 patent requires that an infringing system must display the voltage between two electrodes. Cochlear Br. at 31–32. We review claim construction de novo, and underlying factual determinations concerning extrinsic evidence for clear error. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. \_\_\_, 135 S. Ct. 831, 841 (2015). We do not find Cochlear's arguments persuasive based on the claim language, specification, and prosecution history. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313–14 (Fed. Cir. 2005) (en banc).

Claim 10 of the '616 patent reads, in relevant part:

A method of testing an implantable tissue stimulating system comprising: . . .

[f] selectively monitoring the at least one pair of the multiplicity of electrodes to measure a voltage associated therewith at the same time the stimulation signals are applied thereto;

[g] generating stimulator status-indicating signals representative of the measurements made within the implanted stimulator;

[h] transmitting the stimulator status-indicating signals to an external receiver coupled to the external transmitter;

[i] receiving and processing the status-indicating signals to produce *processed status-indicating signals which convey information regarding the status of the implanted stimulator, including the measurements made within the implanted stimulator*; and

[j] *displaying the processed status-indicating signals, whereby the status of the implanted stimulator, including the results of the measurements made within the implanted stimulator, may be made known.*

'616 patent, col. 35 l. 43–col. 36 l. 7 (emphases added).

Cochlear first argues that voltage measurements must be included in the processed status-indicating signals because part (i) of the claim states that “processed status-indicating signals . . . convey information . . . *including the measurements made within the implanted stimulator.*” See Cochlear Br. at 36 (emphasis added). Cochlear reasons that part (i) “does not permit processing that calculates impedance values from the voltage measurements without maintaining the voltage measurements

for display.” *Id.* We find Cochlear’s argument unpersuasive in light of the claim language as a whole.

While it is true that the “measurements made within the implanted stimulator” in part (i) are the voltage measurements according to the plain language of the claim and the court’s construction, *see* J.A. 13, part (g) defines the *pre*-processed status-indicating signals as merely “representative” of these measurements, *see* ’616 patent, col. 35 ll. 60–62. According to part (i), the signals described in part (g) are *further* processed such that they only “convey information regarding the status of the implanted stimulator.” *Id.* at col. 35 l. 66–col. 36 l. 3. Parts (g) and (i) together make clear that the status-indicating signals, regardless of whether they are processed or not, only have to convey information *about* the voltage measurements, but do not require such information to be displayed. Furthermore, Cochlear’s construction would require us to find that to “convey” the voltage measurements, the signals in part (i) must “display” this information. There is no intrinsic support for this definition, which would also render part (j) redundant under Cochlear’s proposed construction. *Merck & Co. v. Teva Pharm. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) (“A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.”).

Cochlear next argues that the “whereby” clause in part (j) is material to patentability such that voltage must be made available for display. Cochlear Br. at 38. The district court determined that the “whereby” clause merely provides a more illustrative expression of the “displaying the status-indicating signals” limitation, and provides no additional restrictions on the claim. J.A. 26436. We agree. There is no support for Cochlear’s construction, particularly because parts (g) and (i) of claim 10 make clear that the processed status-indicating signals only have to convey information about the voltage measure-



ments, but do not have to include the measurements for display. In addition, Cochlear's construction would require us to find that the term "may be made known" means "available for display." There is no support for this interpretation, particularly because the limitation states that only the processed status-indicating signals must be displayed.

Cochlear's proposed construction also conflicts with the specification. As depicted in Figure 6, the control knob 308 (the right most knob) is one of three knobs that dictate "the parameters measured and displayed by the ICS and Physician's Tester combination." '616 patent, col. 33 ll. 14–18. Positions 1–3 correspond to the impedance, and are distinct from positions 4–7, which correspond to the voltage. *Id.* at ll. 36–40 (Table 7). Because the specification envisions that impedance, voltage, or the current may be displayed, the voltage measurement does not have to be displayed as Cochlear argues.

The prosecution history also does not support Cochlear's proposed claim construction. In response to a § 112 rejection, the patentee amended "voltages/current" to "voltage" in part (f), and in response to a § 103 rejection, added parts (i) and (j). J.A. 15834–35. Cochlear argues that the applicant made this amendment to specify that the voltage must be displayed. Cochlear Br. at 38. But, it is clear that the patentee amended the claim to distinguish the invention from the prior art based on its real-time testing abilities. *See* J.A. 15843–44 (noting that the invention allowed a physician to perform real-time testing, where a sensed parameter (voltage) "is sent back to the physician's tester as part of a feedback signal were [sic] it is displayed or otherwise processed. Such action thereby provides, in effect, a 'snapshot', in real time, of the selected parameter . . ."). Though the Examiner allowed the claim because "the prior art does not show or suggest the measuring of the electrode voltage for external display," *id.* at 15850, an examiner's unilateral state-

ment does not give rise to a clear disavowal of claim scope by the applicant, *see Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir. 2005). Here, the patentee did not argue that the voltage must be displayed, instead focusing its arguments on the real-time features of the invention.

In light of the intrinsic evidence, we reject Cochlear’s proposed claim construction.

### B

Cochlear argues that even under the district court’s construction, its accused system does not infringe. Infringement is a question of fact that we review for substantial evidence when tried to a jury. *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1309 (Fed. Cir. 2009). Cochlear asserts that even though its system may display the impedance value, the voltage value is not “made known” as required by part (j) of claim 10. Cochlear’s Br. at 43–44. The relationship between voltage, impedance, and current is defined by Ohm’s Law, where voltage = current x impedance. Because there is sufficient evidence that the accused system sets forth the current level associated with each measurement, J.A. 4700, and voltage may be measured by multiplying the current level by the accused system’s displayed impedance value, there is substantial evidence that Cochlear’s accused system infringes claim 10.

### III

We next turn to Cross-Appellants’ cross-appeal on the court’s indefiniteness determinations. The ultimate determination of indefiniteness is a question of law that we review de novo, although any factual findings by the district court based on extrinsic evidence are reviewed for clear error. *UltimatePointer, LLC v. Nintendo Co.*, 816 F.3d 816, 826 (Fed. Cir. 2016).

To satisfy the definiteness requirement, a means-plus-function claim requires sufficient disclosure of the underlying structure. That task lies with the patentee. *E.g.*, *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003) (“The duty of a patentee to clearly link or associate structure with the claimed function is the quid pro quo for allowing the patentee to express the claim in terms of function under section 112, paragraph 6.”) (citing *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1377 (Fed. Cir. 2001)); *Valmont Indus., Inc. v. Reinke Mfg. Co.*, 983 F.2d 1039, 1042 (Fed. Cir. 1993) (“The applicant must describe in the patent specification some structure which performs the specified function.”). In cases involving a computer-implemented invention, we have held that the structure must be more than a general purpose computer or a microprocessor, *Aristocrat Techs. Austl. Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008), unless, in the rare circumstance, any general purpose computer without any special programming can perform the function, *see Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1365 (Fed. Cir. 2012). Where the structure is a general purpose computer or microprocessor, “[r]equiring disclosure of an algorithm properly defines the scope of the claim and prevents pure functional claiming.” *Ergo*, 673 F.3d at 1364. An “algorithm” is “a step-by-step procedure for accomplishing a given result,” and may be expressed “in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.” *Id.* at 1365 (citations and internal quotation marks omitted). “Claim definiteness . . . depends on the skill level of a person of ordinary skill in the art. In software cases, therefore, algorithms in the specification need only disclose adequate defining structure to render the bounds of the claim understandable to one of ordinary skill in the art.” *AllVoice Computing PLC v. Nuance Commc’ns, Inc.*,

504 F.3d 1236, 1245 (Fed. Cir. 2007) (internal citations omitted).

A

Claim 6 of the '691 patent reads, in relevant part:

A cochlea stimulation system, comprising:

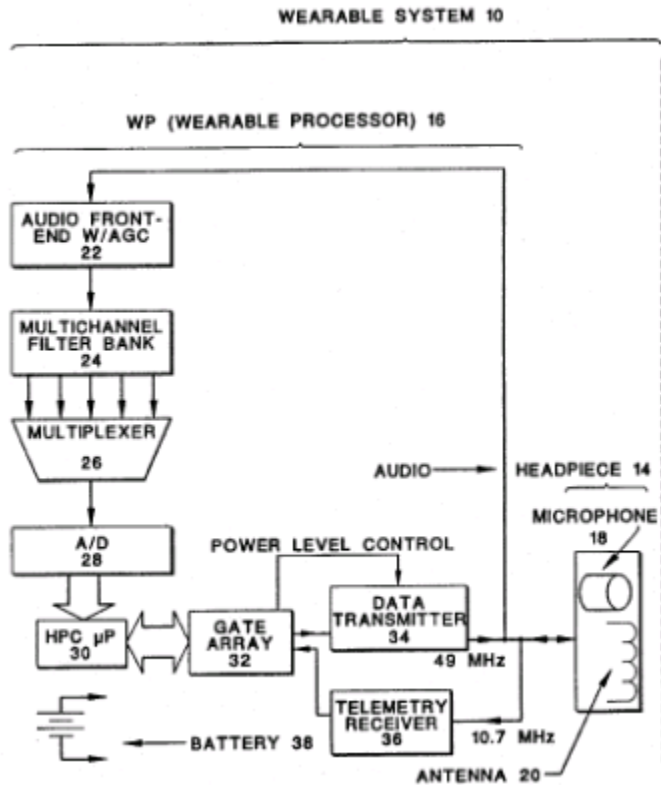
[a] audio signal receiving means;

[b] an externally wearable signal processor (WP) for receiving and processing the audio signals received by the audio signal receiving means and including *means for generating data indicative of the audio signal; . . . .*

'691 patent, col. 34 l. 51–col. 35 l. 6 (emphasis added).

Claim 7 of the '691 patent is dependent on claim 6, and the reproduced portion of claim 6 is the only part relevant here.

The limitation “means for generating data indicative of the audio signal” is a means-plus-function limitation. Cross-Appellants do not dispute that the function is “generating data indicative of the audio signal,” and the corresponding structure is a microprocessor. *See* J.A. 53; Foundation Br. at 54; Advanced Bionics Br. at 20–21. A portion of Figure 1, depicting the wearable system 10, is reproduced below, where structure 30 is the microprocessor.



The district court found claims 6–7 indefinite because the specification of the '691 patent fails to disclose the requisite algorithmic structure to perform the “means for generating data indicative of the audio signal” function. J.A. 53–56. Cross-Appellants argue that the claims are not indefinite because the “microprocessor implements a logarithmic conversion algorithm to generate data indicative of an audio signal.” J.A. 54. According to Cross-Appellants, the algorithm performed by the microprocessor has two steps: first, the microprocessor receives digital data from the A/D converter 28, and second, the microprocessor uses a logarithmic conversion function to format the data. J.A. 33657. The district court found the claims indefinite because the '691 patent does not disclose where the logarithmic conversion function takes place and because the logarithmic conversion function could be

implemented through multiple logarithmic algorithms, none of which the specification describes. J.A. 54–55. We agree that the claims are indefinite for these reasons.

Cross-Appellants argue that the logarithmic conversion must be performed in the microprocessor. Foundation Reply Br. 6. This argument conflicts with the testimony of both experts. Dr. Robert Stevenson, Cochlear’s expert, explained that the logarithmic conversion could be placed in the A/D convertor, or “[a]lternatively[,] you could put this algorithm into the microprocessor.” J.A. 2596, ll. 11–15. Dr. Darrin J. Young, Cross-Appellants’ expert, testified that “[t]he patent doesn’t say that” the logarithmic conversion must be done in the microprocessor, J.A. 2617 ll. 2–4, and agreed that “[y]ou could implement a logarithmic function into the [A/D] converter.” J.A. 2616, ll. 13–15. Since the patent does not disclose which component performs the logarithmic conversion function, the specification does not disclose “with sufficient particularity the corresponding structure for performing the claimed function . . . .” *Triton Tech of Tex., LLC v. Nintendo of Am., Inc.*, 753 F.3d 1375, 1378 (Fed. Cir. 2014); *see also In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1315 (Fed. Cir. 2011); *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1385 (Fed. Cir. 2009) (“The question before us is whether the specification contains a sufficiently precise description of the ‘corresponding structure’ to satisfy section 112, paragraph 6, not whether a person of skill in the art could devise some means to carry out the recited function.”).

These claims are indefinite for another reason: the logarithmic conversion may be implemented through various unspecified algorithms. In describing some additional possible algorithms, Dr. Young testified that

logarithmic conversions could be implemented using a binary logarithmic algorithm or a lookup table.<sup>2</sup> J.A. 2618, ll. 12–19. According to Dr. Young, the only limit on the number of algorithms that could be used was how “complicated you want to make the logarithmic function.” J.A. 2617, ll. 5–9. For instance, Dr. Young testified that a logarithmic function implemented in the A/D converter would not be simple but would have “multiplication factors” that would “need[] to be programmed.” J.A. 2616, ll. 13–21.

As the testimony reflects, the ’691 patent does not disclose an algorithm, or even a small set of algorithms for performing the claimed logarithmic conversion function. “Disclosing the broad class of [logarithmic conversion] does not limit the scope of the claim to the ‘corresponding structure, material, or acts’ that perform the function, as required by Section 112.” *Triton Tech.*, 753 F.3d at 1379. Although Cross-Appellants argue that a person of ordinary skill in the art would know of potential logarithmic conversion functions to implement, Foundation Br. 59–60, this does not create structure in the patent where there was none to begin with. *Triton Tech.*, 753 F.3d at 1379 (“Although a person of skill in the art might be able to choose an appropriate numerical integration algorithm and program it onto a microprocessor, the [p]atent discloses no algorithm at all.”) (alteration in original). Because the court did not err in finding claims 6–7 indefinite where the specification fails to disclose the requisite

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<sup>2</sup> As the district court noted in evaluating the testimony, this was inconsistent with Dr. Young’s earlier unequivocal declaration that he “kn[e]w of no other way to implement such a logarithmic algorithm in a DSP.” J.A. 55.

structure, we affirm the district court’s indefiniteness finding.

## B

Claim 1 of the ’616 patent reads, in relevant part:

A physician’s testing system for testing a multi-channel cochlear stimulating system, comprising a physician’s tester, an external head-piece/transmitter, and an implanted cochlear stimulator (ICS), . . .

[c] the physician’s tester comprising:

[1] *external processor means* coupled to the transmitting means of the external head-piece/transmitter *for receiving and processing the status-indicating signals to derive information therefrom regarding the operation of the implanted stimulator and its plurality of tissue stimulating electrodes; . . .*

’616 patent, col. 34 ll. 23–61 (emphases added).

The limitation “external processor means . . . for . . . processing the status-indicating signals to derive information therefrom” is a means-plus-function limitation. It is undisputed that the structure is the microprocessor. J.A. 50.

The district court rejected Cross-Appellants’ argument that the patent discloses a two-step algorithm, where first, the microprocessor accepts signals representative of voltage, and second, the microprocessor applies Ohm’s law to convert the voltage into an impedance value. *Id.* at 51. The court found claim 1 indefinite because the patent does not explicitly identify Ohm’s law and there are multiple ways of calculating impedance. *Id.* at 52. We disagree.



The specification discloses that both voltage and current are measured, and that these values are associated with the resulting “status-indicating signal.” *See, e.g.*, ’616 patent, col. 32 ll. 36–42 (“[T]he system of the present invention provides for . . . measurement of different voltages and currents within the ICS in response to commands and data changes transmitted by the WP in response to data telemetered back to the WP in the form of status indicating and measurement signals.”). Both parties’ experts testified that a person of ordinary skill would know to apply Ohm’s law to voltage and current to yield impedance values. *See* J.A. 33662 (“[Impedance] is always calculated based on the ratio of voltage to current. One of ordinary skill in the art would readily understand from the disclosure in the ’616 patent that this [sic] the algorithm is implemented. The algorithm for calculating impedance is Ohm’s law, which is famous and well known to a person of ordinary skill in the art.”); *id.* at 2586 at 68:11–18 (“Q: If you know what the current is that’s being applied and you know what the voltage is being measured, then you could use that information to put it into the Ohm’s law equation and calculate impedance; right? A: In this application where you want to do something like this, you could do that. There are other things you could do.”). The specification also discloses that impedance is calculated based on voltage and current. ’616 patent, col. 31 ll. 55–58 (“[B]oth the stimulus voltage and current can be measured and, thereby, the impedance of the electrode and the tissue-electrode interface can be measured and transmitted back to the WP.”). Because there is “adequate defining structure to render the bounds of the claim understandable to one of ordinary skill in the art,” *AllVoice*, 504 F.3d at 1245, we reverse the district court’s indefiniteness finding as to claim 1 of the ’616 patent.

## IV

The jury found that Cochlear willfully infringed claims 1 and 10 of the '616 patent and claims 6–7 of the '691 patent. J.A. 63, 67. The court set this verdict aside in granting Cochlear's JMOL of no willful infringement. The court concluded that a reasonable jury could not find that the objective prong of the *Seagate* inquiry was established by clear and convincing evidence, and that Cochlear had presented several reasonable noninfringement defenses. *Id.* at 18–19. Although the parties stipulated that “Cochlear was aware of the '691 patent and its subject matter by June 2004” and “was aware of the '616 patent and its subject matter by July 2003[,]” *id.* 265, the court determined that the Foundation failed to satisfy the subjective prong because (1) the Foundation did not provide pre-suit notice regarding the '691 patent, and (2) Cochlear responded with reasonable infringement defenses after being notified of the '616 patent, *id.* at 19.

In *Halo*, the Supreme Court rejected the *Seagate* test for willful infringement as “unduly rigid” and “impermissibly encumber[ing] the statutory grant of discretion to district courts.” 136 S. Ct. at 1932 (internal citation and quotation marks omitted). The Court rejected the *Seagate* test's clear-and-convincing standard of proof, as well as the tripartite framework for appellate review. *Id.* at 1934 (“As we explained in *Octane Fitness*, ‘patent-infringement litigation has always been governed by a preponderance of the evidence standard.’” (citing *Octane Fitness, LLC v. ICON Health & Fitness*, 572 U.S. \_\_\_, 134 S. Ct. 1749, 1758 (2014))). The Court also rejected *Seagate*'s requirement of “a finding of objective recklessness in every case before district courts may award enhanced damages.” *Id.* at 1932. “Such a threshold requirement excludes from discretionary punishment many of the most culpable offenders, such as the ‘wanton and malicious pirate’ who intentionally infringes another’s patent—with no doubts about its validity or any notion of a defense—for no pur-

pose other than to steal the patentee’s business.” *Id.* The Court described “[t]he sort of conduct warranting enhanced damages. . . .as willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, [or] flagrant . . . .” *Id.*

Cross-Appellants argue that, at a minimum, we should vacate and remand the court’s grant of JMOL on willfulness in light of *Halo*. We agree. On remand, mindful of *Halo*’s “preponderance of the evidence standard,” 136 S. Ct. at 1934, the court must consider whether Cochlear’s infringement “constituted an ‘egregious case[] of misconduct beyond typical infringement’ meriting enhanced damages under § 284 and, if so, the appropriate extent of the enhancement.” *WesternGeco L.L.C. v. ION Geophysical Corp.*, --- F.3d ---, 2016 WL 5112047, at \*5 (Fed. Cir. Sept. 21, 2016) (quoting *Halo*, 136 S. Ct. at 1934).

Accordingly, we vacate the district court’s determination that Cochlear’s infringement of the Foundation’s patents was not willful and remand for further proceedings.

## V

Lastly, the court ordered a new trial on damages for claim 10 of the ’616 patent and vacated the jury’s damages award. J.A. 23. Cross-Appellants argue that the court abused its discretion in granting Cochlear’s motion. We lack jurisdiction to consider this issue.

Ordinarily, we apply regional circuit law to substantive and procedural issues not “intimately involved in federal patent law.” *Verinata Health, Inc. v. Ariosa Diagnostics, Inc.*, 830 F.3d 1335, 1338 (Fed. Cir. 2016). However, on matters concerning our jurisdiction, “we apply our own law and not the law of the regional circuit.” *Spraytex Inc. v. DJS&T*, 96 F.3d 1377, 1379 (Fed. Cir. 1996); *see also Woodard v. Sage Prods., Inc.*, 818 F.2d 841,

844 (Fed. Cir. 1987) (“[D]eference [to regional circuit law] is inappropriate on issues of our own appellate jurisdiction. This court has the duty to determine its jurisdiction and to satisfy itself that an appeal is properly before it.”).

“By statute, this court has jurisdiction over an appeal of a decision of a district court if it is ‘final’ under 28 U.S.C. § 1295(a)(1) or if it is an interlocutory order as specified in 28 U.S.C. § 1292.” *Orenshteyn v. Citrix Sys., Inc.*, 691 F.3d 1356, 1357 (Fed. Cir. 2012). One exception to the foregoing is when the judgment is final except for an “accounting.” 28 U.S.C. § 1292(c)(2); see *Robert Bosch, LLC v. Pylon Mfg. Corp.*, 719 F.3d 1305, 1309 (Fed. Cir. 2013) (en banc) (holding that an “accounting” may include a trial on damages).

There has not been a final decision on the damages issue. We are not persuaded by Cross-Appellants’ argument that the § 1292(c)(2) exception to the rule of finality applies here. Under *Bosch*, the exception allows us to consider the liability issues in this case, but does not go so far as to permit us to consider the non-final order itself. *Arlington Indus., Inc. v. Bridgeport Fittings, Inc.*, 759 F.3d 1333, 1339 (Fed. Cir. 2014) (“As an exception to the final judgment rule, § 1292(c)(2) is to be interpreted narrowly.”). Clearly, if the parties were only appealing the damages issue, we would not have jurisdiction under § 1295(a)(1). The addition of the liability issues in this case does not change our jurisdictional reach. *Orenshteyn*, 691 F.3d at 1363–64 (dismissing as premature portion of invalidity and sanctions appeal relating to sanctions because the district court had not yet made a final determination regarding the amount of the sanctions).

Cross-Appellants also argue that we have jurisdiction because of the district court’s certification of judgment under Fed. R. Civ. P. 54(b). Foundation Reply Br. 24. The Rule provides in relevant part: “[w]hen an action

presents more than one claim for relief . . . or when multiple parties are involved, the court may direct entry of a final judgment as to one or more, but fewer than all, claims or parties only if the court expressly determines that there is no just reason for delay.” Rule 54(b) was implemented to specifically “avoid the possible injustice of delay[ing] judgment on a distinctly separate claim [pending] adjudication of the entire case.” *Gelboim v. Bank of Am. Corp.* 135 S. Ct 897, 902 (2015) (alterations in original).

There are three prerequisites for invoking Rule 54(b): (1) multiple claims for relief or multiple parties must be involved; (2) at least one claim or the rights and liabilities of at least one party must be finally decided; and (3) the district court must find that there is no just reason for delaying an appeal. 10 Charles Alan Wright et al., *Federal Practice and Procedure* § 2656 (3d ed. 2016). Because “the district court has no discretion to authorize an appeal when Rule 54(b) does not apply, its decision that the requirements of the rule have been met is fully reviewable by an appellate court.” *Id.* at § 2655.

The district court’s entry of judgment on the damages question does not meet the standards of Rule 54(b) because damages have not been finally decided. In *Sears, Roebuck & Co. v. Mackey*, the Supreme Court discussed Rule 54(b):

[I]t does not relax the finality required of each decision, as an individual claim, to render it appealable, but it does provide a practical means of permitting an appeal to be taken from one or more final decisions on individual claims, in multiple claims actions, without waiting for final decisions to be rendered on all the claims in the case.

351 U.S. 427, 435 (1956). The standard for finality under Rule 54(b) is analogous to the standard under 28 U.S.C. § 1291 (or 28 U.S.C. § 1295). *Id.* at 438 (“[Rule 54(b)]

scrupulously recognizes the statutory requirement of a ‘final decision’ under § 1291 as a basic requirement for an appeal to the Court of Appeals. It merely administers that requirement in a practical manner in multiple claims actions and does so by rule instead of by judicial decision.”); *see also* Wright, *Federal Practice and Procedure* § 2656. The Supreme Court has explained that judgments “where assessment of damages or awarding of other relief remains to be resolved have never been considered to be ‘final’” for purposes of Rule 54(b). *Liberty Mut. Ins. Co. v. Wetzel*, 424 U.S. 737, 744 (1976).

The issue of the propriety of the damages award was not properly certified for appeal under Rule 54(b) because the district court ordered a new trial on damages. A new trial is not a final order that falls within Rule 54(b).<sup>3</sup> *See*

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<sup>3</sup> Since the question of what is “final” is sometimes a difficult question, the Supreme Court has cautioned that the requirement of “finality is to be given a ‘practical rather than a technical construction.’” *Gillespie v. United States Steel Corp.*, 379 U.S. 148, 152 (1964) (quoting *Cohen v. Beneficial Indus. Loan Corp.*, 337 U.S. 541, 546 (1949)). But the Supreme Court has noted that “[i]f *Gillespie* were extended beyond the unique facts of that case, § 1291 would be stripped of all significance.” *Coopers & Lybrand v. Livesay*, 437 U.S. 463, 477 n.30 (1978). We have similarly held that the “exception to finality created by *Gillespie* is to be very rarely used beyond the unique facts of that case.” *Spread Spectrum Screening LLC v. Eastman Kodak Co.*, 657 F.3d 1349, 1356–57 (Fed. Cir. 2011) (quoting *Fairchild Republic Co. v. United States*, 810 F.2d 1123, 1126 (Fed. Cir. 1987)). The facts of this case do not fall within the unique circumstances of

*Allied Chem. Corp. v. Daiflon, Inc.*, 449 U.S. 33, 34 (1980) (“An order granting a new trial is interlocutory in nature and therefore not immediately appealable.”). Therefore, because the district court’s judgment does not fall within the scope of Rule 54(b) or § 1292(c)(2)’s accounting exception, we lack jurisdiction to consider whether the court erred in ordering a new trial on damages.

## VI

For the reasons stated herein, we affirm-in-part, reverse-in-part, and vacate-in-part the district court’s judgments and remand the case to the district court to proceed in accordance with the holdings discussed herein.

**AFFIRMED-IN-PART, REVERSED-IN-PART,  
VACATED-IN-PART, AND REMANDED**

No costs.

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*Gillespie*, which involved a claim under Ohio’s wrongful death statute and general maritime law.

**United States Court of Appeals  
for the Federal Circuit**

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**ALFRED E. MANN FOUNDATION FOR  
SCIENTIFIC RESEARCH,  
ADVANCED BIONICS, LLC,**  
*Plaintiffs-Cross-Appellants*

v.

**COCHLEAR CORPORATION, NKA COCHLEAR  
AMERICAS, COCHLEAR LTD.,**  
*Defendants-Appellants*

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2015-1580, 2015-1606, 2015-1607

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Appeals from the United States District Court for the  
Central District of California in No. 2:07-cv-08108-FMO-  
SH, Judge Fernando M. Olguin.

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NEWMAN, *Circuit Judge*, concurring in part, dissenting in  
part.

I agree that claim 10 of the '616 patent is valid and in-  
fringed, and I agree that claim 1 of the '616 patent is  
valid. Thus I join Parts II and III-B of the court's opinion.  
I also agree that, in view of changed law, remand is  
appropriate on the issue of willful infringement, and to  
that extent I join Part IV of the court's opinion.

However, I do not share the court's view that claims 6  
and 7 of the '691 patent are invalid for indefiniteness.



The district court's finding of indefiniteness was contrary to the testimony of the experts for both sides. I respectfully dissent from the court's decision in Part III-A.

As for the district court's vacatur of the jury's damages verdict and order for a retrial of damages, I do not agree that the order is immune from the appellate review requested by the district court under Rule 54(b). Thus I respectfully dissent from part V of the court's decision.

## I

### *Indefiniteness of Claims 6 and 7*

The court affirms the invalidation of claims 6 and 7 on the ground that the Foundation does not persuasively show that the microprocessor performs a logarithmic conversion function. Maj. Op. at 14. This position is contrary to the evidence presented by both sides; Cochlear failed to carry its burden to present clear and convincing evidence of invalidity on the ground of indefiniteness.

The court also finds the claims indefinite because the '691 patent does not state which of several known methods was used for the logarithmic conversion. The specification expressly discloses the non-linear mapping steps, and the experts for both sides agreed that persons in the field of the invention know how to perform the simple conversion, which was well-known in the prior art.

The claims at issue, claims 6 and 7 of the '691 patent, are challenged only for the clause here shown in bold:

6. A cochlea stimulation system, comprising:

audio signal receiving means;

an externally wearable signal processor (WP) for receiving and processing the audio signals received by the audio signal receiving means and including **means for generating data indicative of the audio signal**;

means for transmitting the data to an implanted cochlear stimulator (ICS), the ICS including:

means for transmission from the WP,

processor means for processing such transmissions to generate stimulation pulses and for controlling the pulse width of the stimulation pulses,

a plurality of electrically isolated capacitor-coupled cochlea stimulating electrodes for receiving the stimulation pulses,

means in the ICS responsive to data from the WP for selectively monitoring at least one of the electrodes or voltages in the ICS and for generating ICS-status-indicating signals, and

means in the ICS for transmitting such ICS-status-indicating signals to the WP; and

means in the WP for receiving and processing the ICS-status-indicating signals.

'691 Patent, cl. 6. The structure described in the specification for the “means for generating data indicative of the audio signal” is a microprocessor performing a logarithmic conversion function.

The '691 patent describes all of the claim elements in the form that is customary in computer-facilitated inventions: stating the function and how it is performed, in text, drawings, and flow-charts. The patent explains that the cochlear electrodes mimic sound by outputting stimulation signals in the cochlear electrodes with voltages between 0 and 2500 microamps. '691 Patent, col. 6 ll. 8–48. The specification includes a detailed logarithmic schedule of steps corresponding to the range of sounds. '691 Patent, col. 4 ll.43–64. Sound waves are translated into digital information in the D/A converter and then into the selected output voltage in the microprocessor by a

logarithmic conversion. '691 Patent, col. 10, ll. 1–8. The patent teaches that the means for generating “data indicative of the audio signal” is a microprocessor performing a basic logarithmic conversion, for which the specification includes a look-up table. '691 Patent, col. 6 ll. 8–48.

Precedent requires that the court views the technology as it would be viewed by persons of skill in the field of the invention. See *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1340 (Fed. Cir. 2008) (“[T]he specification must permit one of ordinary skill in the art to ‘know and understand what structure corresponds to the means limitation.’”). The overarching requirement is that the particular factual situation must be viewed, and definiteness evaluated, in the same way as by persons in the field of the invention.

With respect to software-implemented systems, this court has explained that:

Claim definiteness . . . depends on the skill level of a person of ordinary skill in the art. In software cases, therefore, algorithms in the specification need only disclose adequate defining structure to render the bounds of the claim understandable to one of ordinary skill in the art.

*AllVoice Computing PLC v. Nuance Commc’ns, Inc.*, 504 F.3d 1236, 1245 (Fed. Cir. 2007) (citations omitted). In *Typhoon Touch Technology, Inc. v. Dell, Inc.*, 659 F.3d 1376, 1386 (Fed. Cir. 2011), the court observed that “known computer-implement[ed] operations . . . are readily implemented by persons of skill in computer programming.”

Logarithmic conversion has been known for centuries. The experts for both sides agreed that logarithmic conversion is well-known, and that persons of skill in the field of the invention would understand the description of the logarithmic conversion in the claimed system. *Alfred E.*

*Mann Found. for Sci. Res. v. Cochlear Corp.*, No. 07-8108 FMO (SHx) (Testimony of The Foundation Expert Dr. Young) (Dkt. 454) (“Your output relationship is well defined. I can’t change the log value. It’s a fixed function.”); Trial Tr. at 75, ll. 1–11, *Alfred E. Mann Found. for Sci. Res. v. Cochlear Corp.*, No. 07-8108 (C.D. Cal. Jan. 22, 2014) (Dkt. 456) (Testimony of Cochlear Expert Dr. Stevenson) (testifying that a logarithmic conversion is used because “at the other end you want this exponential”); The Foundation Expert Dr. Young Decl. at ¶ 17, *Mann Found.*, No. 07-8108 (Dkt. 406) (“That [logarithmic] algorithm is implemented with a simple logarithmic lookup table.”). The ’691 patent includes a lookup table containing the results of the calculations. ’691 Patent, col. 4 ll.43–64.

No witness for either side testified that a person of skill in the field would have difficulty performing the logarithmic conversion. No testimony on examination or cross-examination placed this aspect in dispute. It was not disputed that the conversion of sound into “data indicative of the audio signal” is conventional and was known and used in the operation of prior art cochlear implants. No contrary evidence was presented, and no contrary argument is offered. Nonetheless, my colleagues find the claims indefinite on the ground that there are “multiple logarithmic algorithms[] none of which the specification describes.” Maj. Op. at 14. Precedent does not require that well-known formulas must be stated in the specification, when they are known in the relevant art.

A known procedure is not rendered indefinite when there is more than one known way of carrying it out. As stated in *Ibormeith IP, LLC v. Mercedes-Benz USA, LLC*, 732 F.3d 1376, 1379 (Fed. Cir. 2013): “For a claim to be definite, a recited algorithm, or other type of structure for a section 112(f) claim limitation, need not be so particularized as to eliminate the need for any implementation

choices by a skilled artisan.” Here, there was no dispute that persons “skilled in the particular art” would “understand what structure(s) the specification discloses.” *Amtel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1382 (Fed. Cir. 1999).

Both parties’ experts and the district court agreed that the invention necessarily employs a logarithmic conversion. *See Mann Found.*, 96 F. Supp. at 1051 (“While it may be necessary for the wearable processor (WP) . . . to perform a logarithmic conversion, because the implantable cochlear system includes an exponential D/A converter, it has not been established that the logarithmic conversion must take place in the microprocessor.”). It was not disputed that logarithmic conversion was known for audio data, and had been used in prior art cochlear implants.

My colleagues’ holding that it was necessary to state which of the two or three known logarithmic conversion routines was used, on pain of invalidity, is unsupported by mathematics, reason, or precedent. *See S3 Inc. v. NVIDIA Corp.*, 259 F.3d 1364, 1371 (Fed. Cir. 2001) (“[P]atent documents need not include subject matter that is known in the field of the invention and is in the prior art, for patents are written for persons experienced in the field of the invention.”); *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1366–67 (Fed. Cir. 2003) (implementation choices of “known algorithms” are “properly left to the knowledge of those skilled in the art, and need not be specified in the patent”).

On similar facts, this court has held that claims are not invalid for indefiniteness when expert testimony “sets forth several straightforward ways that the algorithm . . . could be implemented by one skilled in the art.” *AllVoice*, 504 F.3d at 1245. On cross examination at trial, the Foundation’s expert, Dr. Young, explained that no matter how a logarithmic conversion is implemented, the algo-

rithm will be the same: “your output relationship is well defined. I can’t change the log value. It’s a fixed function.” *Alfred E. Mann Found. for Sci. Res. v. Cochlear Corp.*, No. 07-8108 FMO (SHx) (Testimony of The Foundation Expert Dr. Young) (Dkt. 454).

A finding of invalidity based on indefiniteness requires proof by clear and convincing evidence that persons skilled in the field of the invention would not be “able to perform the recited function” based on the description in the specification and the knowledge in the art. *Intel Corp.*, 319 F.3d at 1366. This standard controls, along with the truism that “[p]atent documents are written for persons familiar with the relevant field . . . lest every patent be required to be written as a comprehensive tutorial and treatise for the generalist.” *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1119 (Fed. Cir. 2002).

The court errs in finding claims 6 and 7 invalid for indefiniteness, upon new and ill-defined requirements for patent specifications that are unrealistic and unnecessary, adding burdens and pitfalls with no benefit to anyone. The implementing structure “must be sufficiently defined to render the bounds of the claim—declared by section 112(f) to cover the particular structure and its equivalents—understandable by the implementer.” *Ibormeith*, 732 F.3d at 1379. As computer-implemented technology continues to provide new public benefits, consistency of judicial view is essential to stability of the law and progress of the technology.

## II

### *Jurisdiction to review the Order for a new trial*

The district court vacated the jury’s damages verdict, Judgment at 2, *Mann Found.*, No. 07-8108 (Dkt. 548), and ordered a new trial on damages on the ground that “the damages awarded by the jury were not broken down as to each claim or patent,” Order Re: Post-Trial Motions at 23,

*Mann Found.*, No. 07-8108 (Dkt. 540). My colleagues hold that this court lacks jurisdiction to review the district court’s order of vacatur and a new trial, holding that the district court abused its discretion in certifying and entering judgment under Rule 54(b), on the theory that there is not a final decision on damages. Maj. Op. at 20-21. The vacatur order is reviewable under either the district court’s Rule 54(b) certification or under 28 U.S.C. § 1292(c)(2). The district court entered “[j]udgment . . . in favor of Defendants as to the vacatur of the jury’s damages award,” Judgment at 2. Thus the district court assured that its judgment of vacatur was appealable. *Mann Found.*, No. 07-8108 (Dkt. 547). Precedent and sound practice counsel that we attend to this appeal requested by the district court.

The Supreme Court does not view the requirement of finality as strictly “jurisdictional,” but as a matter of practical jurisprudence and comity. The Court has counseled that “the requirement of finality is to be given a practical rather than a technical construction.” *Gillespie v. United States Steel Corp.*, 379 U.S. 148, 152 (1964) (internal quotations omitted); see *American Export Lines, Inc. v. Alvez*, 446 U.S. 274, 279 (1980) (“[N]ow that the case is before us . . . the eventual costs, as all the parties recognize, will certainly be less if we now pass on the questions presented here rather than send the case back with those issues undecided.”) (alterations original) (citing *Gillespie*, 379 U.S. at 153)). In *White v. New Hampshire Department of Employment Security*, the Court observed that “district courts have ample authority to deal with” the “problem” of piecemeal appeals. Here, the district court prudently exercised such authority, entering judgment as to the vacatur of the jury’s damages verdict and certifying the issue under Rule 54(b).

The district court vacated the damages verdict that was fully tried on the jury instruction submitted by Cochlear, the party now complaining of the result. The verdict

form, proposed and accepted by Cochlear, instructed the jury:

25. If you find that the Cochlear Defendants have infringed a valid claim of either the '616 patent or the '691 patent, what is the reasonable royalty rate that the Cochlear Defendants should pay to the Foundation?

The jury answered: 7.5%. Verdict Form, *Mann Found.*, No. 07-8108 (Dkt. 460). The Foundation argues that the instructions were correct and Cochlear's post-trial objection waived, and also that the verdict is well supported by the evidence.

Precedent and sound practice provide appellate jurisdiction of the vacatur order. The Ninth Circuit, whose precedent controls as to procedural matters in its district courts, has recognized that appellate review must promote judicial efficiency and sensible litigation economy. *See Wabol v. Villacrusis*, 958 F.2d 1450, 1455 (9th Cir. 1990) ("Though the remaining issues could eventually ascend to this court, this alone should not prevent our adjudication of important and potentially dispositive questions which have been fully briefed and argued. Such a result would disserve the cause of judicial economy and therefore frustrate the very purpose of the final judgment rule."). This is particularly true when, as here, the district court invokes appellate review. *Id.* at n.7 ("Significantly, our exercise of jurisdiction will not interfere with the course of the trial. The trial court purported to issue a final judgment.").

If the proposed new trial were to proceed, it would be on the basis of separating the damages assessment by patent and claim, as the district court apparently was persuaded after the verdict was rendered. However, Cochlear presented the verdict form that the district court accepted and used. The Ninth Circuit counsels reluctance to "allow litigants to play procedural brinkmanship with



the jury system and take advantage of uncertainties they could well have avoided.” *McCord v. Maguire*, 873 F.2d 1271, 1274 (9th Cir. 1989) (holding that litigants have the responsibility to request or submit special verdict forms); *see also Mitsubishi Elec. Corp. v. Ampex Corp.*, 190 F.3d 1300, 1304 (Fed. Cir. 1999) (party forfeited post-trial challenge on the ground that a special verdict should have been obtained, by proposing and accepting a verdict form that did not separate the potential grounds of invalidity).

Nor was the verdict form that was adopted incorrect in law. It was not disputed that the royalty base was the same as to any of the four claims, such that infringement of any claim would produce the same damages calculation. On this premise, the evidence presented by both parties did not differentiate among the four claims and two patents. *See TiVo, Inc. v. EchoStar Commc’ns Corp.*, 516 F.3d 1290, 1312 (Fed. Cir. 2008) (“Because the damages calculation at trial was not predicated on the infringement of particular claims, and because we have upheld the jury’s verdict that all of the accused devices infringe the software claims, we affirm the damages award.”); *SK Hynix Inc. v. Rambus Inc.*, 2013 WL 1915865, at \*15 (N.D. Cal. May 8, 2013) (denying new trial where “damages were awarded based upon infringement by particular products, not upon infringement of particular patent claims”).

Cochlear concedes that “[t]he evidence . . . did not give the jury any way to assess a royalty rate assuming infringement of fewer claims or patents.” Cross-Appellee Resp. Br. at 28. The concession that the evidence of record provided no way to differentiate among infringement by claim or patent, distinguishes this case from the facts of *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1262 (Fed. Cir. 2014), where this court remanded to determine whether the invalidation of one patent might affect the damages calculation. The evidence, instructions, and damages theories presented led the jury to a

single, permissible conclusion: that a reasonable royalty for the invention—back telemetry—was required to compensate the Foundation for infringement of even a single claim.

Precedent and sound practice establish the appellate obligation to review this grant of a new trial. Such review is not barred. From the court's contrary holding, I respectfully dissent.