IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

HONEYWELL INTERNATIONAL INC. and HONEYWELL INTELLECTUAL PROPERTIES INC., Plaintiffs.	)	
v.	)	C. A. No. 03-242-MPT
UNIVERSAL AVIONICS SYSTEMS CORP. and SANDEL AVIONICS, INC., Defendants.	)	

MEMORANDUM OPINION

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Wilmington, Delaware
April 7, 2006

Thynge, U.S. Magistrate Judge

I. INTRODUCTION

This is a patent infringement case. On March 3, 2003, Honeywell International Inc. and Honeywell Intellectual Properties Inc. (collectively "Honeywell")[1] filed suit alleging infringement of its U.S. Patent No. 4,914,436 ("the '436 patent") by certain products of Universal Avionics Systems Corp. ("Universal")[2] and Sandel Avionics Inc. ("Sandel").[3] A jury trial was held December 1 through December 8, 2004.[4] On December 8, 2004, the jury returned a verdict of infringement of claim 1 of the '436 patent against Universal.[5] Consistent with Rule 50 of the Federal Rules of Civil Procedure ("Rule 50"), Universal made a motion for judgment as a matter of law ("JMOL"). This opinion constitutes the court's determination of Universal's Renewed Motion for Judgment as a Matter of Law.[6] For the reasons explained below, the court denies that motion.

II. GOVERNING LAW

Rule 50(a)(1) states, in relevant part, that:[7]

> If during a trial by jury a party has been fully heard on an issue and there is no legally sufficient evidentiary basis for a reasonable jury to find for that party on that issue, the court may determine the issue against that

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[1] Honeywell International Inc. is a Delaware corporation with its principal place of business in New Jersey. Honeywell Intellectual Properties Inc. is an Arizona corporation with its principal place of business in Arizona.

[2] Universal is an Arizona corporation with a place of business in Delaware.

[3] Sandel is a Delaware corporation with a place of business in California.

[4] Prior procedural history in this case, as well as more detailed description of the technology described in the '436 patent and that of the accused products are set forth in *Honeywell Int'l Inc. v. Universal Avionics Sys. Corp.*, 347 F. Supp. 2d 81 (D. Del. 2004), familiarity with which is assumed by the reader.

[5] Honeywell's complaint alleged infringement of claims 1, 2, 4 and 5 of the '436 patent. At trial, only infringement of claim 1 was presented to the jury. The jury returned a verdict of non-infringement with respect to Sandel's accused product.

[6] D.I. 193.

[7] Fed. R. Civ. P. 50(a)(1).

party with respect to a claim or defense that cannot under the controlling law be maintained or defeated without a favorable finding on that issue.

Rule 50(b) states:[8]

> If, for any reason, the court does not grant a motion for judgment as a matter of law made at the close of all the evidence, the court is considered to have submitted the action to the jury subject to the court's later deciding the legal questions raised by the motion. The movant may renew its request for judgment as a matter of law by filing a motion no later than 10 days after entry of judgment- and may alternatively request a new trial or join a motion for a new trial under Rule 59. In ruling on a renewed motion, the court may:
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> (1) if a verdict was returned:
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> (A) allow the judgment to stand,
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> (B) order a new trial, or
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> © direct entry of judgment as a matter of law; or
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> (2) if no verdict was returned
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> (A) order a new trial, or
>
> (B) direct entry of judgment as a matter of law.

When evaluating a motion for judgment as a matter of law, the court reviews the jury's decision to determine if it is reasonably supported by the evidence.[9] Furthermore, to determine the sufficiency of the JMOL motion, a court must consider all of the evidence in a light most favorable to the non-movant,[10] and must draw all inferences in favor of the non-movant:

> In assessing the sufficiency of the evidence, the court must give the non-moving party, as the verdict winner, the benefit of all logical inferences that could be drawn from the evidence presented, resolve all conflicts in the evidence in his favor, and in general, view the record in the light most favorable to him.[11]

The court may not determine the credibility of witnesses nor may the court substitute its

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[8] Fed. R. Civ. P. 50(b).

[9] *Arthrocare Corp. v. Smith & Nephew Inc.*, 310 F. Supp. 2d 638, 652 (D. Del. 2004).

[10] *Dana Corp. V. IPC Limited Partnership*, 860 F.2d 415, 417 (Fed. Cir. 1988).

[11] *Arthrocare Corp.*, 310 F. Supp. 2d at 652 (citing *Williamson v. Consol. Rail Corp.*, 926 F.2d 1344, 1348 (3d Cir. 1991); *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893 (Fed. Cir. 1984)).

account of the facts for that of the jury's account of the facts.[12]

To prevail on a JMOL motion, the moving party must show that the jury's findings are not supported by substantial evidence or, if the findings are supported by substantial evidence, the moving party must show the legal conclusions implied by the jury's verdict cannot be supported by those findings in the law.[13] "Substantial evidence is such relevant evidence from the record taken as a whole as might be acceptable by a reasonable mind as adequate to support the finding under review,"[14] or defined another way, substantial evidence is evidence that a reasonable individual might accept as supporting the jury's decision.[15]

The trial court is also required to review the issues of law necessary to the verdict. While the jury's factual findings are to receive deference on a motion for JMOL, "the legal standards that the jury applies, expressly or implicitly, in reaching its verdict are considered by the district court and the appellate court *de novo* to determine whether those standards are correct as a matter of law."[16] The court must insure that the correct legal standard or law is applied.[17]

A jury award of damages is reviewed by this Court for substantial evidence.[18] That award is entitled to deference.[19] The Federal Circuit has stated that the jury's findings must be upheld unless "the amount is grossly excessive or monstrous, clearly

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[12] *Id.*
[13] *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1348 (Fed. Cir. 1998).
[14] *Perkin-Elmer Corp.*, 732 F.2d at 893.
[15] *C.R. Bard Inc. v. U.S. Surgical Corp.*, 258 F. Supp. 2d 355, 358 (D. Del. 2003).
[16] *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 975 (Fed. Cir. 1995) (citing *Baltimore & Carolina Line, Inc. v. Redman.*, 295 U.S. 654, 660 (1935)).
[17] *Markman*, 52 F.3d at 975.
[18] *Id.*
[19] *Monsanto Co. v. Ralph*, 382 F. 3d 1374, 1383 (Fed. Cir. 2004).

not supported by the evidence, or based only on speculation or guesswork."[20]

III. POSITIONS OF THE PARTIES

A. Infringement

Universal asserts several reasons why the jury's verdict of infringement is not supported by the substantial evidence presented at trial:

1. The MGCB (Minimum Ground Clearance Boundary) function of SCN 11.0 did not use the 'enabling envelope' required by claim 1 of the '436 patent (Trial Tr. 1634:24-1653:6).[21]

2. The MGCB of SCN 11.0 did not require an enabling envelope because it was always on immediately after take-off (Trial Tr. 1570:22-1572:11, 1582:6-9, 1637:2-15, 1638:18-21, 1650:19-1651:5).

3. It should be noted very carefully that lead counsel for Honeywell explicitly agreed with this fact. He said "[t]he MGCB system as you've heard again and again, and as you heard from Dr. Powell yesterday, is a system that is always on. We agree." (Trial Tr. 2035:2-5; *see also* Trial Tr. 229:10-13).

4. The unencumbered testimony of Patrick Krohn and David Powell provided additional corroboration for this fact (Trial Tr. 1571:17-1572:11, 1582:6-9, 1650:19-1651:5).

5. The source code which drove the MGCB of SCN 11.0 had no "RETURNS" or exits which allowed TAWS to disable this self-executing algorithm (1650:12-1651:5).

6. John Hansman did not identify an enabling envelope during his direct testimony (712:20-713-14).

7. Honeywell's remaining witnesses, Messrs. Bateman, Daly and Grove, similarly failed to point out an enabling envelope for the MGCB embedded in TAWS. In fact, Honeywell's participatory witnesses said nothing substantive about SCN 11.0 because they knew nothing about the system

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[20] *Brooktree Corp. v. Advanced Micro Devices Inc.*, 977 F.2d 1555, 1580 (Fed. Cir. 1992).

[21] The trial in this matter was directed to the alleged infringement of Universal's Terrain Awareness Warning System ("TAWS"), specifically, to Software Control Number ("SCN") 11.0 as reflected in JTX42 (Universal's source code) and JTX46 (Universal's Software Requirements Document ("SRD")).

and made no effort to cure this glaring deficiency (Trial Tr. 442:11-444:19, 533:1-4, 533:18-534:16, 539:4-18, 542:16-544:16, 652:17-653:1).

8. Honeywell compounded matters and created the suspicious 'empty chair' by refusing to call Patrick Glaze, a current Honeywell employee who previously designed TAWS, along with Mr. Krohn, at Universal. Without a charge to this effect, a lay jury could easily miss the significance of this maneuver.

9. Universal's primary proofs, the Software Requirements Document (JTX 46) and Source Code (JTX 42), do not use the words 'enabling envelope' either literally or by implication.

10. The left boundary of Figure 4-26 is not an enabling envelope in a one or three dimensional configuration.

11. Limitation 3 of claim 1 calls for dual structures–an enabling envelope and a separate warning system which is activated or turned on by the enabling envelope.

12. With respect to Figure 4-26 of the Software Requirements Document, there can be no double inclusion because a single commercial element cannot satisfy two (2) separate limitations in asserted claim 1. *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1561-1562 (Fed. Cir. 1991).[22]

Honeywell argues Universal's twelve points essentially reduce to three overarching arguments which were made at trial and were rejected by the jury: (1) that Universal's documentation does not show an "enabling envelope"; (2) that the MGCB is a "warning system," not an "enabling envelope"; and (3) that its MGCB is not "enabled" based on distance from the airport because it is "always on."

Honeywell asserts Universal's SRD and Universal's TAWS source code, along with testimony concerning those documents, is substantial evidence supporting the jury's verdict of infringement. According to Honeywell, that evidence demonstrates that

[22] D.I. 192 at 1-2 (Universal's Memorandum In Support Of Its Renewed Motion For Judgement As A Matter of Law).

the MGCB functionality of Universal's TAWS includes both an enabling envelope as well as a warning system as required by claim 1 of the '436 patent. In support of this contention, Honeywell points to the undisputed fact that the MGCB functionality of Universal's TAWS product will not, and cannot, issue an alert beyond fifteen nautical miles of an airport reference point, or runway threshold (the "destination airport"). Inside a fifteen mile radius of the destination airport, there is both an area in which an aircraft may operate where no alert will issue and an area where an alert will be issued. Based on that fact, Honeywell argues that even though Universal's TAWS product is "always on," or is continually calculating an aircraft's distance from the destination airport, nevertheless the warning system is not enabled. Honeywell reiterates that it is not until an aircraft crosses into an area fifteen miles from the destination airport that the warning system is "turned on," or activated and capable of issuing an alert.

B. Damages

Universal also contends that the testimony of Honeywell's damages expert, Julie Davis, did not provide substantial evidence sufficient to support the jury's damages award. According to Universal the effective royalty rate which Davis opined as reasonable in this case was excessive and, with one exception, not based on any license containing an actual, agree-upon royalty. Davis' damage opinions also purportedly excluded two important licences granted by Honeywell, or a predecessor corporation, and ignored the fact that the '436 technology was provided at no charge as part of a free software upgrade to certain Honeywell customers. Finally, Universal maintains that Davis' reasonable royalty opinion is undermined because the per unit royalty rate she determined for the single '436 patent is the same dollar amount she

opined was reasonable in a prior case[23] in which Honeywell asserted Universal infringed five of its patents.[24]

In contrast, Universal suggests that its damages expert, Dr. Richard Gering, based his testimony on "several executed license and settlement agreements in the relevant field to support his conclusion" that a reasonable royalty was substantially less than that proposed by Davis.

Honeywell responds that Davis considered each of the fifteen *Georgia-Pacific*[25] factors in estimating what royalty rate would have resulted from a hypothetical negotiation between Honeywell and Universal. Honeywell asserts that nothing Universal argues with respect to the jury's damages award is so "grossly excessive" or "outrageously high" so as to warrant a grant of their motion.

Honeywell notes that Davis' calculation of Universal's profit margin was acknowledged to be correct by Universal's damages expert, Gering. Honeywell contends that Davis' testimony concerning her "proposed royalty was well within the licensing industry's 'Rule of Thumb' that a royalty should be 'equal to one-quarter to one-third of the profits attributable to the invention.'"[26] Honeywell notes that this testimony was not challenged on cross examination. Davis testified as to why she considered the two licenses cited by Universal were not relevant to her analysis and why her suggested royalty amounts would be the same for infringement of the single

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[23] Civil Action No. 02-359-MPT.

[24] Those five patents were directed at enhanced ground proximity warning systems ("EGPWS"), aviation technology referred to by the parties as the "look-ahead" patents.

[25] *Dow Chem. Co. v. Mee Indus., Inc.* 341 F.3d 1370, 1382 (Fed. Cir. 2003) (referencing *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (D.C.N.Y. 1970)).

[26] D.I. 199 at 13.

'436 patent as it had been in the case of the five look-ahead patents. Finally, Honeywell states that the fact that certain of its customers were not charged for software upgrades containing the '436 patent technology does not support Universal's position that the technology had little value. The '436 technology was only given "to customers who had already bought and paid for the EGPWS system–a policy that Honeywell adopted for all EGPWS software upgrades, not just those relating to the '436 technology."[27]

IV. ANALYSIS

A. Infringement

Trial in this action was limited to claim 1 of the '436 patent. That claim includes a preamble and five limitations which make up the body of the claim and recites:

Claim 1

> [Pre.] A system for use in an aircraft for providing an enabling envelope for a ground proximity warning system for an aircraft comprising:
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> [1.] a first source of signals representative of the longitude and latitude of an airport;
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> [2.] a second source of signals representative of the current longitude and latitude of said aircraft;
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> [3.] means responsive to said first source of signals representative of the longitude and latitude of said airport and said second source of signals representative of the current longitude and latitude of said aircraft for computing the distance of said aircraft from said airport and providing an enabling envelope for enabling the warning system as a function of said distance of the aircraft with respect to said airport;
>
> [4.] a source of signals representative of the relative angular position of a particular runway with respect to the heading of the aircraft; and

[27] D.I. 199 at 16.

> [5.] means responsive to said first and second sources of signals for providing a signal representative of the alignment of the aircraft with the runway by determining the angle between the runway and the heading of the aircraft.[28]

The emphasis of Universal's JMOL motion with regard to infringement is the third limitation, particularly, the portion reciting: "providing an enabling envelope for enabling the warning system as a function of said distance of the aircraft with respect to said airport." Pertinent to this limitation, the court construed the terms: "enabling" to mean "activating or turning on"; "enabling envelope" to mean "activating or turning on a set of limitations within which an aircraft can perform safely and effectively"; and "warning system" to mean "a system to monitor the flight conditions of an aircraft and provide a warning if flight conditions are such that an inadvertent contact with the ground is imminent."[29]

Based on the court's construction of those terms, Universal argues that the third limitation of claim 1 requires an enabling envelope which activates or turns on a separate warning system and that insufficient evidence was presented at trial supporting the jury's verdict of infringement. Universal's position is that the MGCB functionality of it's TAWS product does not enable, or activate, a separate warning system. Rather, the MGCB is a warning system in and of itself that is always on. Because the MGCB warning system is "always on" following an aircraft's takeoff, and because there are no "RETURNS" in the source code turning off that system, Universal asserts that its TAWS product does not need, or contain, a separate enabling envelope

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[28] '436 patent, cl. 1.

[29] *Honeywell Int'l Inc. v. Universal Avionics Sys. Corp.*, 347 F. Supp. 2d 8, 106 (D. Del. 2004).

which "enables," or turns on, the MGCB warning system as required by the court's claim construction.

Each of these arguments (and evidence in support thereof) was presented to, and rejected by, the jury which determined that Universal's TAWS literally infringes claim 1 of the '436 patent. As discussed below, there was substantial evidence presented at trial from which a reasonable jury could have reached its verdict.

First, the fact that the source code for the MGCB functionality of Universal's TAWS system is continually calculating an aircraft's distance from a destination airport was made abundantly clear to the jury. Krohn (Universal's lead engineering manager for TAWS in the 1997 time frame) and Powell (Universal's expert witness on the issue of infringement) each testified that the MGCB routine in Universal's TAWS begins to run from the time an aircraft takes off and automatically, updates or refreshes, once every second.[30] Each testified that this means that, after takeoff, the MGCB warning system is always on, or enabled.[31] Universal contends this fact establishes there is no enabling envelope which activates or turns on the MGCB warning system.

That the MGCB algorithm is "always on," or continually running, was explicitly acknowledged by Honeywell's lead counsel during closing argument: "[t]he MGCB system as you've heard again and again, and as you heard from Dr. Powell yesterday, is a system that is always on. We agree."[32] Honeywell's expert, Dr. John Hansman, did

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[30] Trial Tr. 1571:3-9, 1637:2-15.

[31] Trial Tr. 1571:17-19 (Krohn testifying that the MGCB warning envelope is enabled "[a]fter take off"); Trial Tr. 1651:3-5 (Powell testifying that the source code demonstrates that the MGCB code is "always on" after take off).

[32] Trial Tr. 2035:2-5; *see also* Trial Tr. 229:10-13 ("[W]hen you hear . . . testimony that says that the MGCB is really always on, please understand that we don't disagree with that.")

not dispute that the algorithm was continually running,[33] but testified that the MGCB warning system is not "enabled," or capable of issuing an alert, until the aircraft comes within fifteen miles of the destination airport.[34] Likewise, Powell, testifying for Universal, agreed that "there won't be an alert from MGCB beyond 15 miles"[35] regardless of an aircraft's altitude because the MGCB is "designed for the vicinity within 15 miles" of the destination airport.[36]

It is also undisputed that the source code has no "RETURNS," or exits, which disable the self-executing algorithm for the MGCB functionality of Universal's TAWS. With respect to the source code implementing the MGCB warning system, Powell testified that "the only way you can exit this code is to have a statement called a return . . . . [T]here's no return here. That means there is no way out of this code. . .. so there's no disabling possible either before or after this part of the code."[37] Based on testimony concerning the lack of returns, Universal asserts that without this option to exit the code, it is not possible to disable the MGCB.[38]

Testimony from both Universal and Honeywell witnesses confirmed, however, that the MGCB functionality of Universal's TAWS will not, and cannot, issue an alert if an aircraft is more than fifteen nautical miles from a destination airport.[39] A reasonable

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[33] Trial Tr. 831:16-17 (agreeing that "[t]he overall program is running all the time").

[34] Trial Tr. 700:12-14 (stating that "the system is actually enabled when you get within fifteen nautical miles"); Trial Tr. 713:12-14 ("[T]his warning envelope for the MGCB is turned on once you get within 15 nautical miles.").

[35] Trial Tr. 1708:5-6.

[36] Trial Tr. 1709:16-23.

[37] Trial Tr. 1650:13-1651:1. On cross examination Universal did not question Hansman regarding the absence of returns in the MGCB functionality of the source code but there is no dispute on this fact.

[38] Trial Tr. 1650:19-1651:5.

[39] Testifying for Universal, Powell acknowledged that "[y]ou and I both know that there won't be an alert from MGCB beyond 15 miles," Trial Tr. at 1708:5-6, regardless of how low the aircraft is flying because "[i]t's not designed to [issue an alert more than 15 miles from the destination airport], it's

jury could conclude that until that fifteen mile threshold is crossed Universal's TAWS is not enabled, or activated and no alert will issue.

Universal also argues that evidence was not presented showing that its TAWS contains both an enabling envelope and a separate warning system. Universal contends that its TAWS system contains a warning, or alert, envelope (the MGCB envelope) but not an separate enabling envelope and, therefore, cannot literally infringe the '436 patent. Universal notes the description of the MGCB functionality of its TAWS product in its SRD[40] which identifies the MGCB as a warning envelope, not as an enabling envelope.[41] Section 4.2.6 is titled "Generate MGCB Alerts" and describes the requirements for MGCB alerting,[42] indicating that "TAWS alerts whenever the airplane descends below certain thresholds by annunciating 'TOO LOW TERRAIN'".[43] Universal stresses that the SRD makes no explicit reference to "enabling," "activating," or "turning on" a separate warning system.[44]

Trial testimony purportedly supports Universal's contention that there is no separate enabling envelope. Krohn testified that Section 4.2.6 does not relate in any way to when the MGCB is enabled or activated.[45] Universal maintains that section of the SRD describes only the circumstances when an MGCB alert will issue, as well as

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designed for the vicinity within 15 miles." Trial Tr. at 1709:16-17. Similarly, Hansman testified that "the system is actually enabled when you get within fifteen nautical miles." Trial Tr. 700:12-14. "[O]utside of 15 nautical miles, there is no . . . alert minimum ground clearance boundary alert independent of your position. Inside 15 nautical miles, you will get the alert if you get below the warning threshold or warning envelope." Trial Tr. 715:19-716:1.

[40] JTX 46.

[41] *Id.* at UAII 0196873-0196875.

[42] *Id.* at UAII 0196873-0196875; Trial Tr. 1574:17-20.

[43] D.I. 192 at 6 (quoting JTX 46 at UAII 196873 (emphasis added by Universal)).

[44] Trial Tr. 1575:24-1576:13 (Krohn testimony).

[45] Trial Tr. 1574:21-24.

the placement of the MGCB alert envelope with respect to the destination runway. Krohn further testified that the structured English in Section 4.2.6[46] of the SRD defines the requirements to implement the software–not when the MGCB envelope is activated or enabled.[47]

Universal also points to the deposition testimony of Patrick Glaze, a former Universal engineer who contributed to the TAWS design.[48] At his July 29, 2004 video deposition, portions of which were shown at trial, Glaze agreed with the statement that the structured English of Section 4.2.6 "doesn't describe when the minimum ground clearance boundary system is turned on or – it describes when an actual alert will issue; correct?" by responding "I think that's correct."[49]

Universal also contends that Honeywell relied primarily on Figure 4-26[50] in attempting to satisfy the enabling envelope limitation. Universal argues, however, that

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[46] JTX 46 at UAII 0196874.

[47] Trial Tr. 1575:24-1576:13.

[48] Trial Tr. 1812:22-1814:2.

[49] Trial Tr. 1817:9-14. Universal contends that "Honeywell compounded matters created by the suspicious 'empty chair' by refusing to call Patrick Glaze, a current Honeywell employee who previously designed TAWS, along with Mr. Krohn, at Universal. Without a charge to this effect, a lay jury could easily miss the significance of this maneuver." D.I. 192 at 2. Universal also asserts that the reason for Honeywell's election not to call Glaze as a live witness "was apparent from the record." D.I. 192 at 7. Apart from the acknowledged "suspicious[ness]" of Glaze not testifying at trial, it is difficult to believe that a "lay jury," which is expected to understand complex technical evidence presented at trial, would miss the significance, if any, of Glaze's absence. The jury heard testimony regarding Glaze's work at Universal and his involvement in development of Universal's TAWS, *see, e.g.*, Trial Tr. 1541:5-25; 1545:10-1546:4; 1549:1-7; 1558:8-12; 1646:3-9; 1843:17-19, and that Glaze left Universal and went to work for Honeywell following Honeywell's filing of this lawsuit. Trial Tr. 1542:2-7; *see also* Trial Tr. 1656:1-14. Prior to introducing deposition testimony of Glaze, counsel for Universal stated to the jury that "Mr. Glaze, as near as I can tell, is not going to appear on behalf of Honeywell to present live testimony. And so we are going to show you now a six or seven-minute clip of his deposition that was conducted some time prior to today's trial." Trial Tr. 1788-5-10. Again, immediately before playing a portion of that deposition, Universal's counsel reminded the jury that "Mr. Glaze, as you're all probably familiar at this point was formerly employed by Universal Avionics, and is now employed by Honeywell." Trial Tr. 1812:4-7. The court concludes, therefore, that no jury charge regarding Glaze's absence as a live witness was necessary.

[50] JTX 46 at UAII 0196875.

Honeywell's position was contradicted by the documentary evidence and, as well as, the testimony of Krohn and Powell.[51] Universal asserts that Honeywell's infringement expert, Hansman, was unable to identify an enabling envelope in either the SRD or the source code.

Universal also contends that Honeywell impermissibly "based its infringement claim on the proposition that the MGCB envelope, as depicted in Figure 4-26 of the SRD, constitutes both an enabling envelope and a warning system."[52] Universal maintains that, as a matter of law, Honeywell's position is unsupportable because limitation 3 requires two distinct elements: an "enabling envelope" and a "warning system." The "all elements rule" requires that "to prove infringement, every element in the claim must be found in the accused device either literally or equivalently."[53] According to Universal, "a structure which satisfies the 'enabling envelope' element of limitation 3 cannot also constitute the 'warning system' in that same limitation."[54] Universal argues further that an envelope implies a two or three dimensional space but states that Honeywell conceded that the outer boundary of the MGCB is a 15 NM line, not a space or area.

Honeywell responds that Universal inaccurately describes its position and the testimony presented at trial. Honeywell does not argue that the warning envelope, i.e.,

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[51] *See, e.g.*, Trial Tr. 1571:17-1572:1 (Krohn testifying that the MGCB warning envelope is enabled after take off and that the MGCB does not enable a separate warning system but constitutes a warning system in and of itself; "[t]he alerting envelope will only generate an alert when you penetrate the envelope."); Trial Tr. 1635:20-1636:7 (Powell testifying that Figure 4-26 illustrates an alerting envelope that is always on after an aircraft's takeoff).

[52] D.I. 192 at 21.

[53] *Id.* at 21-22 (quoting *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1562 (Fed. Cir. 1991)).

[54] *Id.* at 22.

the area of space around a destination airport in which an alert will be issued, is also the identical area of space that is an enabling envelope–which might be argued is contrary to the "all elements rule." Rather, Honeywell contends that it presented evidence that Universal's TAWS has both an enabling envelope and a warning system, thereby reading on limitation 3. The documentary evidence submitted to the jury on this issue included the SRD and the source code. Each of these documents was presented to the jury through the testimony of Honeywell's infringement expert, Hansman.

Honeywell also disagrees with Universal's assertion that Honeywell conceded that the outer boundary of the MGCB is a fifteen nautical mile line, and, therefore, that Universal's TAWS system necessarily lacks an enabling envelope (implying a two or three-dimensional area). Honeywell points out that the fifteen mile boundary is depicted as a line in Figure 4-26 of the SRD because that figure is a two dimensional drawing. Witnesses for both Honeywell and Universal testified that the fifteen mile boundary extends all the way around the destination airport, thus rebutting Universal's contention of Honeywell's purported concession.[55]

The court finds that sufficient evidence was presented at trial from which a reasonable jury could have found that the MGCB functionality of Universal's TAWS system contains both an enabling envelope and a separate warning system. The court notes, first, that whether the SRD specifically recites the words "enabling envelope," i.e., the precise words recited in claim 1 of the '436 patent, is not determinative of

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[55] *See* Trial Tr. at 869:21-23 (Hansman testifying that Figure 4-26 "is a side view, so when you swing it around, you get that beer can shape"); Trial Tr. at 1612:13-1613:13 (Krohn testifying that the fifteen mile boundary was like the walls of a stadium extending around the destination airport which, if viewed from above, would look like a circle).

whether Universal's accused product contains such an envelope. Hansman testified that Figure 4-26 of the SRD illustrates both an enabling envelope and a separate warning system.[56] As noted above, witnesses for both Universal and Honeywell agreed that the fifteen mile boundary illustrated in Figure 4-26 extends all the way around the airport, forming a circle. Hansman explained that the fifteen mile radius circle around a destination airport is the enabling envelope.[57] "[W]hen [an aircraft] get[s] within 15 nautical miles of the [destination airport], the set of limitations, in this case, the cross-hatched area, is activated. So this warning envelope for the MGCB is turned on once you get within 15 nautical miles."[58] Hansman testified that Universal's source code confirms that the MGCB does not give an alert until the aircraft is within 15 nautical miles of the airport: "[s]o you can see on the comment line, there's no alert beyond 15 nautical miles. So the system is enabled at 15 nautical miles."[59] No alert will issue even if an aircraft is within 15 miles of the destination airport unless it descends below certain minimum altitudes, triggering an alert.[60]

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[56] Trial Tr. 871:6-16 (Hansman responding to the question "Can you tell us how Figure 4-26 illustrates the activating or turning on of a set of limitations within which an aircraft can perform safely and effectively? A: Sure. It's probably easiest to think about it at the 15 nautical boundary. As you come inside 15 nautical miles, as you go inside that beer ca[n], the warning limitations is this warning envelope, so the crosshatched area is the area where you can perform safely and effectively."); Trial Tr. 870:10-14 (Hansman explaining that Figure 4-26 also illustrates a warning, or alerting, envelope and "the threshold at which you would get the alert if you went below that altitude and radio altitude").

[57] Trial Tr. at 869:17-20 ("The key enabling envelope is out here at the 15 nautical mile limit from the [destination airport].").

[58] Trial Tr. 713:8-14. Likewise, Powell stated that no alert will issue if an aircraft crosses the fifteen mile boundary of the destination airport and is above the MGCB alerting envelope, represented by the cross-hatched area in Figure 4-26. Trial Tr. 1710:20.

[59] Trial Tr. at 714-15. Although the comment line is not part of the active code, on cross examination concerning that comment line and the MGCB functionality, Powell confirmed that no MGCB alert will issue beyond fifteen miles of the destination airport. Trial Tr. 1708:5-6.

[60] Trial Tr. at 715:23-716:1 (Explaining what the source code for the MGCB does with reference to Figure 4-26 of the SRD, Hansman stated "[i]nside 15 nautical miles, you will get the alert if you get below the warning threshold or warning envelope.").

Based on the evidence submitted at trial, and Hansman's testimony regarding that evidence, the court finds that a reasonable jury could have determined that the MGCB functionality of Universal's TAWS is activated when an aircraft comes within fifteen miles of a destination airport. It is reasonable for the jury to have determined that within a fifteen mile radius of the destination airport that there is an area, above certain minimum altitudes, in which "an aircraft can perform safely and effectively," in which no warning will be issued and that there is a separate area, below certain minimum altitudes, in which "a system . . . monitor[ing] the flight conditions of [the] aircraft [will] provide a warning if flight conditions are such that an inadvertent contact with the ground is imminent."[61] That Universal's experts presented contrary testimony does not alter this finding, since on a JMOL motion the court is not to determine the credibility of witnesses or substitute its judgment for that of the jury.[62]

Consequently, the court denies Universal's motion for judgment as a matter of law on the issue of non-infringement.

B. Damages

To prevail on the issue of damages presented in its JMOL motion, Universal

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[61] Likewise, the jury could have understood Mr. Krohn's demonstration using a model aircraft equipped with a needle attached to its nose gear and a balloon representative of the MGCB. In that demonstration, the balloon popped–i.e., issued an alert–when the aircraft breached the MGCB envelope. The jury could, nevertheless, determine that the demonstration also showed an enabling envelope in the area above the balloon in which the warning envelope was activated but no alert would issue because the aircraft was operating "safely and effectively." Universal also contends that Honeywell improperly displayed a series of demonstrative exhibits that were subject to objection which "create[d] a fictitious MGCB envelope that was enabled when penetrated by an aircraft." D.I. 192 at 22-23. The court, however, permitted additional time in its closing arguments for Universal to address those exhibits. Furthermore, based on the court's finding that sufficient evidence was presented during trial from which a reasonable jury reached its verdict, the court determines that Honeywell's display of those demonstrative exhibits does not warrant granting Universal's JMOL motion.

[62] *Arthrocare Corp. v. Smith & Nephew Inc.*, 310 F. Supp. 2d 638, 652 (D. Del. 2004).

must demonstrate that the jury's award of royalties was not supported by substantial evidence presented at trial. Substantial evidence is defined as "such relevant evidence from the record taken as a whole as might be acceptable by a reasonable mind as adequate to support the finding under review."[63] When evaluating a motion for a JMOL, the court must consider all the evidence in a light most favorable to the non-movant[64] and must draw all inferences in favor of the non-movant.[65] Furthermore, the jury's award of damages is entitled to deference[66] and must be upheld unless it is grossly excessive.[67]

Universal contends that the jury award of $5,448,000 in damages (which represents an effective royalty rate of 26%) was excessive and unsupported by substantial evidence at trial.[68] Universal argues that the sole evidence introduced by Honeywell to support its damages claim was testimony from its damages expert, Julie Davis and that Davis' analysis was not supported by substantial evidence. Universal also argues that additional evidence presented at trial detracted from Davis' testimony.

Universal argues that, with one exception, "Davis excluded all signed licenses that were in existence from her analysis, without regard to how close in time to the hypothetical negotiation date, or how similar the technology which was covered."[69] The

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[63] *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 893 (Fed. Cir. 1984).
[64] *Dana Corp. v. IPC Limited Partnership*, 860 F.2d 415, 417 (Fed. Cir. 1988).
[65] *Arthrocare Corp.*, 310 F. Supp. 2d at 652.
[66] *Monsanto Co. v. Ralph*, 382 F. 3d 1374, 1383 (Fed. Cir. 2004).
[67] *Brooktree Corp. v. Advanced Micro Devices Inc.*, 977 F. 2d 1555, 1580 (Fed. Cir. 1992).
[68] To arrive at this figure, Davis testified that a reasonable royalty rate for Universal's Class A TAWS was $6,000 per unit, Trial Tr. 995:22-996:4, and for Universal's Class B TAWS was $3,000 per unit. Trial Tr. 979:2-980:8 Davis then multiplied those two figures by the number of units sold for each class of TAWS to arrive at the proposed reasonable royalty of $5,448,000 for all infringing products sold. Trial Tr. 979:8-18.
[69] D.I. 192 at 24.

one exception was a license, between Honeywell Intellectual Properties Inc. ("HIPI") and Honeywell International Inc. (the "HIPI license"). Universal asserts that the HIPI license does not provide a sufficient basis for Davis' testimony because that license established a 17% royalty while Davis' proposed royalty rate for Universal's Class A TAWS equated to an effective royalty rate of 26%.[70] Universal also argues that Davis' analysis omitted two relevant licenses in her analysis: a license between Boeing and AlliedSignal (a predecessor company to Honeywell) and between Honeywell and Thales/ACSS (the "Boeing license" and the "Thales licence").[71]

Universal also contends that additional evidence undermines Davis' opinions. At trial, Universal introduced evidence which it contends demonstrates that: the '436 patent technology was given away for free as part of a software upgrade;[72] that the '436 patent technology was not the reason Honeywell's customers purchased its EGPWS products;[73] that in October 1998[74] the '436 patent technology was not integral to Honeywell's EGPWS;[75] and that part of Davis' testimony was based on unsubstantiated opinions.[76] Universal also contends that Davis' opinion of a reasonable royalty rate in this case is further undermined by her damages opinion offered in a prior case between

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[70] An amendment to the HIPI license, effective September 1, 2001, established a royalty rate of 17% for commercial avionics products. Trial Tr. 1001:5-1005:7.

[71] Universal argues that these licenses were relevant because the Boeing license dated September 13, 1996 set a royalty rate of $25,000 for "Ground Proximity Warning System" data, and the patent was cited on the first page of the '436 patent, therefore including the technology at issue here. Trial Tr. 1017:13-1018:16. Secondly, Universal contends that the Thales license covered the same technology that is at issue in the present case and was royalty free. Trial Tr. 1032:14-1033:11.

[72] Trial Tr. 991:20-992:6.

[73] Trial Tr. 993:14-994:3.

[74] The parties agree that the date for the hypothetical negotiation between Honeywell and Universal for a license for the '436 patent technology would have occurred on October 1998. Trial Tr. 998:9-14, 1743:12-18.

[75] Trial Tr. 1036:22-1037:9.

[76] Trial Tr. 1064: 8-17.

the parties involving the five Honeywell look-ahead patents. In that case, Davis opined that the reasonable royalty rate for those five patents was exactly the same rate she concluded was reasonable for the single patent at issue in this case.

According to Universal, if the Court upholds the jury's finding of infringement the evidence suggests that maximum appropriate damages is substantially less than that awarded by the jury. In support of a lower appropriate damages amount, Universal points to the testimony of its damage's expert, Dr. Richard Gering. Analyzing several executed licenses and settlement agreements in the relevant field, Gering concluded that the appropriate reasonable royalty would be $300 per class A unit and $150 per Class B.[77] Universal argues that using Gering's calculations, damages should not exceed $272,400.[78]

Honeywell argues that the jury's damage award is fully supported by the substantial evidence presented at trial and was not grossly excessive. Specifically, Honeywell points out that Davis considered each of the fifteen *Georgia-Pacific*[79] factors in her determination of the appropriate royalty. Honeywell also maintains that Davis provided testimony rebutting the additional evidence purportedly supporting a lower royalty rate than awarded by the jury.

For the reasons discussed below, the court determines that Universal's JMOL motion on the issue of damages must be denied.

With regard to whether an effective royalty rate of 26% is excessive, Davis

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[77] Trial Tr. 1741:23-1750:21.

[78] Trial Tr. 1750:1-20.

[79] *See Dow Chem. Co. v. Mee Industries, Inc.*, 341 F.3d 1370, 1382 (Fed. Cir. 2003) (referencing *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (D.C.N.Y. 1970)).

considered a number of factors, including Universal's high profit margin,[80] the field's normative royalty range ("rule of thumb" range),[81] and the fact that Honeywell and Universal are direct competitors in the relevant market.[82] Based on these factors Davis concluded that the royalties awarded to Honeywell should be at the higher end of the normative range.[83]

Davis also explained why she believed the Boeing and Thales licenses were not relevant to her damages opinion. Davis testified that she had reviewed the Boeing license and had concluded that it was not relevant because the technology was never used by Honeywell; there was only one year remaining on the patent's life; and Allied-Signal (a Honeywell predecessor corporation) and Boeing were not competitors with respect to the licensed technology.[84] With regard to the Thales' license, Davis concluded that it was not relevant because it was a cross-license of Honeywell's and ACSS's patent portfolios and thus did not involve the determination of a royalty rate.[85]

Additionally, Universal's contention that Davis' royalty calculation was

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[80] Trial Tr. 1779:22-1781:19 (Universal's witness agreeing that Davis calculated Universal's profit margin accurately).

[81] Trial Tr. 974:3-24. Davis testified that the licensing industry's "rule of thumb" is that a royalty should be "equal to one-quarter to one-third of the profits attributable to the invention." Trial Tr. 974:3-12. For instance, Davis' calculations suggested a possible range of royalties from $2,000 to $6,250 for Universal's Class A systems. Trial Tr. 975:1-977:4. Davis' proposed royalty rate of $6,000 (equating to a 26% royalty rate), Trial Tr. 977:14-18, falls within the rule of thumb and is lower than the $6,650 rate (or a 33% royalty rate) at the high end of the rule of thumb range. Trial Tr. 975:21-24. Davis testified that, although the rule of thumb "is not a sound rule, but it's something that licensing experts think about, and people involved in negotiations think about." Trial Tr. 974:5-8. As with all of the testimony, the jury gave the weight it deemed appropriate to Davis' conclusions in determining the level of damages awarded.

[82] Trial Tr. 971:1-972:21.

[83] Trial Tr. 976:22-979:1.

[84] Trial Tr. 1101:1-1102:8.

[85] Trial Tr. 1070:7-24, 1102:14-21. The significance of Davis not considering the Boeing and Thales license in her analysis was a matter for the jury to decide. *Fuji Photo Film Co., Ltd. v. Jazz Photo Corp.*, 394 F.3d 1368, 1378 (Fed. Cir. 2005) (affirming the jury's royalty award and rejecting infringer's argument "that the jury should have accorded more weight to Fuji's prior license agreements").

undermined by her previous opinions regarding the look-ahead patents is not persuasive. The court finds that a reasonable jury could agree with Davis' testimony concerning why her estimation of royalty rates for the five look-ahead patents was the same as that for the single '436 patent. Whether one patent or five is necessary for a product, an infringer cannot sell its product without a license.[86] For the same reason, a reasonable jury could have believed it was irrelevant whether Honeywell established that the '436 patent technology drove customers' demand for its products. Since Universal's TAWS was found to infringe the '436 patent, it must license that technology.

The court also disagrees with Universal's argument that the '436 patent technology had little value because it was allegedly "given away for free." Davis testified that the '436 patent technology was only given away to customers who had all ready bought and paid for the EGPWS system.[87] Universal was not a customer who had bought and paid for the EGPWS system. A reasonable jury could accept Davis' testimony regarding the sound business reasons for providing free software upgrades to its customers.[88]

Despite Universal's contention that the evidence does not support the jury's damages award, the jury was presented with opposing arguments (and evidence in support thereof) by each parties' damages experts. The credibility of each expert and

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[86] Trial Tr. 1104:1-19. Davis explained that, "it shouldn't matter how many patents are involved if what Universal gets out of the deal is the right to sell a product that's going to generate profits of X amount, and it's the same product and it's the same profits, and therefore, it should be the same royalty that would be paid for the same right."

[87] Trial Tr. 1104:20-1106:7.

[88] Trial Tr. 1104:20-1105:23. Davis explained that it is a sound business practice to give away free upgrades as this practice allows the company to secure a "high initial price" and it deters customers from delaying the purchase of the product.

the weight given the evidence presented was to be determined by the jury and deference must be given to the jury's decision.[89]

Considering all the evidence in a light most favorable to Honeywell, a reasonable jury could have determined that the awarded damages was appropriate. Universal did not point to evidence that demonstrated that the jury's verdict was " grossly excessive or monstrous, clearly not supported by the evidence, or based only on speculation or guesswork."[90] Consequently, giving appropriate deference to the jury's damages award, Universal's JMOL motion on the issue of the damages is denied.

V. CONCLUSION

The court has considered all of the parties' arguments and conducted a *de novo* review of the evidence presented at trial. Having considered all of the evidence in the light most favorable to Honeywell, and drawing all inferences in its favor, the court denies Universal's motion for judgment as a matter of law that the MGCB functionality of SCN11.0 does not infringe claim 1 of the '436 patent. Additionally, having found that the record supports the jury's damages award, the court also denies Universal's motion for judgment as a matter of law on the issue of damages.

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[89] *Arthrocare Corp. v. Smith & Nephew Inc.*, 310 F. Supp. 2d at 652.
[90] *Monsanto Co. v. Ralph*, 382 F. 3d 1374, 1383 (Fed. Cir. 2004).

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF DELAWARE

HONEYWELL INTERNATIONAL INC. and HONEYWELL INTELLECTUAL PROPERTIES INC., Plaintiffs.	)	
v.	)	C. A. No. 03-242-MPT
UNIVERSAL AVIONICS SYSTEMS CORP. and SANDEL AVIONICS, INC., Defendants.	)	

AMENDED ORDER

At Wilmington, Delaware, this **7th** day of **April, 2006**.

For the reasons stated in this court's April 7, 2006 Memorandum Opinion,

IT IS ORDERED THAT:

Universal's renewed motions for judgment as a matter of law (D.I. 192,193) are **DENIED**.

UNITED STATES MAGISTRATE JUDGE