In the United States Court of Federal Claims

No. 02-1909C
Filed: April 14, 2008
TO BE PUBLISHED
(CORRECTED)

	*	Anticipation, 35 U.S.C. § 102(a), (b);
HONEYWELL INTERNATIONAL INC.,	*	Best Mode;
and HONEYWELL INTELLECTUAL	*	Definiteness, 35 U.S.C. § 112 ¶ 2;
PROPERTIES INC.,	*	Disclosure, 35 U.S.C. § 112 ¶ 1;
	*	Enablement;
Plaintiffs,	*	"First Sale" Doctrine;
	*	Implied License;
v.	*	Inequitable Conduct;
	*	Jurisdiction;
THE UNITED STATES,	*	Obviousness;
	*	Ordinary Skill In The Art;
Defendant,	*	Patent Act, 35 U.S.C. §§ 102(a),(b),
	*	112, 282;
LOCKHEED MARTIN CORP.,	*	Patent Infringement Defenses;
	*	Prior Art;
Defendant-Intervenor, and,	*	Prosecution Laches;
	*	Secondary Considerations;
L-3 COMMUNICATIONS CORP.,	*	Teaching Away;
	*	Validity, 35 U.S.C. § 282.
Defendant-Intervenor.	*	

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MEMORANDUM OPINION[1]
REGARDING PATENT INFRINGEMENT DEFENSES.

The Government and Defendant-Intervenors have asserted ten patent infringement defenses including: validity; anticipation; obviousness; the written description requirement; enablement; best mode; definiteness; the "first sale" doctrine; inequitable conduct; and prosecution laches.

The court has determined herein that claim 2 of the '914 patent was obvious and failed to meet the written description requirement of Section 112 ¶ 1 of the Patent Act, 35 U.S.C. § 112. In addition, Honeywell is barred from recovering damages from the Government under the "First Sale" Doctrine.

To facilitate a review of this Memorandum Opinion regarding the patent infringement defenses asserted in this case, the court has provided the following outline:

[1] On April 3, 2008, a pre-publication draft of the Memorandum Opinion was provided under seal to the parties. The parties were instructed to propose any redactions on or before April 14, 2008. On April 14, 2008, this Memorandum Opinion was published..

b. Comparison Of The Construed Claims Against The Prior Art.

i. "A display system"

ii. "for use in association with a light amplifying passive night vision aid"

iii. "and a local color display"

iv. "including a local source of light having blue, red, and green color bands"

v. "a first filter for filtering the blue color band of the local source of light"

vi. "a second filter for filtering the green color band of the local source of light"

vii. "a third filter for filtering the red color band of the local source of light and passing a narrowband of the red color band"

viii. "a fourth filter which filters light at the night vision aid, said fourth filter cooperating with said plurality of filters to substantially block at least said narrowband of the red color band from being admitted to the night vision aid"

3. Obviousness.

a. Governing Precedent.

b. The Scope And Content Of The Prior Art.

c. The Level Of Ordinary Skill In The Art.

d. The Differences Between The Prior Art And Claims At Issue.

i. Comparison Of The Elements Of Claim 2 Of The '914 Parent With Prior Art.

(a) Claim 2 Preamble: "A Display System For Use In Association With A Light Amplifying Passive Night Vision Aid And A Local Color Display Including A Local Source Of Light Having Blue, Red, And Green Color Bands."

(1) Uncontested Prior Art.

(2) TASK & GRIFFIN III And KNIGHT & RITTER.

(3) GERMAN PATENT.

(b) Claims 2(a), 2(a)(1), 2(a)(2): "A Plurality Of Filters At The Local Color Display including (1) A First Filter For Filtering The Blue Color Band Of The Local Source Of Light; (2) A Second Filter For Filtering The Green Color Band Of The Local Source Of Light."

(1) UCHIDA, STOLOV, and VERNEY.

(2) TASK ARTICLES.

(c) Claim 2(a)(3): "A Third Filter For Filtering The Red Color Band Of The Local Source Of Light And Passing A Narrowband Of The Red Color Band."

(1) TASK & GRIFFIN I And KNIGHT & RITTER.

(2) BOEHM.

(3) GERMAN PATENT.

(4) SCOUGHTON.

(5) VERNEY.

(d) Claim 2(b): "A Fourth Filter Which Filters Light At The Night Vision Aid, Said Fourth Filter Cooperating With Said Plurality Of Filters To Substantially Block At Least Said Narrowband Of The Red Color Band From Being Admitted To The Night Vision Aid."

(1) BOEHM.

6. The "First Sale" Doctrine.

7. Inequitable Conduct.

8. Prosecution Laches.

III. CONCLUSION.

* * *

I. RELEVANT FACTUAL BACKGROUND AND PROCEDURAL HISTORY.[2][3]

The United States military uses night vision goggles ("NVG") to assist pilots in operating rotary and fixed wing aircraft, because NVGs create a brighter night view of terrain outside the cockpit. *See Honeywell III*, 70 Fed. Cl. at 437-38. In addition, NVGs can amplify interior cockpit lights. *Id*. Dual amplification, however, can distort pilot vision by interrupting NVG functionality. *Id.* Aviation Night Vision Imaging System ("ANVIS") goggles solved part of the distortion problem, because they were not sensitive to light with a visible wavelength below 580 nanometers ("nm"). *Id.* at 440. ANVIS also used "automatic gain control" to prevent intense light from overwhelming the sensors in the goggles. *Id.* In addition, automatic gain control reduced the intensity of all lights and the ability of pilots to see light outside, as well as inside, the cockpit. *Id.* Light with a wavelength above 580 nm, however, continued to limit the visible colors that could be used in the cockpit. *Id.* at 437-40. In the mid-1980's, Mr. Richard Cohen, an employee of Allied Signal

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[2] Incorporated herein are four prior Memoranda Opinions of the court that provide an extensive discussion about the technology at issue in this patent case and the background of the patent at issue: *Honeywell Int'l, Inc*. v. *United States*, 65 Fed. Cl. 809 (2005) ("*Honeywell I*") (jurisdiction); *Honeywell Int'l, Inc*. v. *United States*, 66 Fed. Cl. 400 (2005) ("*Honeywell II*") (granting Lockheed Martin Corp. intervenor status and *Markman* proceedings to construe certain claims requested by the parties); *Honeywell Int'l, Inc*. v. *United States*, 70 Fed. Cl. 424 (2006) ("*Honeywell III*") (determining literal infringement, or alternatively, under the Doctrine of Equivalents as to claim 2 of the '914 Patent); and *Honeywell Int'l, Inc*. v. *United States*, 71 Fed. Cl. 759 (2006) ("*Honeywell IV*") (granting L-3 Communications Corp.'s Motion to Intervene). In addition, Honeywell's claims under the Invention Secrecy Act as subject to a separate Memorandum Opinion also issued on this date. *See Honeywell Int'l, Inc*. v. *United States*, __ Fed. Cl. __ (2008) ("*Honeywell V*") (Invention Secrecy Act).

[3] The procedural history of this case between December 18, 2002 and the June 14, 2005 Memorandum Opinion and Order is set forth in *Honeywell II*, 66 Fed. Cl. at 413-18. The procedural history of this case between June 14, 2005 and the April 28, 2006 Memorandum Opinion and Order is set forth in *Honeywell III*, 70 Fed. Cl. at 433-37.

Technologies, Inc. ("Allied Signal")[4], attempted to solve the problem of using red light and full-color displays in cockpits, together with NVGs. *Id*. On October 10, 1985, Allied Signal filed United States Patent Application Serial No. 06/786,269 ("the '269 Application"). *Id.* at 413-14, 444. On October 22, 2002, United States Patent No. 6,467,914 ("the '914 patent") was issued to Honeywell. *Id.*

On December 18, 2002, Honeywell International Inc. and Honeywell Intellectual Properties Inc. (collectively hereafter "Honeywell") filed a Complaint in the United States Court of Federal Claims alleging that the United States ("the Government") violated: (1) the Invention Secrecy Act of 1951, 35 U.S.C. §§ 181-88, as a result of the Government's issuance of Secrecy Orders regarding U.S. Patent Application Serial No. 06/786,268 ("the '268 Application"); (2) the Fifth Amendment to the United States Constitution, as a result of the Government's taking of Honeywell's '914 patent and related '269 Application; (3) 28 U.S.C. § 1498(a), as a result of the unlicensed, or otherwise unlawful, use of the U.S. Patent No. 6,142,637 ("the '637 patent") and the '914 patent by or on behalf of the Government; and (4) the Fifth Amendment to the United States Constitution for the taking of the '637 and '914 patents for public use without just compensation. *See* Compl. ¶¶ 1, 53-75. ("Compl.").

On May 31, 2005, Honeywell filed an Amended Complaint ("Amend. Compl.") seeking recovery: "(a) under the Invention Secrecy Act of 1951, 35 U.S.C. §§181-88, by reason of the Government's issuance of a Secrecy Order with respect to [the '269 Application;] . . . (b) under 28 U.S.C. §1498(a), for the unlicensed (or otherwise unlawful) use of the . . . ['914 patent; and] . . . (c) under the Fifth Amendment [to the United States Constitution][5], for the Government's taking and use of Honeywell's patent rights associated with '269 patent application and '914 patent . . . for public use without just compensation to Honeywell." *See* Amend. Compl. ¶ 1.[6]

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[4] In 1985, Allied Corporation merged with Signal Companies and became Allied Signal Corporation. *See Honeywell*, 70 Fed. Cl. at 444. On December 16, 1999, Allied Signal Corporation merged with Honeywell International Inc. *Id*. As a result, Honeywell International Inc's subsidiary, Honeywell Intellectual Properties Inc., became the owner of the '269 Application. *Id*. A detailed discussion of the patent's ownership and Plaintiffs' corporate structure is found in *Honeywell III*, 70 Fed. Cl. at 444.

[5] The December 18, 2002 Complaint alleged that the Government infringed the '268 Application and the '637 patent. Subsequently, Honeywell relinquished infringement claims regarding the '268 Application and '637 patent. *See* 12/23/04 Honeywell Brief at 1 n.1; *see also* 5/13/05 Honeywell Mot.

[6] On June 14, 2006, Honeywell filed a Motion for Entry of A Stipulated Order Dismissing Count III of the Amended Complaint, in light of the United States Court of Appeals for the Federal Circuit's decision in *Zoltek Corp.* v. *United States*, 442 F.3d 1345, 1353 (Fed. Cir. 2006) (holding that patent infringement claims cannot be asserted as a Fifth Amendment taking under the Tucker Act). On June 15, 2006, the court entered an order dismissing Count III of Honeywell's Amended

On April 28, 2006, the court issued a Memorandum Opinion and Order determining that Honeywell established a *prima facie* case of literal infringement as to claim 2 of the ' 914 patent or, in the alternative, under the Doctrine of Equivalents. *See Honeywell III*, 70 Fed. Cl. at 424.

From July 24-27, 2006 the court held a hearing on the Invention Secrecy Act. *See* SA TR 1-1079. On November 13-15, 2006 and December 11-15, 2006, the court held a hearing on defenses asserted by the Government and/or Defendant-Intervenors. *See* TR at 1-840.[7]

Complaint, subject to the United States Supreme Court's consideration of a petition for certiorari. On June 11, 2007, the petition was denied. *See Zoltek Corp.* v. *United States*, 127 S. Ct. 1236 (June 11, 2007). Accordingly, Count III of the Amended Complaint is dismissed, with prejudice.

[7] The Government and Defendant-Intervenors' witnesses at the evidentiary hearing on defenses were: Mr. Charles Edward Bradford, Electronics Engineer, Night-Vision and Electronic Sensors Directorate, Fort Belvior, Virginia (TR 119-211); Mr. William Dunn, President and CEO, Manufacturing Resources International (TR 213-330); Mr. Ferdinand Reetz, III, Lead Engineer, C-130 Program, Naval Air Warfare Center, Patuxent River, Maryland (TR 330-502); and Dr. Harry Lee Task, Independent Consultant, Former Senior Scientist for Human Systems Interface, Air Force Research Laboratory (TR 503-838, 2341-48, 2756-83).

Honeywell's witnesses were: Colonel William S. Lawrence, United States Marine Corps (Retired) (TR 937-1038, 1511-13, 1920-57); and Mr. Lawrence E. Tannas, Consultant, Tannas Electronic Displays, Inc. (TR 1048-1510).

The court determined during the *Markman* proceeding that Mr. Tannas met the qualifications of Fed. R. Ev. 702-03. *See Honeywell II*, 66 Fed. Cl. at 416. A discussion of Mr. Tannas's impressive credentials also is discussed therein. In addition, the court determined that Dr. Harry Lee Task met the qualifications of Fed. R. Ev. 702-03. *Id*. at 417. A discussion of Dr. Task's equally impressive credentials also is discussed therein. *Id*.

Three additional experts appeared during the evidentiary hearing on defenses. Mr. Bradford has worked with NVGs as a technician and engineer since 1972. *See* TR 119-21. The court has determined that Mr. Bradford met the qualifications of Fed. R. Ev. 702-03. Mr. Dunn has a Bachelor of Science in Electrical Engineering and has worked as an engineer since 1973. *See* TR 213-17. The court has determined that Mr. Dunn met the qualifications of Fed. R. Ev. 702-03. In addition, Colonel William S. Lawrence, United States Marine Corps (Retired) also was an expert witness for Honeywell. *See* PTX 1352 at 1. Col. Lawrence has over 26 years of experience as a U.S. Marine Corps pilot in both rotary and fixed wing aircraft. *Id.* Col. Lawrence has flown with NVGs and has worked on cockpit display systems. *Id.* The court has determined that Col. Lawrence met the qualifications of Fed. R. Ev. 702-03.

On February 27-March 2, 2007, the court held a trial on potential damages.

On August 24, 2007, Defendant-Intervenor Lockheed Martin Corp. ("Lockheed Martin") filed a Post-Trial Memorandum Regarding Defenses to Infringement [8] and the Government filed a Post-Trial Brief on Defenses to Infringement ("Gov't PT Def"). On the same date, Defendant-Intervenor L-3 Communications Corp. ("L-3") filed a Post-Trial Brief Regarding Defenses ("L-3 PT Def").

On October 12, 2007, Honeywell filed a Corrected Post-Trial Opposition Brief Regarding Defenses ("Pl PT Op Def").

On November 2, 2007, Honeywell filed a Post-Trial Brief Regarding Damages. On November 9, 2007, L-3 filed a Reply to Honeywell's Post-Trial Opposition Brief Regarding Defenses ("L-3 Def Reply"). On November 10, 2007, the Government filed a Reply ("Gov't Def Reply") and a Motion to Strike Portions of Honeywell's Opposition Brief or, in the Alternative, Cross-Motion to Strike the Government's New Obviousness Defense Based Upon [Prior Art] VERNEY (DE-511) ("Gov't Mot. to Strike"). On November 13, 2007, the Government filed a Motion for Leave to File Corrected Post-Trial Reply Brief. On November 26, 2007, Honeywell filed a Response to the Government's November 10, 2007 Motion.

On December 7, 2007, the Government filed a Reply in Support of Its Motion to Strike ("Gov't Mot. to Strike Reply"). On December 18, 2007, Honeywell filed a Reply in Support of a Cross-Motion to Strike the Government's New Obviousness Defense Based On VERNEY Alone.

II. DISCUSSION.

A. Jurisdiction And Standing.

The United States Court of Federal Claims has jurisdiction to adjudicate claims that allege "an invention described in and covered by a patent of the United States is used or manufactured by or for the United States without license of the owner thereof or lawful right to use or manufacture the same . . . [seeking] recovery of . . . reasonable and entire compensation for such use and manufacture." 28 U.S.C. § 1498(a). Previously, the court determined that Honeywell properly alleged jurisdiction. *See Honeywell II*, 66 Fed. Cl. at 419-20; *see also Honeywell III*, 70 Fed. Cl. at 446.

In addition, the court previously determined that Honeywell has standing to assert claims of infringement. *See Honeywell II*, 66 Fed. Cl. at 420; *see also Honeywell III*, 70 Fed. Cl. at 446. Likewise, the court has determined that Lockheed Martin and L-3 have standing to intervene in this case, as a matter of right, pursuant to RCFC 24(a). *See Honeywell II*, 66 Fed. Cl. at 421 (regarding Lockheed Martin); *Honeywell III*, 70 Fed. Cl. at 446 (regarding Lockheed Martin); *Honeywell IV*, 71 Fed. Cl. at 767 (regarding L-3).

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[8] In the Post-Trial Memorandum Regarding Defenses to Infringement, Lockheed adopted the "Government's and L-3's Post-Trial Memorandum Regarding Defenses to Infringement."

B. The Court's Determination Regarding Scope And Content Of Prior Art.

The Government initially presented twenty-five prior art references and continues to assert nineteen.[9] *See* DE 500 at ii-iii (Task Direct); Gov't PT Def at 8-10; *see also* TR 719 (asserting DE 301, 504-06, 510, 515, 517, 519, 521 and DMX 4 are within the scope and content of the relevant art).

1. The Parties' Agreement Regarding Certain Prior Art Relevant In This Case.

The parties agree that the following sixteen references are prior art:

- U.S. Patent No. 4,515,442, entitled Optical Filter Device, issued May 7, 1985 ("the '442 patent") (DE 501);
- U.S. Patent No. 4,245,242, entitled Contrast Enhancement of Multicolor Displays, issued January 13, 1981 ("the '242 patent") (DE 502);
- U.S. Patent No. 4,663,562, entitled Contrast Enhancement Structure for Color Cathode Ray Tube, issued May 5, 1987 ("the '562 patent") (DE 503);
- U.S. Patent No. 4,219,843, entitled Projection Type Color Television System, issued August 26, 1980 ("the '843 patent") (DE 518);
- The Night Vision Goggle Compatible Helicopter Cockpit, H.D.V. Boehm, Tenth European Rotorcraft Forum, August 28-31, 1984, The Hague, The Netherlands, pp. 40-1-40-26 ("BOEHM") (DMX 4);
- Aircraft Night Lighting Systems, Maj. Chesley S. Pieroway, Business Aircraft Meeting & Exposition, April 12-15, 1983, Wichita, Kansas, SAE Technical Paper Series #830713, pp. 1-4 ("PIEROWAY I") (DE 512);

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[9] Five of the Government's initial prior art references have been withdrawn: BRIETMAIER AND REETZ (DE 146); BERTELSON (DE 516); AERONAUTICAL DESIGN STANDARD (DE 517); TA-7C REPORT (DE 324); and PIEROWAY II (DE 520). *See* Gov't PT Def at 10 n.1.

The Government, however, argues that these references remain relevant to determine the level of skill in the art. *Id*. (citing *Thomas & Betts Corp*. v. *Litton Sys. Inc.*, 720 F.2d 1572, 1580-81 (Fed. Cir. 1983) ("[T]he [evidence], though not technically prior art, [was], in effect, properly used as indicators of the level of ordinary skill in the art to which the invention pertained.") (citations omitted); *see also Lockheed Aircraft Corp.* v. *United States*, 553 F.2d 69, 78 (Ct. Cl. 1977) ("It is clear that these reports . . . are not prior art within the meaning of 35 U.S.C. §§ 102 or 103 . . . [n]evertheless, such classified reports are indicative of the general level of skill in the art.") (citations omitted).

- Helicopter Cockpit Avionics Development or the Advanced Transport and Next Generation Aircraft, Craig Scoughton, Robert Johnston, and Richard Cohen, presented at the National Specialists Meeting on Advanced Cockpit Design by the American Helicopter Society, Grapevine, Texas, October 3-4, 1984 ("SCOUGHTON") (DE 522);

- Helicopter Cockpit Design for Night Goggle Compatibility, G.F.H. Lloyd, Paper No. 64, presented at Sixth European Rotorcraft and Powered Lift Aircraft Forum, Bristol, England, September 16-19, 1980 ("LLOYD") (DE 521);

- Electroluminescent Lighting and Other Techniques for Improving Night Vision Goggles Compatibility with Cockpit Displays, H. L. Task and L.L. Griffin, AGARD (Advanced Group For Aerospace Research & Development), Conference Proceedings No. 329, Advanced Avionics and The Military Aircraft Man/Machine Interface, 1982, Blackpool, UK, NTIS No. AGARD-CP-329), pp. 29-1-29-6 ("TASK & GRIFFIN I") (DE 506);

- Pave Low III: Interior Lighting Reconfiguration for Night Lighting and Night Vision Goggle Compatibility, H.L. Task & L.L. Griffin, Aviation Psychology III: Aviation, Space, and Environmental Medicine, December 1982, AFAMRL-TR-82-3, pp. 1162-65 ("TASK & GRIFFIN II") (DE 507);

- Hughes Helicopters AH-64A Electroluminescent Lighting, Tom C. Knight and James E. Ritter, presented at the National Specialists Meeting on Advanced Cockpit Design by the American Helicopter Society, Grapevine, Texas, October 3-4, 1984 ("KNIGHT AND RITTER") (DE 513);

- Aircraft Lighting Systems, Jay F. Verney, American Helicopter Society, 41st Annual Forum Proceedings, May 15-17, 1985, Ft. Worth, Texas, pp. 111-12 ("VERNEY") (DE 511);

- Overview of Advanced Display Technologies, J. Robert Trimmier, presented at the National Specialists Meeting on Advanced Cockpit Design by the American Helicopter Society, Grapevine, Texas, October 3-4, 1984 ("TRIMMIER") (DE 514);

- German Patent Application, published as DE 33 13 899 Al, on October 18, 1984 and translation ("GERMAN PATENT") (DE 504, 505);

- Night Vision Goggle Compatibility, What Is It And How Do We Get It? And Other AFAMRL NVG Efforts, H. Lee Task ("TASK IV") (DE 509, 510); and

- Pave Low III: Interior Lighting Reconfiguration For Night Lighting And Night Vision Goggles, H.L. Task and L.L. Griffin ("TASK & GRIFFIN III") (DE 508).

2. The UCHIDA[10] And STOLOV[11] References Are Prior Art.

Honeywell argues that the liquid crystal display ("LCD") technology in UCHIDA (DE 515) and STOLOV (DE 519) are not analogous, as they are not within the same field of endeavor as the '914 patent and do not relate to "aircraft cockpits or NVG compatibility[.]" *See* Pl PT Op Def at 14. Moreover, the court would have to engage in "hindsight," if it considered UCHIDA and STOLOV. *Id.*

Intervenor L-3 counters that the LCD technology in UCHIDA is in the same field of endeavor as the '914 patent, because that field is not limited to aircraft cockpits. *See* L-3 PT Def at 22-23 ("Indeed, neither 'aircraft' nor 'cockpit' is ever used in [c]laim 2."). Other prior art references, however, directly "suggest[] the use of CRTs and LCDs . . . in aircraft cockpits." *Id*. at 23 (citing DE 514 at GVT018-1662; DMX 4 ("BOEHM") at D000587, D000606; DE 511 ("VERNEY") at GVT009-0782). Even if LCDs are not in the same field of endeavor, UCHIDA and STOLOV are "reasonably pertinent" to NVG compatibility with full color displays. *Id.* at 22-23 (citing *In re Icon Health & Fitness, Inc.*, 496 F.3d 1374, 1379-1380 (Fed. Cir. 2007) (bed springs were "reasonably pertinent" to problems faced in treadmill art)); *see also* Gov't Def Reply at 6 ("UCHIDA's full color displays are sufficiently close to the problem of the '914 patent to be considered.") (citation omitted).

The United States Court of Appeals for the Federal Circuit requires trial courts to analyze two factors in determining whether prior art is analogous: "(1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved." *In re Clay*, 966 F.2d 656, 658-59 (Fed. Cir. 1992) (citations omitted). The determination of relevant prior art is a question of fact. *Id.* at 658 ("Whether a reference in the prior art is 'analogous' is a fact question.").

Claim 2 of the '914 patent preamble describes the invention as: "A *display system* for use in association with a light amplifying passive night vision aid and a *local color display* including a local source of light[.]" *See* DMX 36 at D000650 ('914 patent, col. 5, ll. 31-33, col. 6, ll. 11-13) (emphasis added). Therefore, the field of endeavor is not limited to a NVG compatible display system that could be used in aircraft cockpits. UCHIDA discloses a "liquid crystal multicolor *display*" and that LCDs, as of 1981, "increasingly [were] being used in displays for portable instruments." DE 515 at GVT009-0486 (emphasis added). Likewise, STOLOV is a "picture system includ[ing] a

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[10] A Liquid Crystal Multicolor Display Using Color Filters, Tatsuo UCHIDA, presented at Eurodisplay 1981, September 16-18, 1981 ("UCHIDA") (DE 515).

[11] U.S. Patent No. 4,368,963, entitled Multicolor Image or Picture Projection System Using Electronically Controlled Slides issued January 18, 1983 ("STOLOV") (DE 519).

flat screen, on which is projected pictures from three small liquid crystal display panels[.]" *See* DE 519 at 1. Therefore, the court has determined that UCHIDA and STOLOV describe color display systems that could be used in aircraft cockpits and are in the same field of endeavor as the '914 patent. *See In re Clay*, 966 F.2d at 658-69.

Assuming, *arguendo*, that UCHIDA and STOLOV were not in the same field of endeavor as the '914 patent, they would be "analogous art," because they are "reasonably pertinent" to the type of display system described in the '914 patent. A reference is analogous art if "even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem." *Id.* at 659; *see also KSR Int'l Co.* v. *Teleflex Inc.*, 127 S. Ct. 1727, 1742 (2007) ("*KSR*") ("[F]amiliar items may have obvious uses beyond their primary purposes."); *In re Paulsen*, 30 F.3d 1475, 1481-82 (Fed. Cir. 1994) (determining that housings, hinges, laches, and springs found in items like a piano lid and kitchen cabinet were reasonably pertinent to the development of a latch system for personal computers); *In re Icon*, 496 F.3d at 1379-80 (determining that springs used in a folding bed were reasonably pertinent to an inventor developing a treadmill with a folding mechanism).

In this case, the '914 patent describes a "display system" compatible with NVGs. *See* DMX 36 at D000650 ('914 patent, col. 5, ll. 31-33, col. 6, ll. 11-13). The '914 patent describes the problem to be solved as a full color display compatible with NVGs, but does not require that such display systems be used in aircraft cockpits. *Id*. Therefore, the court has determined that UCHIDA and STOLOV, as displays that may be used in aircraft cockpits, are analogous prior art.

3. The REETZ THESIS Reference Is Not Prior Art.

Sections 102(a) and (b) of the Patent Act precludes issuance of a patent if:

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States[.]

35 U.S.C. § 102(a), (b).

The party claiming prior art must show by clear and convincing evidence that the invention at issue existed prior to the date of the patent application in the United States. *See In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986) ("The proponent of the publication bar must show that prior to the critical date the reference was sufficiently accessible[.]") (citations omitted); *see also Norian Corp*. v. *Stryker Corp*., 363 F.3d 1321, 1330 (Fed. Cir. 2004) (affirming a trial court's determination

that "there was not clear and convincing evidence that the Abstract was actually available at the IADR meeting.") (citations omitted). Accordingly, the court must make the prior art determination on a case-by-case basis. *See In re Hall*, 781 F.2d at 899 ("The § 102 publication bar is a legal determination based on underlying fact issues[.]").

In this case, the Government and Defendant-Intervenors argue that the United States Court of Appeals for the Federal Circuit requires only "competent evidence of the general library practice . . . to establish an approximate time when a thesis [becomes] available." *See* Gov't Def Reply at 29 (citing *In re Hall*, 781 F.2d at 899); *see also* L-3 PT Def at 15 n.8 ("Evidence of the typical procedures for indexing theses in the library where the particular reference was found is sufficient to establish a date of public availability.") (citing *In re Hall*, 781 F.2d at 899). The Government and Defendant-Intervenors concede that no evidence establishes the actual date of shelving and indexing of the REETZ THESIS. *See* Gov't PT Def at 11 ("Though information as to the actual date of shelving and indexing of the thesis was requested from Penn State, the library was unable to furnish this information."). Therefore, the Government and Defendant-Intervenors rely on the testimony of Mr. Reetz, Dr. Fidishun,[12] and Ms. Wiant[13] to establish the public availability of the REETZ THESIS. *See* Gov't Def Reply at 29-30. At trial, it was established that the REETZ THESIS was signed on July 5, 1983, by the Assistant Dean of the Penn State Graduate School. *See* DE 670 at PS-0042. It was also established that it was library practice to catalog and shelve a masters thesis within three months after being signed. *See* Gov't PT Def at 12 (citing DE 668 at 26-28, 41-43 (Fidishun) (testifying that a thesis would be cataloged and shelved "usually . . . within a month, month and a half at the most, I would say outside three months[.]")); *see also* DE 688 at 23 (Wiant) ("The longest it would take would be a month."). In addition, it was established that bindings and markings on the REETZ THESIS were consistent with bindings and markings on other masters theses from 1983 to 1985. *See* Gov't PT Def at 12 (citing DE 688 at 15-16, 30-31, 40-41). Therefore, the Government argues this collective testimony established that the REETZ THESIS would have been cataloged and shelved no later than October 1983. *Id.* at 11-13 ("[T]he Reetz [M]asters [T]hesis would have been shelved and cataloged in the satellite Penn State Library no later than October 1983.").

Honeywell counters that the documentary evidence establishes that the REETZ THESIS first was cataloged on November 5, 1985, because in 1983, the Penn State Great Valley Library used a computerized library catalog system, called the Library Information Access System ("LIAS"), that used machine-readable cataloging records ("MARC records"). *See* Pl PT Op Def at 110 (citing DE

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[12] Dr. Fidishun is the Head Librarian at the Great Valley School of Graduate Professional Studies and a tenured faculty member at the Penn State University library system. *See* DE 668 at 5 (Fidishun).

[13] Ms. Wiant worked as a Library Assistant at the King of Prussia Graduate Center (now the Great Valley School of Graduate Professional Studies) from September 1964 to June 2004. *See* DE 688 at 8, 11 (Wiant).

668 at 50-51, 142-43, 150-51 (Fidishun); DE 679 (Carson Article) (discussing instillation of LIAS); DE 684 (Academic Computing Newsletter)). Dr. Fidishun also testified that the earliest record of the REETZ THESIS being cataloged and shelved in the library was November 5, 1985:

DR. FIDISHUN:	No. [DF-18 is] the MARC record for the Reetz thesis.
HONEYWELL COUNSEL:	You would agree with me . . . that this MARC record was created 851105?
DR. FIDISHUN:	Right.
HONEYWELL COUNSEL:	So that's 1985 November 5 –
DR. FIDISHUN:	Right.
	* * *
HONEYWELL COUNSEL:	And that date, November 05, '85, is the earliest date that there's any documentary record anywhere at Penn State that this existed?
DR. FIDISHUN:	Yeah. I mean –
HONEYWELL COUNSEL:	Not even on the shelf but just flat-out existed?
DR. FIDISHUN:	As far as I can see, yeah. I haven't seen anything listed to indicate otherwise.

DE 668 at 193-94.

For these reasons, the court has determined that Honeywell established that the November 5, 1985 MARC date is consistent with the check-out card that was first stamped on November 7, 1985. *See* Pl PT Op Def at 111 (citing DE 688 at 36 (establishing that the first date stamped on the card was November 7, 1985)). Neither Dr. Fidishun nor Ms. Wiant had any personal knowledge about the REETZ THESIS. *Id*. at 112-13; *see also* DE 668 at 195-96 (Fidishun) (HONEYWELL COUNSEL: "Again, you have no personal knowledge about what happened in 1983, '84, '85; isn't that so?" DR. FIDISHUN: "That's true. I'm just saying from what I heard and what I was told."); *see also* DE 688 at 104-5 (Wiant) (admitting that she had no personal knowledge about the shelving of the REETZ THESIS).

Honeywell further argues that the Government and Defendant-Intervenors have not presented any evidence as to when the REETZ THESIS was provided to the library. *See* Pl PT Op Def at 116 ("The Government introduced no testimony from Mr. Reetz, his advisors, the engineering

department or anyone else [to demonstrate when the library received the thesis]."); *see also* DE 688 at 105 (Wiant) (HONEYWELL COUNSEL: "To say it probably was, you're assuming that [the REETZ THESIS] was provided by the office-" MS. WIANT: "Exactly[.]" HONEYWELL COUNSEL: "– administration office?" MS. WIANT: "Right."). Therefore, even though the Government established that library practice was to catalog and shelve a thesis within one month after it was received, this is not determinative of when the REETZ THESIS was received. *See* Pl PT Op Def at 116 ("Here, without a shred of evidence regarding when the [REETZ THESIS] was provided to the library, there is no starting point from which to apply such estimates.").

The court agrees that "competent evidence of the general library practice" may be used to "establish an approximate time when a thesis became available." *In re Hall*, 781 F.2d at 898-99 ("The Library copies of the Foldi dissertation were sent to us by the faculty on November 4, 1977. Accordingly, the dissertation most probably was available for general use toward the beginning of the month of December, 1977."). In this case, however, the evidence proffered by the Government and Defendant-Intervenors did not establish when the REETZ THESIS was provided to the Great Valley Library. *Id.* Therefore, even if the Government and Defendant-Intervenors established by clear and convincing evidence that the REETZ THESIS was cataloged and shelved within three months after being sent to the Great Valley Library, no evidence was adduced to establish the date of receipt that triggered the three-month calculation. In addition, the Government and Defendant-Intervenors have not established by clear and convincing evidence any practice regarding the delivery or availability, either in general or specific to the REETZ THESIS. *See* Gov't PT Def at 10-13; *see also* Gov't Def Reply at 28-32; L-3 PT Def at 15 n.8; L-3 Def Reply at 9 n.6. Dr. Fidishun's testimony as to when a thesis would be received by the library solely was based on hearsay:

> Basically, what happens is this. And it has been the same as long as anybody knows, *from everything I've been told.* The student completes the thesis, and at whatever date they complete the thesis, their advisor and/or department head signs off on the thesis. At that point [the students] bring right now usually just one copy [to the library].

DE 668 at 22 (Fidishun) (emphasis added).

Ms. Wiant, however, testified:

GOVERNMENT COUNSEL:	A student would bring in a copy of his or her thesis to the library?
MS. WIANT:	No. The thesis would be handed in and it would be signed by the faculty member who was the advisor, and they had been cleared for graduation, that all their course work and

> everything was completed. Then the thesis would be brought down to the library to be cataloged and shelved.

DE 686 at 12 (Wiant); *see also* DE 689 (Wiant Affidavit) ("After a [student's] thesis was approved by the student's adviser(s), the thesis was submitted to the University's library[.]").

Ms. Wiant's testimony, however, established only that the student's Advisor or a member of the Advisor's staff typically submitted the student's thesis to the library, which conflicts with Dr. Fidishun's testimony as to when the library would receive a thesis for cataloging and shelving in the 1980s. Based on this inconsistency and the lack of any definitive evidence regarding when the REETZ THESIS actually was received by the Great Valley Library, the court has determined that the Government and Defendant-Intervenors did not establish by clear and convincing evidence that the REETZ THESIS was available to the public before October 10, 1985.

This case is distinct from *In re Hall*, where the opposing party did not proffer any evidence to rebut the applicant's use of general library practices. *See In re Hall*, 781 F.2d at 899 ("Moreover, it is undisputed that appellant proffered no rebuttal evidence."). In this case, Dr. Fidishun admitted that the first documented evidence of the REETZ THESIS being publically available was not until November 5, 1985. *See* DE 668 at 194-95 (Fidishun); *see also* DE 688 at 36 (Wiant) (confirming the first date stamped on the check-out card was November 7, 1985). Therefore, the Government and Defendant-Intervenors' reliance on general library practices does not establish by clear and convincing evidence the public availability of the REETZ THESIS.

Because the Government and Defendant-Intervenors have not established that the REETZ THESIS was publically available before October 10, 1985, as a matter of law, it cannot be considered prior art. *See* 35 U.S.C. § 102; *see also* DMX 36 at D000001 ('269 Application filed October 10, 1985).

C. Defenses Asserted By The Government And Defendant-Intervenors.

1. Validity.

Section 282 of the Patent Act states that:

> *A patent shall be presumed valid. Each claim of a patent* (whether in independent, dependent, or multiple dependent form) *shall be presumed valid* independently of the validity of other claims; dependent or multiple dependent claims shall be presumed

> valid even though dependent upon an invalid claim. . . . The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.

35 U.S.C. § 282 (emphasis added).[14]

Accordingly, the United States Court of Appeals for the Federal Circuit has held that the defendant bears the burden of demonstrating invalidity by clear and convincing evidence. *See Norian Corp*, 363 F.3d at 1326 ("The jury was correctly instructed that a party seeking to invalidate a patent must do so by clear and convincing evidence.") (citation omitted); *see also AK Steel Corp.* v. *Sollac & Ugine*, 344 F.3d 1234, 1238-39 (Fed. Cir. 2003) (citations omitted) ("[B]ecause a patent is presumed to be valid . . . the evidentiary burden to show facts supporting a conclusion of invalidity is one of clear and convincing evidence.").

The Government and Defendant-Intervenors acknowledge that the clear and convincing standard applies, but argue that "the presumption of validity *may be diminished* when it appears the Patent and Trademark Office [("PTO")] *failed to . . . review the patent and the prior art*." L-3 PT Def at 52 (emphasis added); *see also* Gov't PT Def at 15-16 (re: same).

In *KSR,* the United States Supreme Court, however, did not directly address whether the presumption of validity may be affected when all relevant prior art was not considered by the Patent Examiner. *See KSR*, 127 S. Ct. at 1745 ("We need not reach the question whether the failure to disclose [prior art] during the prosecution of [the patent at issue] voids the presumption of validity given to issued patents, for [the] claim . . . is obvious despite the presumption."). Therefore, clear and convincing evidence remains the governing evidentiary standard for conducting an obviousness inquiry. *Id.*; *see also Lindemann Maschinenfabrik GMBH* v. *American Hoist and Derrick Co.,* 730 F.2d 1452, 1459 (Fed. Cir. 1984) ("*Lindemann*") ("Because the mere introduction of non-considered art (a common phenomenon) does not 'weaken' or otherwise affect the presumption, there is no basis for adjusting the required level of proof downward to a 'mere preponderance.'"); *Solder Removal Co.* v. *U.S. Int'l. Trade Comm'n*, 582 F.2d 628, 632 (CCPA 1978) ("The ALJ's conclusion, that the statutory presumption of validity . . . does not exist when the most pertinent prior art was neither presented to nor considered by the PTO, is unsound.").

Nevertheless, the Patent Examiner's review of the prior art is relevant, because the clear and convincing standard may be more easily met when prior art was not considered. *See Lindemann*, 730

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[14] This presumption has been discussed by federal courts "in connection with the nonobviousness condition for patentability[.]" CHISUM ON PATENTS § 19.02, 19-10 (2007) (citation omitted). The presumption of validity, however, "is applicable to all of the many bases for challenging a patent's validity." *Panduit Corp*. v. *Dennison Mfg. Co.*, 810 F.2d 1561, 1570 (Fed. Cir. 1987) ("*Dennison*"). Such "bases" include: utility; definiteness; enablement; best mode; written description; anticipation; and obviousness. *See* Alan L. Durham, PATENT LAW ESSENTIALS 67-126 (2d ed. 2004).

F.2d at 1459 ("[T]he clear and convincing standard may more easily be met when such non-considered art is more pertinent than the cited art[.]") (citations omitted); *see also Solder Removal Co.*, 582 F.2d at 632 ("[R]ebuttal of the presumption of patent validity may be more easily and more often achieved in reliance on prior art more pertinent than that considered by the examiner[.]").

In this case, the Government and Defendant-Intervenors contend that the following prior art[15] was never presented to the Patent Examiner: GERMAN PATENT (DE 505);[16] TRIMMIER (DE 514); UCHIDA (DE 515); and STOLOV (DE 519). *See* L-3 PT Def at 52-53; *see also* Gov't PT Def at 10. The Government and Defendant-Intervenors also contend that the Patent Examiner accorded the prior art only a "cursory review." *See* L-3 PT Def at 53; *see also* Gov't PT Def at 16 (arguing that the examiner reviewed over 100 pages of prior art in less than an afternoon). In addition, L-3 argues that the Patent Examiner analyzed the '914 patent under the more rigid "Teaching, Suggestion, or Motivation" ("TSM") test rejected by *KSR*. *See* L-3 PT Reply at 50 ("As evidence of *KSR*'s importance, the Patent and Trademark Office has issued new regulations for examiners to evaluate obviousness in patent applications.").

Honeywell does not dispute that TRIMMIER, UCHIDA, and STOLOV were not considered by the Patent Examiner. *See* Pl PT Op Def at 92-93. Honeywell also does not dispute that the English translation of the GERMAN PATENT was not considered by the Patent Examiner. *Id*. at 93 (citing DE 504). Honeywell insists, however, that the Patent Examiner reviewed the most pertinent prior art concerning complementary filtering and full color displays. *Id.* at 92 (stating that BOEHM, TASK & GRIFFIN III, BREITMAIER & REETZ, and the GERMAN PATENT, regarding complementary filtering, were disclosed to the Patent Examiner); *see also id.* at 93 (stating that DMX 4 and DE 146, disclosing full color displays also were presented to the Patent Examiner). Therefore, the Patent Examiner gave full consideration to the prior art. *Id.* at 94 (citing DMX-38 at D001534 (PTO Form 1449)) ("Examiner Buczinski represented that he considered that prior art on three separate occasions: on January 16, 2002 and January 24, 2002 during prosecution of the '760 application and again on June 25, 2002 during prosecution of the '269 application."); *see also id.* at D001705; DMX-36 at D000521, DE-1558 (PTO Form 1449).

The only version of the GERMAN PATENT provided to the PTO was not translated into English. *See* DMX 36 at D000376-387 (including DE 504). The United States Court of Appeals for the Federal Circuit has not held directly whether untranslated foreign prior art is disclosed to the Patent Examiner. A partially untranslated prior art reference, when translated, however, "would have provided a 'good blueprint' for making the exact device described by the [patent-in-suit]." *See*

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[15] A complete list of all the relevant prior art in this case is set forth herein. *See* Section II.B. 1, 2.

[16] L-3 clarifies that the German language version of the GERMAN PATENT (DE 504) was presented to the Patent Examiner, but no English translation was provided, so that the GERMAN PATENT in effect was undisclosed. *See* L-3 PT Reply at 50.

Semiconductor Energy Lab. Co., v. *Samsung Elecs. Co.*, 204 F.3d 1368, 1374 (Fed. Cir. 2000) (together with other prior art, the "[translated] Canon reference would have rendered obvious the asserted claims of the [patent-in-suit]."). There is no evidence in this record that the Patent Examiner otherwise considered a translated version of the GERMAN PATENT. *See* DMX 36 (including only DE 504 in German). Therefore, the court has determined that the GERMAN PATENT was not properly disclosed as prior art. As our appellate court has observed, "[a] withheld reference may be highly material when it discloses a more complete combination of relevant features, even if those features are before the patent examiner in other references." *See Semiconductor Energy Lab. Co.*, 204 F.3d at 1374 (citation omitted). Therefore, even though Honeywell may have disclosed other prior art that demonstrates similar concepts, the GERMAN PATENT would have provided the Patent Examiner with a "more complete combination of the relevant features." *Id.* The court acknowledges the logic in the Government's argument that, because the Patent Examiner reviewed the '914 patent under the TSM test, the presumption of validity should be afforded less weight in light of *KSR*. The Government and Defendant-Intervenors, however, have not cited any case law to support changing this established presumption. Moreover, the United States Supreme Court has concluded that the TSM test provides "helpful insight;" it was only the "rigid and mandatory" application of the TSM test that was rejected. *See KSR*, 127 S. Ct. at 1731. Accordingly, the court declines to afford the presumption of validity any lesser weight in this case. The ultimate validity determination of claims of the '914 patent, however, requires a complete analysis of other asserted defenses.

2. Anticipation.

> Section 102 of the Patent Act states that a patent is invalid for lack of novelty if:
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States[.]

35 U.S.C. § 102(a), (b).

To anticipate a claim, a single prior art reference must: include each and every element of the claimed invention; enable; and describe the claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of invention. *See Helifix Ltd.* v. *Blok-Lok, Ltd.,* 208 F.3d 1339, 1346 (2000) (quoting *In re Paulson*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994)). Analogous elements in a reference and references that are in close proximity to the claimed invention should not be considered by the court determining novelty. *See* MARTIN J. ADELMAN, CASES AND MATERIAL ON PATENT LAW 168 (2d ed. 2003) ("ADELMAN") ("[E]lements that are analogous to the disclosure of a reference [may not] be considered. . . . A prior art rejection may still occur based on

the proximity of a single piece of prior art to a claimed invention, but this inquiry is cast in terms of § 103 and nonobviousness.").

A claimed element that is not explicitly disclosed in prior art may be found, if it is inherently disclosed. *See Continental Can Co. USA* v. *Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991) (holding that a prior art reference inherently anticipates when "missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill."). In *Schering Corp.* v. *Geneva Pharms., Inc.,* 339 F.3d 1373, 1377 (Fed. Cir. 2003), however, the United States Court of Appeals for the Federal Circuit clarified that "*Continental Can* does not stand for the proposition that an inherent feature of a prior art reference must be perceived as such by a person of ordinary skill in the art before the critical date." Therefore, subject matter may be inherently disclosed by analyzing the prior art through the eyes of one of ordinary skill in the art and considering other evidence about the meaning of the prior art. *Id.* at 1377-78 ("Read in context, *Continental Can* stands for the proposition that inherency, like anticipation itself, requires a determination of the meaning of the prior art. Thus, a court may consult artisans of ordinary skill to ascertain their understanding about subject matter disclosed by the prior art, including features inherent in the prior art. A court may resolve factual questions about the subject matter in the prior art by examining the reference through the eyes of a person of ordinary skill in art, among other sources of evidence about the meaning of the prior art. Thus, in *Continental Can*, this court did not require past recognition of the inherent feature, but only allowed recourse to opinions of skilled artisans to determine the scope of the prior art reference.").

Accordingly, a limitation is not inherently disclosed, if there is only a mere possibility or probability that it is inherent in the reference. *See In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981) ("Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. . . . If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.").

Anticipation analysis entails two steps: claim construction and a comparison of the construed claims against the prior art reference. *See Key Pharms.* v. *Hercon Labs. Corp.*, 161 F.3d 709, 714 (Fed. Cir. 1998) ("[N]ot unlike a determination of infringement, a determination of anticipation . . . involves two steps. First is construing the claim, a question of law for the court, followed by, in the case of anticipation or obviousness, a comparison of the construed claim to the prior art."). Anticipating a claim in prior art is a finding of fact. *See Titanium Metals Corp.* v. *Banner*, 778 F.2d 775, 780 (Fed. Cir. 1985) ("We have held that anticipation is a finding of fact, reviewable under the 'clearly erroneous' standard[.]").

a. Claim Construction.

In this case, claim 2 of the '914 patent describes:

> A display system for use in association with a light amplifying passive night vision aid and a local color display including a local source of light having blue, red, and green color bands,[17] comprising:
> (a) a plurality of filters at the local color display including (1) a first filter for filtering the blue color band of the local source of light; (2) a second filter for filtering the green color band of the local source of light; and (3) a third filter for filtering the red color band of the local source of light and passing a narrowband of the red color band; and
> (b) a fourth filter which filters light at the night vision aid, said fourth filter cooperating with said plurality of filters to substantially block at least said narrowband of the red color band from being admitted to the night vision aid.

DMX 36 at DE 1688 ('914 patent, col. 6, ll. 12-28).

Following a *Markman* proceeding, claims requested by the parties were construed by the court, as follows:

"display system"	"A system comprised of optical filters that can be used in combination with an aid, with light amplifying, passive, and night vision qualities, and a display of colors that includes a source of light perceptible by the night vision aid." *Honeywell II*, 66 Fed. Cl. at 437.
"local color display"	"A device that may be used together or in combination with optical filters and shows or exhibits at least one color perceptible to an observer or observers utilizing a night vision aid." *Honeywell II*, 66 Fed. Cl. at 444.
"local source of light"	"An essential element of the local color display that must be perceptible to an observer or observers with a night vision aid." *Honeywell II*, 66 Fed. Cl. at 447.
"filters light from the local color display"	The starting point for filtering light occurs at the filters. *Honeywell II*, 66 Fed. Cl. at 453.

[17] The court has previously determined that the preamble is "necessary to understanding the *'914 patent* and therefore as a limitation thereof." *Honeywell II*, 66 Fed. Cl. at 436 (citation omitted) (emphasis in original).

"notch filter"	An optical filter that has the capacity both to pass and substantially block light and may be a single-notch filter or a multi-notch filter. *Honeywell II*, 66 Fed. Cl. at 459.
"color bands" in claim 2(a)	To include the range of wavelengths, within which the colors blue, red, and green are visible to the human eye. *Honeywell II*, 66 Fed. Cl. at 466.
"red color band"	A range of color from 620 nm to 780 nm. *Honeywell II*, 66 Fed. Cl. at 471.
"substantially blocks"	Claim 2(b): Preventing light from the narrowband of the red color band from entering the night vision aid in an amount that permits the night vision aid to function. *Honeywell III,* 70 Fed. Cl. at 468.
"first," "second," "third," "fourth," and "filter"	Identifies the various members of a group. *Honeywell II*, 66 Fed. Cl. at 482.
"blue color band"	A range of color from 455 nm to 492 nm. *Honeywell II*, 66 Fed. Cl. at 485.
"green color band"	A range of color from 492 nm to 577 nm. *Honeywell II*, 66 Fed. Cl. at 487.

In addition, the construction of the following claims was the subject of a stipulation by the parties:

"optical filter" and "filter"	"[W]hen used as nouns in the claims of the '914 patent, mean 'a device that selectively passes and blocks electromagnetic radiation.' . . . '[F]ilters' (plural), when used as a noun, means two or more filters." *Honeywell II*, 66 Fed. Cl. at 448.
"filter" and "filtering"	"[W]hen used as verbs in the claims of the '914 patent, mean 'selectively to allow (or allowing) light to pass and be blocked.'" *Honeywell II*, 66 Fed. Cl. at 448.
"passes"	"[M]eans 'allows to go through.'" *Honeywell II*, 66 Fed. Cl. at 459.

"predetermined color bands"	"[A]s used in [c]laim 1(a) of the '914 patent, requires no further construction aside from the term 'color band.'" *Honeywell II*, 66 Fed. Cl. at 466.
"predetermined red color band"	"'[A] specific range of wavelengths within the red color band.'" *Honeywell II*, 66 Fed. Cl. at 472.
"narrowband of the red color band"	"[M]eans 'a narrow range of wavelengths within the red color band.'" *Honeywell II*, 66 Fed. Cl. at 487.

b. Comparison Of The Construed Claims Against The Prior Art.

The Government argues that two references anticipate the '914 patent. *See* Gov't PT Def at 51-53 (citing *Pave Low III: Interior Lighting Reconfiguration for Night Lighting and Night Vision Goggle Compatibility*, H.L. Task & L.L. Griffin, Human Engineering Division, Aerospace Medical Research Laboratory, Wright-Patterson, AFB, Ohio at 106-16 ("TASK & GRIFFIN III") (DE 508) and *Shared Aperature Filter Technique for Use with AN/PVS-5A Night Vision Goggles*, F. Reetz III, Masters Thesis, The Pennsylvania State University, The Graduate School, August 1983 ("REETZ THESIS") (DE 301).[18]

i. "A display system"

Dr. Task testified that TASK & GRIFFIN III discloses: a system of optical filters, with a red plastic filter placed over the NVGs; a Micro-Louvre baffle, employed over an incandescent lamp illuminated by a moving map display; and a Glendale Green filter applied to the display. *See* DE 500 ¶ 187; *see also* DE 508 at DE-1615, DE-1617, DE-1618. The Government contends that the moving map display is the "display of colors," discussed in the court's claim construction. *See* DE 500 ¶ 104 ("Indeed, the moving map display in the Pave Low III was a full color display using straight through optical projection of a 35 mm filmstrip of selected aeronautical charts.").

Honeywell responds that TASK & GRIFFIN III does not disclose a "display system," because it does not feature a "display of colors," as required by the court's claim construction. *See* Pl PT Op Def at 103. Honeywell first contends that the moving map display would be understood by one of ordinary skill in the art, in 1985, to be a projector that could be used with various transparent films containing maps. *Id.* (citing PTX 834 ¶ 19 (Tannas)); *see also* TR 683 (Task) ("[The moving map display] uses an incandescent light source in the display . . . and then it illuminates or goes right through a slidex or a transparency film, much like a 35 millimeter slide projector."). The film, however, should not be considered part of the display. *See* Pl PT Op Def at 103-04 (citing PTX 834

[18] The court has determined that the REETZ THESIS is not prior art.

¶ 20 (Tannas)); *see also* PTX 833 ¶ 99 (Lawrence) ("[M]oving map displays all required insertion of a film or cartridge that would contain the map or maps used in the display[.]"); TR 704 (Task) (HONEYWELL COUNSEL: "[T]he film isn't part of the device, right? It's no more part of the device than my VHS tape is for my VCR, right?" DR. TASK: "I guess you could consider it that way, although without that critical component, that would just be a yellow light[.]"). In addition, Honeywell argues that the film for the moving map display should not necessarily be construed to be a color film. *See* Pl PT Op Def at 104 (citing PTX 834 ¶¶ 21-26 (Tannas)); *see also* PTX 833 ¶ 99 (Lawrence) ("[M]aps were sometimes in color and sometimes in black and white."); TR 687-88 (Task) (HONEYWELL COUNSEL: "Is there anything in the article itself that anywhere refers to the moving map display as being color?" DR. TASK: "No, I'm relying on one of ordinary skill in the art to know that moving map display would be a film based system, and that for that aircraft would be a color moving map display.").

The court's construction of "a display system" requires a "display of colors." *Honeywell II*, 66 Fed. Cl. at 437. This element would only be present in TASK & GRIFFIN III if the moving map displayed a color map projection. Therefore, the court has determined that the moving map display, described in TASK & GRIFFIN III, does not anticipate the court's construction of "display system" in claim 2 of the '914 patent and this element is not disclosed in the prior art.

The moving map display is mentioned only three times in TASK & GRIFFIN III, in the context of lessening the impact of cockpit incandescent light on the operation of NVGs. *See, e.g.,* DE 508 at DE-1616 ("It is not possible to turn off all incandescent lights in the cockpit since some are required instrument status lights."); *see also* DE-1617 ("T[he] technique of using ML baffles was successfully employed over several indicator lamps and displays including the incandescent lamp illuminated moving map display located in the center console."); DE-1618-19 ("[T]he moving map (navigation) display was marginally acceptable in daytime when sufficient IRBM was applied to block the IR emissions for night use."). In addition, neither the use of a particular film cartridge nor the effect of the colors from the color map projection is mentioned in TASK & GRIFFIN III. *See* DE 508. Dr. Task also testified that the main problem with making NVGs compatible with cockpit lighting was interference caused by incandescent lights. *See* DE 500 ¶ 36 ("Light from instruments and displays and general cockpit lighting can enter the NVGs thereby interfering with the pilot's view of the outside scene. This interference was caused primarily by the fact that traditional cockpit lighting used incandescent lamps with red filters to light most of the instruments and panels in the cockpit.").

Likewise, Final Report: Pave Low III Prototype Development Test and Evaluation ("PAVE LOW III")[19], describes the moving map display as "consist[ing] of a display unit which houses the 35mm filmstrip cassette, lamp, optics, and controls; a signal data converter; and a step-down transformer." DE 527 at GVT011-4526. Filmstrips used in this system feature: "35mm color reproductions of selected aeronautical charts[.]" *Id.*; *see also* DE 500 ¶ 104 (Task) ("That the

[19] PAVE LOW III is a technical report on the Pave Low III helicopter prepared by the Defense Technical Information Center.

moving map display was known as a 'full color display' is supported by the fact that it was referenced as one in a March 1978 technical report[.]"). Col. Lawrence and Mr. Tannas, however, testified that both black and white and color maps were used in moving map displays. *See* PTX 834 ¶¶ 21-26 (Tannas); PTX 833 ¶ 99 (Lawrence). Mr. Tannas further testified that PAVE LOW III would not necessarily be available to one of ordinary skill in the art, in 1985, as it was a Government document. *See* PTX 834 ¶ 26. The court has determined that one of ordinary skill in the art, in 1985, however, would be knowledgeable about "night vision compatible aids, compatible instrument and panel lighting, and manufacturing displays for *military* cockpits." *Honeywell II*, 66 Fed. Cl. at 428 (emphasis added). Therefore, it is reasonable to assume such individuals would have had access to a specification like PAVE LOW III.

To anticipate inherency, the reference must necessarily disclose the unstated function of the element. *See Atofina* v. *Great Lakes Chem. Corp.*, 441 F.3d 991, 1000 (Fed. Cir. 2006); *see also In re Oelrich*, 666 F.2d at 581 ("If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in *the performance of the questioned function*, it seems to be well settled that the disclosure should be regarded as sufficient.") (emphasis added); *Parker* v. *Ballantine,* 26 C.C.P.A. 799, 803 (1939) ("Possibly in the operation of the Parker device, at some point on the more nearly linear portion of the characteristic curve of the tube, it might actually happen that there would be slight reduction of amplification, but it is apparent that this would not necessarily be the result."). Although the PAVE LOW III describes using color film in the moving map display, other testimony in the record indicates that black and white film might also have been used. *See* PTX 834 ¶¶ 21-27 (Tannas); PTX 833 ¶ 99 (Lawrence). The fact that the filter system described in TASK & GRIFFIN III would function the same, regardless of whether color or black and white film was used or if no film was inserted into the moving map display, implies that the film was not *necessarily* present. Because "inherency. . . may not be established by probabilities or possibilities," the court has determined that the Government has failed to prove by clear and convincing evidence that color film necessarily was disclosed, nor that any "display of colors" was disclosed by TASK & GRIFFIN III. *See MEHL/Biophile Int'l Corp.* v. *Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999) ("Inherency, however, may not be established by probabilities or possibilities.").

ii. "for use in association with a light amplifying passive night vision aid"

The Government argues that TASK & GRIFFIN III, "Pave Low III Interior Lighting Reconfiguration for Night Lighting and Night Vision Goggle Compatibility," and several explicit references pertaining to the use of NVGs, together disclose the use of night vision goggles. *See* DE 508 at DE-1610-12; Gov't PT Def at 51-52. Honeywell does not dispute that TASK & GRIFFIN III discloses this element, but challenges the Government's satisfaction of the burden of proof. *See* Pl Op Def at 108-09. The court, however, has determined that the Government and Defendant-Intervenors established that the prior art discloses "for use in association with a light amplifying passive night vision aid" by clear and convincing evidence.

iii. "and a local color display"

The Government argues that the moving map display in TASK & GRIFFIN III is a local color display, as construed by the court. *See* Gov't PT Def at 51-52 (citing DE 500 ¶ 187 (Task) ("A local color display capable of producing at least one perceptible color was disclosed: '. . . successfully employed over . . . displays including the incandescent lamp illuminated moving map display[.]' (D000580, lines 9-11). One of ordinary skill in the art, being knowledgeable in the manufacturing of displays for military aircraft, would . . . know that the moving map display in this aircraft was a full color display.")). In addition, the Government contends that the type of goggles disclosed by the reference is inconsequential to whether an observer utilizing a night vision aid can perceive at least one color from the display. *See* Gov't Def Reply at 27 ("[I]t is unclear why Honeywell believes that the display itself changes depending on the goggle set used with it. A display that 'shows or exhibits at least one color perceptible to an observer or observers utilizing a night vision aid' would 'show or exhibit' the same colors no matter what goggles are being worn by the pilot.").

Honeywell responds that TASK & GRIFFIN III does not disclose "a local color display," because the reference discloses AN/PVS-5 NVGs that do not allow the wearer to see the colors of the display. *See* Pl PT Op Def at 105 (citing PTX 834 ¶¶ 30-42 (Tannas)); *see also* TR 699-700 (Task).

The court has determined that the moving map display described in TASK & GRIFFIN III does not satisfy the court's construction of a "local color display" and therefore this claim element is not disclosed by this prior art. The court's claim construction requires that a "local color display" be "[a] device that may be used together or in combination with optical filters and shows or exhibits at least one color perceptible to an observer[.]" *Honeywell II,* 66 Fed. Cl. at 444. The court did not require that display to be "a full color display that is NVG compatible," contrary to Honeywell's contention. *See* Pl PT Op Def at 18-19 ("[T]he problem addressed by the invention was 'placing a full color display in a cockpit.'"). Dr. Tannas testified that a user of the goggles described in TASK & GRIFFIN III would not be able to see the colors that could be seen by looking directly at the moving map display. *See* PTX 834 ¶ 36 (Tannas) ("[I]f the user of the AN/PVS-5 night vision goggles described in [TASK & GRIFFIN] were to look at the instrument panel through the goggles, he would not see any colors that could be seen by looking directly at the instruments, but would instead see a monochrome green image of the instrument panel on a phosphor screen that is part of the NVGs."); *see also* TR 1431-32 (Tannas) (HONEYWELL COUNSEL: "So if the display is a full color display with red, green, and blue primaries, but it is being used with PVS-5 night-vision goggles, is that a local color display that satisfies the Court's claim construction?" MR TANNAS: "No. You would not be able to see no matter how you configured it . . . [y]ou could not see color, period. . . it says a local color display is supposed to see at least one perceptible color. Well, presumably it is a color that the display . . . has, not green in the goggle, even one color. It doesn't even pass the test of one color."). Therefore, whether a 'local color display' is disclosed by TASK & GRIFFIN III depends on what kind of goggles are disclosed.

TASK & GRIFFIN III discloses AN/PVS-5 night vision goggles. *See* DE 508 at D000574 ("Figure 3 shows a pair of the AN/PVS-5 night vision goggles."). Therefore, as Dr. Task testified:

> HONEYWELL COUNSEL: Now, once again, this article deals with the old-style goggles that you cannot look underneath, isn't that right?
>
> DR. TASK: It's the old-style goggles which makes it difficult for you to look underneath.
>
> HONEYWELL COUNSEL: And they're not intended to look underneath?
>
> DR. TASK: They're not designed for that, that's correct.
>
> HONEYWELL COUNSEL: And that's what's disclosed in the article . . . for its purposes and its analyses, right?
>
> DR. TASK: That is correct.

TR 699-700.

Dr. Task and Col. Lawrence testified, however, that the AN/PVS-5 goggles could be modified by cutting away the full face mask. *See* TR 1590-91 (Task) ("In 1985 it was well known that you could do cut-aways on PVS-5 night-vision goggles or look under for night-vision goggles."); *see also* TR 996-98 (Lawrence) (same). TASK & GRIFFIN III does not explicitly disclose using cut-away PVS-5 goggles, so that the pilot wearing the NVGs can see the display; instead, that decision is left to the co-pilot. *See* DE 508 at D000757 ("The desired operating condition was for the pilot to wear the NVGs to fly the helicopter while observing the outside world, and for the copilot to monitor the FLIR video display and the aircraft instruments. Thus the fundamental problem was to design a means of lighting such that the copilot had sufficient light to monitor the cockpit instruments but insure that the lighting did not interfere with the pilot's NVGs."). To anticipate inherently, TASK & GRIFFIN III "must necessarily include the unstated limitation." *Atofina*, 441 F.3d at 1000. The assumption that the co-pilot does not have NVGs to read the displays evidences that cut-away PVS-5 goggles are not necessarily included, because TASK & GRIFFIN III does not contemplate having a NVG-wearing pilot read the displays while flying the helicopter. *See* TR 1590-91 (Task) ("[T]here is no question, both [TASK & GRIFFIN III and REETZ THESIS] used a full face mask PVS-5 goggle, but in both cases there had been sufficient light so that one not wearing the night-vision goggles would see [the displays]."). Because inherency may not be established by "probabilities or possibilities," the court has determined that cut-away PVS-5 goggles are not necessarily disclosed. Therefore, the court has determined that the Government has failed to establish by clear and convincing evidence that a "local color display" was disclosed by TASK & GRIFFIN III. *See MEHL/Biophile Int'l Corp*, 192 F.3d at 1365 (*quoting In re Oelrich*, 666 F.2d at 581) (internal quotations omitted).

iv. "including a local source of light having blue, red, and green color bands"

The moving map display in TASK & GRIFFIN III is illuminated by an incandescent lamp. *See* DE 508 at D000580 ("This technique of using [Micro-Louver] baffles was successfully employed over several indicator lamps and displays including the incandescent lamp illuminated moving map display located in the center console."). Therefore, the Government argues that "[o]ne skilled in the art would understand that an incandescent lamp emits light across the entire visible spectrum, including light in the wavelengths construed by the [c]ourt to be within the blue, red and green color bands." *See* Gov't PT Def at 51-52 (citing DE 500 ¶ 103 (Task)). Honeywell does not dispute that TASK & GRIFFIN III discloses this element. *See* Pl PT Op Def at 103-08. Therefore, the court has determined that the Government and Defendant-Intervenors established by clear and convincing evidence that TASK & GRIFFIN III discloses a "local source of light."

v. "a first filter for filtering the blue color band of the local source of light"

Dr. Task testified that "the film could be considered the first filter for filtering the blue color band since at least some blue wavelengths reach this filter." DE 500 ¶ 106. He further testified that "[a]lternatively, the portions of the film used to produce the moving map display that are blue in color could be considered to be the first filter for filtering the blue color band[.]" *Id.* at ¶ 108. Therefore, the Government argues that either the entire film within the moving map display or the portions of the film that are blue in color could be considered the first filter under the court's claim construction. *See* Gov't PT Def at 51 (citing DE 500 ¶¶ 100-23). In addition, the Government argues that the court's claim construction does not require the filters to be "wavelength selective filters." *See* Gov't Def Reply at 27-28.

Honeywell responded that Dr. Task's testimony is based on the mistaken assumption that the court's claim construction does not require wavelength selective filters. *See* Pl PT Op Def at 105-06. The film used in the moving map display cannot be considered the first filter, because the film is not part of the display and is not necessarily color film. *Id.* at 106 (citing PTX 834 ¶¶ 51-54, 58 (Tannas)).

The court has determined that the film in the moving map display is not disclosed by TASK & GRIFFIN III. Because the film is not disclosed, *ipso facto* it cannot serve as the first filter for filtering the blue color band of the local source of light. Assuming, *arguendo*, that the color film is disclosed by TASK & GRIFFIN III, nevertheless, the Government has failed to establish by clear and convincing evidence that either the whole film or the blue portions of the film constitute the "first filter." In addition, since the court has determined in the following section of this Memorandum Opinion that the Micro-Louver filter does not meet the court's construction for a second filter in claim 2(a)(2), the only remaining possible filter is the green portion of the film. This would make the color film both the first and second filters; however, this film is only one device and cannot also serve as two filters. *See* PTX 834 ¶¶ 76 - 77 ("The [c]ourt has defined 'filter' as a 'device,' and any

color film that would be used in the moving map display described in [TASK & GRIFFIN III] must be considered a single device, not two separate filters or devices. . . . Even if a single frame of color film happens to contain red features, blue features, and green features[,] these features are not separate and distinct filters like the red, green and blue pixel filters of an LCD display."). For this additional reason, the court has determined that the Government has failed to establish by clear and convincing evidence that "a first filter" is disclosed by TASK & GRIFFIN III.

vi. "a second filter for filtering the green color band of the local source of light"

Next, the Government argues that either the Micro-Louver filter or the green portions of the film in the moving map display could be considered the second filter under the court's claim construction. *See* Gov't PT Def at 51 (citing DE 500 ¶¶ 100-23). Dr. Task explained that a Micro Louver filter "acts like 'Venetian blinds,' [and] selectively passes and blocks light depending on its direction of emission from the display and is a filter." DE 500 ¶ 107. In the alternative, "the portions of the film that are green in color could be considered the second filter for filtering the green color band." *Id.* ¶ 108. The Government also argues that the court's claim construction does not require wavelength selective filters and that the filters may use another criterion for passing or blocking light. *See* Gov't Def Reply at 27-28.

Honeywell responds that the Micro-Louver filter cannot be considered the second filter, because it is not wavelength selective. *See* Pl PT Op Def at 106 (citing PTX 834 ¶¶ 62-73; TR 726 (Task) ("A micro-louvre is like a miniature venetian blind, . . . what it does is it allows light that is emitted in certain directions to be passed, mostly, and a light that goes in other directions are not passed[.]")). The film used in the moving map display cannot alternatively be considered the second filter, because the film is not part of the display and is not necessarily color. *See* Pl PT Op Def at 106 (citing PTX 834 ¶¶ 51-54, 58 (Tannas)).

TASK & GRIFFIN III describes the Micro-Louver as a material that comes in various fan widths and tilt angles and can be used to direct light away from the windscreen to control reflection. *See* DE 508 at D000579. The criteria for the Micro-Louver's filtering of light is therefore based on direction, not wavelength. The court construed the words "filter"or "filtering" when used as verbs to mean "'selectively to allow (or allowing) light to pass and be blocked.'" *Honeywell II*, 66 Fed. Cl. at 448. Reading the "filtering" and "green color band" definitions into the claim language yields "a second filter for selectively allowing a range of color from 492 nm to 577 nm of the local source of light to be passed and be blocked." Accordingly, the second filter is wavelength selective.

The Micro-Louver filter, however, is not wavelength selective. Therefore, any light that reaches it will be filtered directionally depending on the fan width and the tilt angle. *See* DE 508 at D000579 ("Thus a 48º fan at 0º tilt results in a light distribution that is emitted vertically (with respect to surface of material) with a 48º spread."). The court has discussed the reasons why the film of the moving map display is not disclosed as a filter. Therefore, the court has determined that the Government and Defendant-Intervenors failed to establish by clear and convincing evidence that a

second filter for filtering the green color of the local source of light is disclosed by TASK & GRIFFIN III.

vii. "a third filter for filtering the red color band of the local source of light and passing a narrowband of the red color band"

The Government also asserts that the Glendale Green filter that was placed over the moving map display is the third filter for filtering the red color band that passes a narrowband of the red color band. *See* Gov't PT Def at 51-52 (citing DE 500 ¶¶ 109-110, 187). Dr. Task presented two figures in his written direct testimony to show that the Glendale Green filter passes a narrowband of the red color band. *See* DE 500 ¶ 110. The Government also relies on a transmission curve for the Glendale Green filter from an article titled "Infrared Filter Materials" to show that the filter filters the red color band and passes a narrowband of the red color band. *See* DE 516 at LHM 000466.

Honeywell responds that there is no evidence that the Glendale Green filter passes perceptible red light from the red color band when placed over the moving map display in TASK & GRIFFIN III. *See* Pl PT Op Def at 106. TASK & GRIFFIN III only cites a lack of transmission spectrum for the Glendale Green filter. *Id.* Moreover, Dr. Task's calculations failed to account for the emission spectrum of the incandescent lamp, the transmission characteristics of the transparency film, and other components of the moving map display. *Id.* at 107 (citing PTX 834 ¶¶ 97-109).

The court has determined that TASK & GRIFFIN III does not disclose a third filter for filtering the red color band of the local source of light and passing a narrowband of the red color band. TASK & GRIFFIN III discloses using a Glendale Green filter in conjunction with a Micro-Louver filter to "provide fairly effective control of both visible and IR radiation" and describes that filter as having "a definite green tint and affect[ing] the red end of the visible [spectrum] much more severely than the green." DE 508 at D000580. TASK & GRIFFIN III does not disclose the transmission spectrum for the filter, nor the emission spectrum of the incandescent lamp in the moving map display. *See* TR 698 (Task) (HONEYWELL COUNSEL: "Now, the Glendale [G]reen, the article itself does not provide the transmission spectrum for that, does it?" DR. TASK. "That's correct. It does not have that perspective . . . " HONEYWELL COUNSEL: "Now, the article itself does not tell you what's coming out of the display in terms of the emission spectrum, is that right?" DR TASK: "That is correct."). The emission spectrum of the lamp is necessary to determine the amount of light emitted at a particular wavelength. *See* PTX 834 ¶ 103 ("The amount of light emitted by an incandescent light as a function of wavelength depends upon many different factors, including the color temperature of the lamp and the brightness setting of the moving map display[.]").

Moreover, the Glendale Green transmission spectrum described by Dr. Task relies on data from Figure 1 of DE 516. *Id.* ¶ 130 ("Task's spreadsheet identifies the source of the spectral data for the Glendale Green filter as 'Fig. 1 of Bartleson,' *i.e.,* Bertelson, DE-516."); *see also* PTX 827; DE 516 at LHM 000466. In contrast, the spectrum from DE 516 relied upon by Dr. Task has handwritten wavelength values and irregularly-spaced intervals on the x-axis. *See* DE 516 at LHM

000466; *see also* PTX 834 ¶ 135 ("The wavelength values (in nanometers) are handwritten and irregularly spaced, and it is unclear how they came to appear on the graph. To me, Figure 1 appears to be a laboratory scan generated to show the performance of the filter sample in a qualitative sense, not for the purpose of showing its spectral characteristics in any precise way."). It is unclear whether the transmission spectrum for the Glendale Green filter in DE 516 necessarily describes the Glendale Green filter disclosed in TASK & GRIFFIN III. The "Infrared Filter Materials" article states that "[t]he moving map (navigation) display was marginally acceptable in daytime when sufficient IRBM was applied to block the IR emissions for night use." DE 508 at D000581-82. The use of the phrase "sufficient IRBM," however, implies that there may have been more than one Glendale Green filter applied to the moving map display. *See* PTX 834 ¶ 132 ("The phrase 'sufficient IRBM' implies that more than one layer of Glendale Green filter material was placed over the moving map display."). The presence of more than one layer of Glendale Green filters would change the transmission of the filter. *Id.* ¶¶ 132-33 ("[T]he greater the thickness of an absorbing filter, the less its transmission. . . . [T]he transmission of the Glendale Green filter material would be substantially less, if multiple layers were used, as is implied by the phrase 'sufficient IRBM' in DE-508.").

Because it is not clear whether the transmission spectrum in DE 516 describes the Glendale Green filter used in DE 508, and because the "Infrared Filter Materials" article fails to disclose an emission spectrum for the incandescent lamp used in the moving map display, the court has determined that the Government and Defendant-Intervenors have not established by clear and convincing evidence that a third filter for filtering the red color band of the local source of light and passing a narrowband of the red color band is disclosed by TASK & GRIFFIN III.

viii. "a fourth filter which filters light at the night vision aid, said fourth filter cooperating with said plurality of filters to substantially block at least said narrowband of the red color band from being admitted to the night vision aid"

The Government argues that a red plastic filter placed over the NVGs in TASK & GRIFFIN III is the fourth filter which filters light at the night vision aid. *See* Gov't PT Def at 51-52 (citing DE 500 ¶¶ 111, 187). Dr. Task testified that this filter "blocked the offending light sufficiently to permit the NVGs to function as intended[.]" DE 500 ¶ 111. Because the NVGs functioned as intended, a fourth filter was disclosed. *See* Gov't Def Reply at 28 (citing the reasoning in the REETZ THESIS, as applicable to TASK & GRIFFIN III).

Honeywell responds that the transmission spectrum for the red filter shows that it did not substantially block light in the range of 620 nm to 780 nm. *See* Pl PT Op Def at 107 (citing PTX 834 ¶¶ 142, 147; DE 508 at D000578). Just because the NVGs functioned as normal does not mean that the red plastic filter substantially blocked the narrowband of red color from being admitted to the night vision aid. *Id.* (citing PTX 834 ¶ 148).

TASK & GRIFFIN III only discloses "a red plastic filter . . . placed over the NVGs that was also high transmissive in the near infra-red." DE 508 at D000578. Figure 8 of TASK & GRIFFIN III shows

a comparison of NVG sensitivity with and without this red filter. *Id.* The court's claim construction of "substantially blocks," however, requires the filter to prevent "light from the narrowband of the red color band from entering the night vision aid in an amount that permits the night vision aid to function." *Honeywell III*, 70 Fed. Cl. at 468. Therefore, the fourth filter must prevent some light from the narrowband of the red color band from entering the night vision aid, to allow the night vision aid to function. The fact that night vision aid was "functional" does not necessarily mean that the filter prevented any light from the narrowband of the red color band from entering the night vision aid. Although Figure 8 in TASK & GRIFFIN III shows that some light from the red color band is filtered by the red plastic filter, claim 2 requires that the light filtered be from the narrowband of the red color band passed by the third filter. Because TASK & GRIFFIN III does not disclose a third filter that passes a narrowband of the red color band, it also cannot disclose a fourth filter that substantially blocks the same narrowband of the red color band to allow the night vision aid to function. Therefore, the court has determined that the Government and Defendant-Intervenors have not established by clear and convincing evidence that "a fourth filter which filters light at the night vision aid, said fourth filter cooperating with said plurality of filters to substantially block at least said narrowband of the red color band from being admitted to the night vision aid" is disclosed by TASK & GRIFFIN III.

3. Obviousness.

a. Governing Precedent.

Section 103 of the Patent Act provides that prior art invalidates a patent for obviousness, when the:

> differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains.

35 U.S.C. § 103(a).

In *Graham* v. *John Deere Co.*, 383 U.S. 1, 17 (1966), the United States Supreme Court "set out a framework for applying the statutory language of [Section] 103 . . . [that] is objective:"

> Under § 103, the *scope and content* of the *prior art are* to be determined; *differences between the prior art and the claims at issue are to be ascertained*; and the level of ordinary skill in the pertinent art resolved. . . . Such secondary considerations as

> commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

KSR, 127 S. Ct. at 1734 (quoting *Graham*, 383 U.S. at 17-18); *see also id.* (reaffirming that these "factors continue to define the [obviousness] inquiry").

b. The Scope And Content Of The Prior Art.

The first step in the *Graham* analysis requires the court to determine the scope and content of the prior art. *See Graham*, 383 U.S. at 17-18. The court has made that determination. *See* Section II. B., *supra*.

c. The Level Of Ordinary Skill In The Art.

The second step in the *Graham* analysis requires the court to determine the level of skill of "one of ordinary skill in the art." *See Graham*, 383 U.S. at 17-18; *see also Ruiz* v. *A.B. Chance Co.*, 234 F.3d 654, 666 (Fed. Cir. 2000) ("The determination of the level of ordinary skill in the art is an integral part of the *Graham* analysis.") (citation omitted).

The parties agree that the court's *Markman* ruling regarding a person of ordinary skill in the art, in 1985, also should be used in the validity determination. *See* TR 1156 (GOVERNMENT COUNSEL: "This is something that's been decided. One of ordinary skill in the art in 1985 is the same, and it has to be the same in the *Markman* proceeding in the infringement stage and then in the validity stage. You have to have the same person. So the Court has decided who the person of ordinary skill in the art is, and we can't change horses midstream here."); *see also* Pl PT Op Def at 23 ("The Court has already determined the level of ordinary skill in the art in its claim construction decision[.]"); *see also* PTX 834 ¶¶ 248-49 (Tannas Direct) ("I understand that the Court has already determined the level of ordinary skill in the art . . . I cannot disagree with the Court's ruling[.]").

Nevertheless, the Government argues that the court's determination of ordinary skill in the art should be interpreted *more specifically*. *See* Gov't PT Def at 19. As Dr. Task testified:

> Specifically, the skilled artisan would have been well versed in or be able to easily understand optical filter techniques, optical filter types (band pass, low pass, high pass, etc.), color display emission spectra, full color display types (superposition of color images vs. spatial integration, for example), monochromatic display transducers, the relationship between wavelengths and color, radiometry, photometry, the wavelengths of the visible spectrum, and the spectral sensitivity of the specific night vision goggles (light amplifying devices) to be used. Knowledge of cockpit geometry might also be necessary to determine the level of blocking required of the filters such that the NVGs are not "overwhelmed." One of ordinary skill in the art

> would possess at least a B.S. in electrical or optical engineering or physics. Two to four years of experience in the areas identified above could also substitute for formal education.

Gov't PT Def at 19 (citing DE 500 ¶ 44 (Task Direct)). Based on this interpretation, the Government contends "that numerous individuals possessed this level of skill in 1985, including [Dr. Task], Ferdinand Reetz, and James Byrd." *Id*.

Honeywell responds that the Government's interpretation "turn[s] one of ordinary skill in the art into one of extraordinary/inventive skill." Pl PT Op Def at 23. Therefore, all of Dr. Task's obviousness testimony is flawed, as it is based on his definition of one of ordinary skill in the art instead of the court's *Markman* definition. *Id*. ("Dr. Task offered no obviousness testimony whatsoever applying the Court's finding of one of ordinary skill in the art[.]"). Honeywell states, however, that at the time of the invention, "there was no one field of engineering that encompassed all skills necessary" and "[n]o one person had in-depth knowledge of all the relevant fields[.]"). PTX 834 ¶ 250 (Tannas Direct).

The court has determined that "one of ordinary skill in the art, in 1985, would be knowledgeable about night vision compatible aids, compatible instrument and panel lighting, and manufacturing displays for military cockpits." *Honeywell II*, 66 Fed. Cl. at 428. In conducting the obviousness inquiry, the court will continue to rely on this definition. *Id*. Therefore, the court has considered whether the '914 patent would be obvious to this hypothetical individual, not to the actual inventor or "to the judge, or to a layman, or to those skilled in remote arts, or to geniuses in the art." *Custom Accessories, Inc*. v. *Jeffrey-Allan Indus., Inc*., 807 F.2d 955, 962 (Fed. Cir. 1986) (internal quotation and citation omitted); *see also KSR*, 127 S. Ct. at 1742 ("The question is not whether the combination was obvious to the patentee[,] but whether the combination was obvious to a person with ordinary skill in the art."); *Envtl. Designs, Ltd.* v. *Union Oil Co.*, 713 F.2d 693, 697 (Fed. Cir. 1983) ("The important consideration lies in the need to adhere to the statute, *i.e.*, to hold that an invention would or would not have been obvious, as a whole, when it was made, to a person of 'ordinary skill in the art' -- not to the judge, or to a layman, or to those skilled in remote arts, or to geniuses in the art at hand.").

The United States Court of Appeals for the Federal Circuit has observed that in considering obviousness, "an expert's testimony is most helpful . . . to explain the technology, the scope and content of the prior art, the differences between the prior art and the invention, and the level of skill in the art." *Petersen Mfg. Co., Inc.* v. *Central Purchasing, Inc*., 740 F.2d 1541, 1547 (Fed. Cir. 1984). The court, however, may conduct the obviousness inquiry without the aid of expert testimony, since obviousness is an issue of law. *See Petersen Mfg.,* 740 F.2d at 1547-48 . In this case, the court has carefully considered and learned a great deal from the expert testimony.

d. The Differences Between The Prior Art And Claims At Issue.

The third step in the *Graham* analysis requires the court to determine any differences between the prior art and the claims at issue. *See Graham*, 383 U.S. at 17-18. This inquiry entails two additional levels of analysis. First, the court must determine whether each of the elements of claim 2 of the '914 patent was disclosed in the prior art. The fact that each element may be found "somewhere in the prior art" is only an indicia of obviousness, and is not determinative. *See In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000); *see also Stratoflex, Inc.* v. *Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) ("Though findings on the 'differences' from the prior art are suggested by *Graham* v. *John Deere* . . . the question under 35 USC § 103 is not whether the differences themselves would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention as a whole would have been obvious."). Second, the court must compare the invention as a whole to the prior art. *See* 35 U.S.C. § 103; *see also Medtronic, Inc.* v. *Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 1567 (Fed. Cir. 1983) ("In determining obviousness/ nonobviousness, an invention must be considered 'as a whole', 35 U.S.C. § 103, and claims must be considered in their entirety.") (citation omitted); *W.L. Gore & Assoc., Inc.* v. *Garlock, Inc.*, 721 F.2d 1540, 1548 (Fed. Cir. 1983). In conducting each part of this additional analysis, the court must render a decision from the vantage point of the person with ordinary skill in the art, in 1985. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1258 (Fed. Cir. 2007) ("An invention is unpatentable as obvious if the differences between the patented subject matter and the prior art would have been obvious at the time of invention to a person of ordinary skill in the art."); *see also Orthopedic Equip. Co.* v. *United States*, 702 F.2d 1005, 1012 (Fed. Cir. 1983) ("The person of ordinary skill in the art at the time of the patentee's invention . . . is presumed to have before him all of the relevant prior art.").

i. Comparison Of The Elements Of Claim 2 Of The '914 Patent With Prior Art.

(a) Claim 2 Preamble: "A Display System For Use In Association With A Light Amplifying Passive Night Vision Aid And A Local Color Display Including A Local Source Of Light Having Blue, Red, And Green Color Bands."

L-3 argues that nine prior art references disclose the Preamble to claim 2, disclosing: "a display system for use in association with a light amplifying passive night vision aid and a local color display including a local source of light having blue, red, and green color bands." *See* L-3 PT Def at 13-14 (chart referencing VERNEY (DE 511;DE 500 ¶ 129); TRIMMIER (DE 514; DE 500 ¶ 126); LLOYD (DE 521 at GVT008-1980; DE 500 ¶ 166); KNIGHT & RITTER (DE 513 at GVT008-1998); SCOUGHTON (DE 522); DE 500 ¶ 167; TASK (DE 506-510 at GVT075-0046); DE 500 ¶ 104; TR 1067, 1072 (Tannas); REETZ[20] (DE 301 at GVT018-1026)); DE 500 ¶ 116; *see also* TR 1063, 1078 (Tannas); BOEHM (DMX 4); DE 500 ¶ 131; TR 1295-96 (Tannas); GERMAN PATENT (DE 505 at GVT007-926); DE 500 ¶ 135. The Government also contends that VERNEY discloses the Preamble

[20] The court has determined that the REETZ THESIS was not prior art.

of claim 2. *See* Gov't PT Def at 33 (chart referencing VERNEY (DE 511 at GVT009-0780)); *see also* TR 1096, 1347 (Tannas).

(1) Uncontested Prior Art.

Honeywell does not contest the Government and Defendant-Intervenors' assertion regarding VERNEY,[21] TRIMMIER,[22] LLOYD,[23] SCOUGHTON,[24] and BOEHM,[25] and the court has determined that these references disclose the elements of the claim 2 Preamble. *See* Pl PT Op Def at 18-74; *see also* PTX 834 at 108-17, (discussing LLOYD), 127-28 (discussing BOEHM), 141-43 (discussing VERNEY), 143-44 (discussing TRIMMIER), 147-49 (discussing SCOUGHTON).

(2) TASK & GRIFFIN III And KNIGHT & RITTER.

Honeywell argues that TASK & GRIFFIN III, the REETZ THESIS,[26] KNIGHT & RITTER, and the GERMAN PATENT do not disclose the Preamble of claim 2. *See* Pl PT Op Def at 18-19 (stating that TASK & GRIFFIN III (DE 508) does not "deal[] with a full color display"); *see also* PTX 834 at 7-16, 47 (Tannas). Instead, Honeywell contends that TASK & GRIFFIN III and KNIGHT & RITTER[27] do not

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[21] VERNEY discloses a filter to be used with the "master caution, fire warnings and the vertical instrument display system" so they do not adversely affect NVG performance. *See* DE 511 at GVT009-0780.

[22] TRIMMIER is an article that provides an overview for advanced color display technologies in the cockpit including "multifunction displays" that are "[NVG] compatible." *See* DE 514 at GVT018-1662-63.

[23] LLOYD, "Helicopter Cockpit Design for Night Goggle Compatibility," discusses cathode ray tube compatibility with NVGs. *See* DE 521 at GVT008-1980 ("Cathode ray tubes and other phosphor displays emit little or no near infra-red energy and therefore are either immediately compatible with night goggles or require modest filtering or dimming.").

[24] SCOUGHTON discloses a color multifunction display and a filter that allows a pilot to see yellow, blue, and green while using NVGs. *See* DE 522 at GVT009-0394-95 ("With the appropriate pull-down filter, this unit is also NVG compatible[.]").

[25] BOEHM discusses several methods for making helicopter lighting and displays compatible with NVGs. *See* DMX 4 at D000586. The article specifically states that NVGs were "successfully tested with a colour [multifunction display] and a CGI simulator." DMX 4 at D000607.

[26] The court has determined that the REETZ THESIS is not prior art.

[27] Honeywell states that KNIGHT & RITTER "describes the same . . . study that is discussed in TASK & GRIFFIN I-III . . . and lists the techniques that were used to improve NVG compatibility in that study. . . . [KNIGHT & RITTER] does not disclose or suggest the invention of claim 2 for at

"disclose a 'display system,'" because neither discloses a "display of colors." *Id*. Mr. Tannas explained that a display of colors is not disclosed, because "the film used in the moving map display would not necessarily be a color film. Non-color films were known to be used in moving map displays . . . and nothing in [TASK & GRIFFIN III] indicates that the map had to be used with a color film." PTX 834 ¶ 13 (Tannas). Mr. Tannas also asserts that TASK & GRIFFIN III does not disclose a "local color display . . . because the AN/PVS-5 [NVGs] described . . . were designed so that the user could not look under or around the goggles to see the cockpit instruments and displays." *Id.* Therefore, Mr. Tannas states the display would not be "perceptible to an observer" utilizing a night vision aid. *Id*.

The court has determined that the Preamble of claim 2 was disclosed by the TASK ARTICLES and KNIGHT & RITTER. The TASK ARTICLES address the need to achieve compatibility between cockpit lighting, displays, and NVGs. *See* DE 500 ¶ 100 (Task Direct). The court recognizes that Mr. Tannas testified that the map in the display would "not *necessarily* be a color film" and "nothing in [the TASK ARTICLES] indicate that the map *had* to be used with a color film." *See* PTX 834 ¶ 13 (Tannas) (emphasis added). Nevertheless, Mr. Tannas concedes that the map display could be a color film. *Id.* In addition, the map display was described as "a full color projection of standard aeronautical charts" in a Department of Defense document. *See* DE 527 at GVT011-4526 ("The system consists of a display unit which houses the 35mm filmstrip cassette, lamp, optics, and controls . . . . Filmstrips are 35mm *color* reproductions of selected aeronautical charts[.]") (emphasis added); *see also* DE 500 ¶ 104 (Task) ("[T]he moving map display was known as a 'full color display,'" as "referenced in a March 1978 technical report[.]"). Therefore, the prior art discloses a display system based on the court's construction that the prior art disclosed a "display of colors." *See Honeywell II*, 66 Fed. Cl. at 437.

The TASK ARTICLES discuss compatibility with AN/PVS-5 NVGs that had a face mask preventing an operator from looking under or around the goggles. *See* PTX 834 ¶ 13 (Tannas); *see also* DE 506 at GVT009-0472. That does not mean, however, that the TASK ARTICLES did not disclose "[a] device that may be used together on in combination with optical filters and shows or exhibits at least one color perceptible to *an* observer or observers utilizing *a* night vision aid." *Honeywell II*, 66 Fed. Cl. at 444 (emphasis added); *see also In re Hedges,* 783 F.2d 1038, 1041 (Fed. Cir. 1986) ("[P]rior art as a whole must be considered."). Therefore, although the TASK ARTICLES do not disclose a device perceptible to an observer using standard configuration AN/PVS-5 NVGs, but instead disclose a device perceptible to an observer using *a* night vision aid. For this reason, Col. Lawrence testified that the AN/PVS-5's face mask could be cut away allowing a pilot to see the controls. *See* TR 996-98 (Lawrence). Even if the NVGs would make operating a helicopter more difficult, the cut-away NVGs demonstrate that the map would be perceptible to an observer using *a* night vision aid. *See* TR 998 (Lawrence) ("So in order to look at the instrumentation -- I had a choice of either looking through the goggles and seeing what I wanted to see outside, or raising my head up so I could see the instrumentation."). Significantly, AVNIS-6 NVGs, that allowed the pilot

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least the same reasons I stated above with respect to DE-508 to DE-510." PTX 834 ¶ 449 (Tannas). Therefore, KNIGHT & RITTER must be analyzed together with the TASK ARTICLES.

to look under the goggle at a display, were available in 1985. *See* TR 1074-75 (Tannas). The ANVIS-6 goggles also could be a night vision aid, used in conjunction with the display described in the TASK ARTICLES. Moreover, the TASK ARTICLES discuss the Army's interest in developing cockpit lighting in a configuration where: "the pilot [would] wear [NVGs] for piloting the aircraft while the copilot did not wear goggles so that he could monitor the aircraft instruments[.]" DE 506 at GVT009-0472.

(3) GERMAN PATENT.

Honeywell also argues that the GERMAN PATENT is not "perceptible to an observer . . . using a night vision aid," because it does "not disclose or suggest a person utilizing a night vision device could look under or around the device to see any colors displayed on the instrument panel." PTX 834 ¶ 374 (Tannas). The GERMAN PATENT discloses a "[d]evice for observing a luminous indicating instrument in such a way that in darkness it is observable both with the naked eye or with the aid of a night-vision device[.]" DE 505 at 2 ¶ 1. Contrary to Honeywell's arguments, the court's claim construction does not require that the GERMAN PATENT disclose how to "look under or around the [NVGs]." *Compare Honeywell II*, 66 Fed. Cl. at 444 *with* PTX 834 ¶ 374 (Tannas). Therefore, the GERMAN PATENT discloses the Preamble of claim 2.

* * *

For these reasons, the court has determined that the following prior art discloses "a display system for use in association with a light amplifying passive night vision aid and a local color display including a local source of light having blue, red, and green color band:" VERNEY; TRIMMIER; LLOYD; KNIGHT & RITTER; SCOUGHTON; BOEHM; the TASK ARTICLES; and the GERMAN PATENT.

(b) Claims 2(a), 2(a)(1), 2(a)(2): "A Plurality Of Filters At The Local Color Display including (1) A First Filter For Filtering The Blue Color Band Of The Local Source Of Light; (2) A Second Filter For Filtering The Green Color Band Of The Local Source Of Light"

The Government and Defendant-Intervenors argue that five prior art references disclose claims 2(a), 2(a)(1), and 2(a)(2), *i.e.*, a "plurality of filters at the local color display including (1) a first filter for filtering the blue color band of the local source of light; (2) a second filter for filtering the green color band of the local source of light."[28] *See* L-3 PT Def at 13-14 (chart referencing the TASK ARTICLES (DE 510 at GVT075-0046; DE 500 ¶ 106); REETZ THESIS (DE 301 at GVT018-21;[29] DE 500 ¶ 119); UCHIDA (DE 515 at GVT009-0486; DE 500 ¶ 174); STOLOV (DE 519 at 1; DE 500

[28] L-3 cites VERNEY, TRIMMIER, and BOEHM as suggesting a full color display in an aircraft. *See* L-3 PT Def at 13-14 (chart).

[29] The court has determined that the REETZ THESIS was not prior art.

¶ 178; TR 1059 (Tannas)); *see also* Gov't PT Def at 33 (chart referencing VERNEY (DE 511 at GVT009-0780)).

(1) UCHIDA, STOLOV, And VERNEY.

The Government relies on Mr. Tannas's testimony that UCHIDA, STOLOV, and VERNEY suggest a plurality of filters at the local color display:

GOVERNMENT COUNSEL:	So it's not the putting of a filter on a display what you claim was new in 1985?
MR. TANNAS:	Right[.]

TR 1054.

* * *

GOVERNMENT COUNSEL:	UCHIDA and [STOLOV] both have a first filter for filtering their blue color band for their local source of light?
MR. TANNAS:	Correct.

TR 1059-60.

* * *

GOVERNMENT COUNSEL:	UCHIDA and [STOLOV] both have a second filter for filtering the green color band. Right?
MR. TANNAS:	That is correct.

TR 1060.

* * *

GOVERNMENT COUNSEL:	[F]ilters like this CMFD lamp filter were known in 1985, right?
MR. TANNAS:	Yes, they were.

TR 1149; *see also* TR 1171 ("It's very clear and distinct that [VERNEY is] suggesting that [the filter] be used to block the infrared on a color CRT.")

Nevertheless, Honeywell contests the Government's assertion that the prior art disclosed using separate filters for red, green, and blue. *See* Pl PT Op Def at 21 ("[T]he prior art fails to disclose making an NVG compatible full color display using separate filters for red, green and blue.") (citing PTX-834 ¶ 242 (Tannas)). UCHIDA, however, discloses a "liquid crystal multicolor display using color filters." DE 515 at GVT009-0486. STOLOV also discloses a LCD panel with "three filters of the colors red, green and blue." DE 519 Abstract. In fact, Mr. Tannas agreed that UCHIDA and STOLOV disclosed claims 2(a), 2(a)(1), and 2(a)(2):

GOVERNMENT COUNSEL:	So each of these combinations, because they contain UCHIDA or [STOLOV], each of the combinations have a first filter for filtering the blue color band?
MR. TANNAS:	That is correct[.]
GOVERNMENT COUNSEL:	UCHIDA and [STOLOV] both have a second filter for filtering the green color band. Right?
MR. TANNAS:	That is correct.

TR 1059-60.

Therefore, UCHIDA (DE 515) and STOLOV (DE 519) disclose claims 2(a), 2(a)(1), and 2(a)(2) of the '914 patent. The court, however, does not agree with the Government's assertion that Mr. Tannas admitted that VERNEY discloses claim 2(a). *See* Gov't PT Def at 34. Mr. Tannas agreed only that VERNEY teaches using a single filter to block infrared light. *See* TR 1171 (Tannas) ("[I]t's very clear and distinct that [VERNEY is] suggesting that [the filter] be used to block the infrared on a color CRT."). Accordingly, the court has determined that VERNEY does not disclose claim 2(a).

(2) TASK ARTICLES.

Honeywell contends that TASK & GRIFFIN III does not disclose claims 2(a), 2(a)(1), and 2(a)(2) of the '914 patent. *See* Pl PT Op Def at 105-06 ("The Government failed to demonstrate that TASK & GRIFFIN III (DE-508) discloses 'a plurality of filters at the local color display.'"). DE 510 is a presentation based on the TASK ARTICLES. The court already has determined that TASK & GRIFFIN III does not disclose "a plurality of filters at the local color display including (1) a first filter for filtering the blue color band of the local source of light; (2) a second filter for filtering the green color band of the local source of light." Therefore, the TASK ARTICLES (DE 510) do not disclose claims 2(a), 2(a)(1), and 2(a)(2).

* * *

For these reasons, the court has determined that the following prior art references disclose claims 2(a), 2(a)(1), and 2(a)(2): UCHIDA and STOLOV.

(c) Claim 2(a)(3): "A Third Filter For Filtering The Red Color Band Of The Local Source Of Light And Passing A Narrowband Of The Red Color Band."

(1) TASK & GRIFFIN I And KNIGHT & RITTER.

L-3 argues that TASK & GRIFFIN I discloses claim 2(a)(3), because the Glendale Green filter splits the red color band between 630 nm and 650 nm. *See* L-3 PT Def at 24 (quoting DE 500 ¶ 88) (Task) ("TASK [&] GRIFFIN I disclose[s] that the red color band should be split between 630 nm and 650 nm[.]"); DE 506 at GVT009-0476).

As previously discussed in the court's anticipation analysis, the Government has not established by clear and convincing evidence that the Glendale Green filter disclosed in TASK & GRIFFIN III passed a narrowband of the red color band. Moreover, TASK & GRIFFIN I does not explicitly state that the filter passes a narrowband of the red color band; instead, TASK & GRIFFIN I identifies the need for improvements to allow the filter to pass a narrow band of the red color band. *See* DE 506 at GVT009-0476 ("The laser safety material used for blocking the infra-red radiation from critical incandescent instrument lights needs to be improved to pass more visible light in the red region (630 nm) and to block the light better toward the far red and infra-red region (650 nm to 900 nm)."). Although some of the transmission spectra for various modifications of the Glendale Green filter in DE 516 show that a narrowband of the red color band is passed, all of the spectra have handwritten values and irregularly-spaced intervals on the x-axis. *See* DE 516 at LHM 0000466-474; PTX 834 ¶ 135 ("The wavelength values (in nanometers) are handwritten and irregularly spaced, and it is unclear how they came to appear on the graph. To me, Figure 1 appears to be a laboratory scan generated to show the performance of the filter sample in a qualitative sense, not for the purpose of showing its spectral characteristics in any precise way."). Accordingly, the court has determined that the Government and Defendant-Intervenors have not established by clear and convincing evidence that TASK & GRIFFIN I & III disclose claim 2(a)(3).

Next, L-3 argues that KNIGHT & RITTER also discloses using a Glendale Green filter as the third filter in claim 2(a)(3). *See* L-3 PT Def at 14; *see also* DE 500 ¶¶ 148-49. The disclosure in KNIGHT & RITTER, however, is only a summary of tests discussed in the TASK & GRIFFIN ARTICLES. *See* DE 513 at GVT008-1997-98; *see also* DE 500 ¶ 149 ("In a section entitled 'Night Vision Test By Others' a summary is provided of the TASK & GRIFFIN III effort including the use of the Glendale Green filter and discusses the filtering of the moving map display."). Because KNIGHT & RITTER summarizes the findings of the TASK ARTICLES, the court has determined that KNIGHT & RITTER does not disclose claim (2)(a)(3) of the '914 patent.

(2) BOEHM.

L-3 also argues that BOEHM discloses claim 2(a)(3), because the BG-7 glass filters a narrowband of the red color band. *See* L-3 PT Def at 18 (citing DE 500 ¶ 130 (Task) ("BOEHM discloses the use of filters in front of the displays[.]"); *see also* DMX 4 at D000590). Honeywell responds that L-3 failed to produce clear and convincing evidence that the BG-7 filter would pass a narrowband of the red color band, when combined with UCHIDA or STOLOV. *See* Pl PT Op Def at 68 ("L-3 . . . points to no evidence, much less clear and convincing evidence, that the BG-7 filter of BOEHM (DMX-4) would pass a 'narrowband of the red color band[.]'"). Moreover, Honeywell criticizes L-3 for not providing a spectral analysis, using a typical incandescent lamp emission curve with the BG-7. *Id.* at 68-69 (citing DE 500 at 64-65). In addition, Honeywell contends that Dr. Task never testified that BG-7 passes a narrowband of the red color band. *Id.* at 69 (citing DE 500 at 41, 64, 96; DE 526-18; DE 558). Even if Dr. Task had done so, a "narrowband of the red color band cannot be proven with a filter spectrum alone," because the BG-7 would filter the light from a full color display differently. *Id.* at 29, 69 ("An incandescent bulb is *not* a full color display."). For this reason, Mr. Tannas testified that if UCHIDA or STOLOV were filtered with BG-7, "the resulting display would not be a full color display." *See* PTX 834 (Tannas).

Although L-3 did not provide a separate spectral analysis, BOEHM discloses the wavelengths transmitted when an electro-luminescent is filtered by the BG-7. *See* DMX 4 at D000590 (graph); *see also id.* at D000588 ("The last diagram contains the relative luminance of low electro-luminescent (EL) illuminations with blue and green colour and the transmission of a dyed-glass filter (BG 7) and a cut-off filter (OG 590)."). As the court previously determined, the red color band in claim 2(a)(3) is a range of color from 620 nm and 780 nm. *See Honeywell II*, 66 Fed. Cl. at 471. Dr. Task testified that BOEHM demonstrates that the BG-7 filter passes "the red color band" from 620 nm to approximately 710 nm. *See* DE 500 at ¶ 88 ("BOEHM discloses a splitting of the red color band at about 710 nm[.]"); *see also id.* at ¶ 130 (charts). In addition, Mr. Tannas's calculations demonstrate that a TB-29 tri-band phosphor lamp filtered with the BG-7 filter would pass light in the red color band. *See* PTX 834 ¶¶ 403-05; *see also* PTX 937 (chart "BG-7 Filter, TB-29 Lamp, and Convolution"). Mr. Tannas also testified that, even if UCHIDA or STOLOV utilized a BG-7 filter, the result would not be a "full color display," because the BG-7 filter would "suppress red to such a degree that any red light passing through the filter would not be sufficient to provide the red primary of a full color display." PTX 834 ¶ 404. The court's claim construction, however, did not require the *perception* of the red primary of a full color display. *See Honeywell II*, 66 Fed. Cl. at 487 (defining "narrowband of the red color band" as "a narrow range of wavelengths within the red color band."). The "local color display" limitation of claim 2, however, requires that "at least one color [be] perceptible." *Id*. at 444. Therefore, claim 2 of the '914 patent requires only that the "local color display" emit light within a wavelength within the "red color band" *and* be perceptible. Claim 2 does not require that the color be *perceived* as red. For this reason, the court has determined that BOEHM discloses claim 2(a)(3) of the '914 patent.

(3) GERMAN PATENT.

In addition, L-3 argues that the GERMAN PATENT discloses claim 2(a)(3). *See* L-3 PT Def at 13 (citing DE 500 at GVT007-0926; DE 500 ¶ 133 (Task)). Dr. Task testified that the GERMAN PATENT "provides one with skill in the art a recipe of how to design the two filters, their allowed passing and blocking wavelength bands and the amount of passing or blocking required." DE 500 ¶ 134. The GERMAN PATENT also "provides a specific example of a possible first filter and second filter set," where the first filter still passes measurable light at 650nm that is "well within the red color band." *Id.* at ¶¶ 136-37. Mr. Tannas also explains that the GERMAN PATENT does not disclose a filter for "passing a narrowband of the red color band," because the ' 914 patent states that "filter A only lets short-wave light of, e.g., $\lambda < 600$ nm, escape unfiltered[.]" PTX 834 ¶ 380 (quoting DE 505 at GVT007-0927). Based on the filters disclosed in the GERMAN PATENT, the transmittance of filter A at 620 nm approaches 0.01. *Id.* ¶¶ 381-83 ("[T]he 50% point for the filter is below 550 nm, and at 620 nm, the transmission is approaching 0.01. These are not the properties of a filter that passes a narrowband of the red color band[.]").

The court construed "the red color band" as a range of color from 620 nm and 780 nm. *See Honeywell II*, 66 Fed. Cl. at 471. The GERMAN PATENT, however, discloses that the first filter only lets light below 600 nm "escape *unfiltered* from the instrument display[.]" DE 505 at GVT007-0927 (emphasis added). The GERMAN PATENT also identifies a weak light flux between 650 nm and 900 nm is transmitted from the display through the first filter. *Id*. Therefore, the court agrees with Dr. Task's conclusion that one skilled in the art would understand that the first filter [of the GERMAN PATENT] must transmit light between 600 nm and 650 nm. *See* DE 500 ¶ 137 ("The action of this display filter between 600 nm and 650 nm is not specifically identified in this example, but one skilled in the art would understand that filters cannot instantly go from completely passing to completely blocking but rather require some transition band of wavelengths[.]"). This testimony also demonstrates that the filter would allow the entire spectrum of the red color band to pass, and therefore, would not be a "narrowband of the red color band." *Id.* Accordingly, the court has determined that the Government and Defendant-Intervenors have not presented clear and convincing evidence that the GERMAN PATENT passes a "narrowband of the red color band."

(4) SCOUGHTON.

In addition, L-3 argues that SCOUGHTON discloses claim 2(a)(3). *See* L-3 PT Def at 14 (citing DE 522 at GVT009-0394; DE 500 ¶ 167). SCOUGHTON discloses a multifunction display ("MFD") with a pull down filter that allows the "discrimination of . . . yellow, blue and green." DE 522 at GVT009-0395. Dr. Task testified that "in order for yellow to be visible the filter must allow the transmission of some of the red phosphor light . . . because that is how one achieves yellow in this particular three-color shadow-mask CRT." DE 500 ¶ 168. Mr. Tannas, however, advised the court that "no conclusion can be reached without reliable spectral data showing the wavelengths of light emitted by the display and the amount of energy at each wavelength." PTX 834 ¶ 453.

SCOUGHTON does not disclose what wavelengths of light are passed through the filter. *See* DE 522. Moreover, the court considers Dr. Task's opinion that the filter *must have* transmitted some red light as mere conjecture. *See* DE 500 ¶ 168. Therefore, neither the Government nor Defendant-Intervenors have established by clear and convincing evidence that SCOUGHTON discloses a filter that "passes a narrowband of the red color band."

(5) VERNEY.

Finally, both the Government and Defendant-Intervenor argue that VERNEY discloses claim 2(a)(3). *See* Gov't PT Def at 34 (citing DE 511 at GVT009-0780; DE 500 ¶ 128); L-3 PT Def at 14 (citing DE 511 at GVT009-0780; DE 500 ¶ 128; TR 1548, 1584, 1660-61 (Task), 1158 (Tannas)). Dr. Task testified that VERNEY discloses a filter that "shows *excellent transmission* out to about 640 nm and *measurable transmission* out to about 700 nm." DE 500 ¶ 127 (emphasis in original) (citing DE 511 at GVT009-0780). Honeywell does not dispute that VERNEY discloses claim 2(3)(a). *See* Pl PT Op Def at 61-62. Mr. Tannas also agreed that "[VERNEY] is very close to the CMFD filter." TR 1158 (Tannas). Therefore, the court has determined that VERNEY discloses claim 2(a)(3).

* * *

For these reasons, the court has determined that the following prior art references disclose claim 2(a)(3): BOEHM, VERNEY, and SCOUGHTON.

(d) Claim 2(b): "A Fourth Filter Which Filters Light At The Night Vision Aid, Said Fourth Filter Cooperating With Said Plurality Of Filters To Substantially Block At Least Said Narrowband Of The Red Color Band From Being Admitted To The Night Vision Aid."

(1) BOEHM.

L-3 argues that BOEHM "discloses the use of filters that are placed over displays to pass shorter wavelengths of light in the blue and green spectrum combined with a NVG filter that can be used at 570 nm, 590 nm, or 630 nm depending on how much color is needed." L-3 PT Def at 15-16; *see also* DE 500 ¶ 130 ("BOEHM discloses the use of filters in front of the displays (BG-7 glass, Figure 3, DMX 4 at D000590) and different filters in front of the NVGs (OG-570, OG-590, and RG-630 cut-off filters, DMX 4 at D000603[.]). This is the same *complementary filter* concept discussed previously.") (emphasis in original).

Honeywell responds that L-3's argument that various filters "can be used at 570 nm, 590 nm, or 630 nm depending on how much color is needed" is in error, because BOEHM says nothing about "choosing these filters based upon 'how much color is needed[.]'" *See* Pl PT Op Def at 71 (citing DMX 4 at D000603; L-3 PT Def at 16). In addition, Honeywell asserts that BOEHM does not "suggest[] that the various NVG filters were even tested in the presence of cockpit lights" and that

L-3 interprets BOEHM in a manner inconsistent with both Dr. Task's and Mr. Tannas's testimony. *Id*. Moreover, Honeywell argues that the prior art must disclose "both a filter on a display and a filter on the NVGs, *both* of which must have a cut-off in the red color band." *Id.* at 72 (citing PTX 834 ¶ 262) ("The third and fourth filters of claim 2 . . . are used to 'split' the red color band, so that the third filter passes a 'narrowband of the red color band' and the fourth filter substantially blocks that narrowband of the red color band from being admitted to the night vision goggles").

BOEHM states that "[a]n OG 570, OG 590 . . . and an RG 630 cut-off filter from Schott have been successfully tested with the 2nd and 3rd generation NVG." DMX 4 at D000603. BOEHM further discloses that "NVG[s] can use cut-off filters in front of the objective lens." *Id.* at D000607. In addition, the RG 630 cut-off filter will block all wavelengths below 630 nm but allow wavelengths greater than 630 nm. *See* L-3 PT Def at 16 ("[A] NVG filter that can be used at 570 nm, 590 nm, or 630 nm."). As such, the court has determined that BOEHM discloses a "third filter for filtering the red color band of the local source of light and passing a narrowband of the red color band. Claim 2(b), however, does not require the prior art to disclose how to choose a filter based on "how much color is needed." Therefore, the court has determined that BOEHM discloses claim 2(b).

(2) TASK & GRIFFIN III.

L-3 also argues that TASK & GRIFFIN III discloses claim 2(b), because the red plastic filter placed over the NVGs blocks light sufficiently to allow the NVGs to function properly. *See* L-3 PT Def at 30; *see also* DE 500 ¶ 111 ("[T]he red plastic filter mounted in an anti-flare baffle placed over the front lens of the NVGs . . . blocked the offending light sufficiently to permit the NVGs to function as intended.").

In the anticipation analysis, the court determined that TASK & GRIFFIN III did not disclose claim 2(b), because there was no disclosure of element 2(a)(3). In an obviousness inquiry, however, the court is required also to consider combinations of elements from prior art sources in determining whether a patent is valid. *See KSR*, 127 S. Ct. at 1739 ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results."). Therefore, here, it is not necessary for TASK & GRIFFIN III to disclose claim 2(a)(3) to disclose 2(b). Figure 8 of TASK & GRIFFIN III shows a comparison of NVG sensitivity with and without the red plastic filter. *See* DE 508 at DE-1615. This figure also shows that the addition of the red plastic filter makes the NVGs less sensitive to light than they would be in the red color band. *Id.* TASK & GRIFFIN III, however, only discusses the use of the red plastic filter in the context of making the NVGs compatible with light from a display that had been filtered to block all light from the red color band. *Id.* at DE-1615-16 ("To reduce the overlap still further, a red plastic filter was placed over the NVGs that was also highly transmissive in the near infra-red. . . . Under these conditions the emission of the display and the sensitivity of the NVG have almost no overlap; thus effectively eliminating the interference of the display with proper operation of the NVGs."). Because TASK & GRIFFIN III does not discuss how the red plastic filter would work substantially to block a

narrowband of the red color band nor explain how the red plastic filter would work in conjunction with a light source, the court has determined that TASK & GRIFFIN III discloses claim 2(b).

(3) GERMAN PATENT.

Next, L-3 argues that the GERMAN PATENT discloses claim 2(b) of the '914 patent. *See* L-3 PT Def at 13 (citing DE 505 at GVT007-0926; DE 500 ¶ 133). Specifically, Dr. Task testified that the GERMAN PATENT discloses "a second filter at the night vision aid that has the *complementary filtering* action, namely blocking the shorter wavelengths of light that were passed by the first filter[.]" DE 500 ¶ 133 (emphasis in original). Dr. Task also testified that the GERMAN PATENT disclosed claim 2(b) in two ways. *Id*. ¶¶ 134-38. First, the GERMAN PATENT provides a "recipe" to one skilled in the art "of how to design the two filters, their allowed passing and blocking wavelength bands and the amount of passing and blocking required, in order to successfully apply the invention." *Id.* ¶ 134 (citing DE 505 at GVT007-0926). Second, because an observer can read the instrument panel while looking through the NVG, the NVG is still functioning, and therefore, "substantially blocks" the narrowband of the red color band. *Id*. ¶ 138 (citing DE 5050 at GVT007-0923, 926). In other words, if the filter at the NVG did not substantially block a narrowband of the red color band, the NVGs would be overwhelmed and an observer would not be able to read the instrument panel while using the NVGs. *Id*. ¶ 138; *see also* DE 505 at GVT007-0926 ("The invention makes it possible for a luminous indicating instrument to be read perfectly both from an observer with the naked eye and from an observer looking through a night-vision device."). On the other hand, Mr. Tannas testified that "the specification for [the second filter] is so broadly defined, it is impossible to determine what wavelengths are passed and blocked." PTX 834 ¶ 385. Mr. Tannas also pointed out that the second filter "could not block a 'narrowband of the red color band' because no such narrowband would be passed by filter A over the display." *Id*.

The court is satisified that Dr. Task identified how one skilled in the art, in1985, could determine that the GERMAN PATENT disclosed a filter at the NVG that "substantially block[ed]" a "narrowband of the red color band." *See* DE 500 ¶¶ 133-38. Mr. Tannas's broad assertion that it is "impossible to determine what wavelengths are passed or blocked," however, is not sufficient to rebut clear and convincing evidence to the contrary. *See* PTX 834 ¶ 385. Therefore, the court has determined that the GERMAN PATENT discloses claim 2(b).

(4) VERNEY.

Finally, the Government argues that VERNEY also discloses claim 2(b). *See* Gov't PT Def at 34 (citing DE 511 at GVT009-0780); TR 203 (Bradford); TR 352 (Reetz); *see also* TR 1056 (Tannas). VERNEY tested a filter with ANVIS NVGs. *See* Gov't PT Def at 34 (citing DE 511 at GVT009-0780). In 1985, ANVIS NVGs were known to contain minus-blue filters. *See* TR 352 (Task) (testifying that ANVIS NVG had "[t]he 625 nanometer minus blue filter"); *see also* TR 1056 (Tannas). Therefore, the Government insists that the "filter *must have* 'substantially blocked' the narrowband of the red color band, as VERNEY notes that his filter permitted the goggles to function for their intended purpose." *See* Gov't PT Def at 33 (emphasis added) (citing DE 511 at GVT009-

0780 (stating that light from the display can be seen in the NVGs without "adversely affecting their performance")).

Honeywell responds that Dr. Task's testimony that "VERNEY does not talk about a filter that is used over the night-vision goggles" directly contradicts the Government's assertions. *See* Pl PT Op Def at 62 (citing TR1696-97) (TASK) ("I don't remember . . . that there was an indication in here that he had used a filter over the night-vision goggles."). Moreover, neither Mr. Bradford nor Mr. Reetz discussed either VERNEY or the NVGs discussed therein. *See* Pl PT Op Def at 62. Although Mr. Bradford and Mr. Reetz discussed using a 625 nm cut-off filter for ANVIS NVGs, their testimony does not "compel[] the conclusion that the ANVIS referenced in VERNEY had a 625 nm cutoff filter." *Id*. (citing TR 158 (Bradford); TR 338, 340, 352 (Reetz)). In addition, Honeywell points out that there is evidence in the record "demonstrating that the minus blue filters on ANVIS goggles had a cutoff at 600 nm, not 625 nm[.]" Pl PT Op Def at 62-63 (citing DE 517 at GVT055-000016 ("for the third generation ANVIS . . . a filter is applied to the [lens] which yields a sharp cutoff of sensitivity near 600 nanometers")).

Therefore, the court has determined that the Government proffered no evidence that VERNEY disclosed a "fourth filter" that "substantially blocks" a "narrowband of the red color band." Instead, the Government relied on Dr. Task's conjecture that the ANVIS goggles discussed in VERNEY would have a 625 nm cutoff. On the other hand, Honeywell proffered evidence that the ANVIS goggles discussed in VERNEY must have had a 600 nm cutoff. *See* DE 517 at GVT055-000016. For these reasons, the court has determined that the Government and Defendant-Intervenors did not establish by clear and convincing evidence that VERNEY discloses claim 2(b).

* * *

For these reasons, the court has determined that the following prior art references disclose claim 2(b): BOEHM and the GERMAN PATENT.

ii. Considerations Of The '914 Patent As A Whole.

As discussed above, the Government and Defendant-Intervenors have demonstrated by clear and convincing evidence that all of the elements of claim 2 were disclosed by prior art. This ruling, however, is not dispositive, because the obviousness inquiry "requires a series of factual assessments culminating in an often-difficult qualitative judgment of the creative achievement involved in the invention." ADELMAN, *supra*, at 309. Therefore, the court also must examine the claimed invention "as a whole," through the eyes of "a person having ordinary skill in the art." 35 U.S.C. § 103(a); *see also In re Translogic Tech., Inc.*, 504 F.3d at 1257 ("An invention is unpatentable as obvious if the differences between the patented subject matter and the prior art would have been obvious at the time of invention to a person of ordinary skill in the art.") (citing *In re Gartside*, 203 F.3d 1305, 1319 (Fed. Cir. 2000)) ("A claimed invention is unpatentable as obvious if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the

art to which said subject matter pertains.") (quotation omitted); ADELMAN, *supra*, at 309 ("To avoid undervaluing the combination, section 103 requires the obviousness assessment to compare the invention as a whole to the prior art."); *see also id.* at 310 ("[T]he . . . court must make the determination from the vantage point of a 'person having ordinary skill in the art.'"). Accordingly, even if prior art did not disclose all the elements, the court could still determine that the '914 patent was obvious.

(a) Prior Art Combinations.

(1) The Parties' Arguments.

L-3 argues that BOEHM, when combined with UCHIDA or STOLOV, renders claim 2 obvious. *See* L-3 PT Def at 14-15. L-3 contends that BOEHM "identifies a method of complementary filtering for helicopter pilots to use NVGs and when needed to look down to view a color display with the naked eye." L-3 PT Def at 15 (citing DE 500 at 64; DMX 4). Therefore, combining BOEHM with the full color display disclosed in UCHIDA or STOLOV would render claim 2 of the '914 patent obvious. *See* L-3 PT Def at 18 (chart). In addition, L-3 argues that VERNEY and TRIMMIER provide the motivation to combine BOEHM with other references. *See* L-3 Def Reply at 31-32 ("[T]he elements disclosed in the BOEHM reference ("A") combined with UCHIDA ("B") in light of the suggestions to combine NVG filtering and LCDs from VERNEY ("C") [DE-511 GVT009-0782] is sufficient to establish obviousness. VERNEY, however, is not the only motivating reference. TRIMMIER also suggests the combination of NVG compatibility techniques with LCDs.").

Honeywell responds that BOEHM, when combined with UCHIDA or STOLOV, is not obvious, because: (1) BOEHM did not combine complementary filters and full color CRT displays; (2) the combination of BOEHM with UCHIDA or STOLOV does not demonstrate the obviousness of using separate filters for red, green, and blue and does not have a "narrowband of the red color band;" and (3) L-3 mischaracterizes the teachings of BOEHM. *See* Pl PT Op Def at 65-73. BOEHM does not teach: (1) complementary filtering when viewing a color display with the naked eye; (2) the use of filters placed over displays; (3) choosing the type of filter at the NVG based on "how much color is needed;" (4) that the "good coloured image" was produced by filtering the display or reducing the red level (*i.e.*, "splitting the red color band"); and (5) "how the system may be applied to liquid crystal displays." *See* Pl PT Op Def at 70-73.

L-3 counters that the obviousness inquiry does not require an inventor to combine the elements and that Honeywell is attempting to turn the obviousness inquiry into an anticipation inquiry. *See* L-3 Def Reply at 32 ("Thus, Honeywell asserts that if the invention is not fully implemented in the prior art it is non-obvious. Again, this is a discussion of anticipation, not obviousness."). L-3 further argues that the inventor of the '914 patent never actually combined LCDs with complementary filtering. *Id.* at 33 ("While Honeywell criticizes BOEHM and other references for failing to combine complementary filtering and LCDs like UCHIDA, it should be noted that such a combination was never made by the '914 inventor[.]") (citing DE 54 at 441 (Cohen Dep.)). As for Honeywell's separate red, green, and blue filter argument: "[al]though BOEHM does not describe the green and blue filter specifically, it suggests their combination with its disclosure

by referencing LCDs specifically" and "[a] person of ordinary skill in the art then would be motivated to use LCDs as a display, and make those LCDs NVG compatible[.]" *Id*. BOEHM also passes a "narrowband of the red color band." *Id.* at 34-38. In addition, BOEHM discusses viewing a cockpit display with a naked eye. *Id.* at 40 (citing DMX 4 at D000588-89 (stating that "pilots have . . . developed helmet-mounted NVG. The reason for this development is that the pilot can look around the goggles into the cockpit and onto the instrument panels in front of him with the 'naked eye.'")). BOEHM, however, did not specifically disclose that a 570 nm, 590 nm, or 630 nm filter could be used depending on the color needed, because one skilled in the art, in 1985, would understand how to use the various filters. *Id.* at 40. On the other hand, BOEHM discloses splitting the red color band, as it "describes filtering the NVGs" and "filtering cockpit illumination, such as LCDs." *Id.* at 41 (citing DMX 4 D000590, 600). Therefore, L-3 concludes that BOEHM does not need to describe how the system works with LCDs, because "[t]he Court need only determine whether a person of ordinary skill in the art could apply BOEHM's reference to LCDs such as UCHIDA, and combine them." *Id.*

The Government adds that VERNEY, as interpreted by Mr. Tannas, also renders claim 2 obvious.[30] *See* Gov't PT Def at 32 ("Combining [Tannas's] admissions with the teachings of VERNEY leads to the conclusion that claim 2 also would have been obvious[.]"); *see also* L-3 Def Reply at 34-38. VERNEY discloses the claim 2 Preamble, claim 2(a)(3), and claim 2(b), and Mr. Tannas's testimony discloses all the elements of claim 2. *See* Gov't PT Def at 33-34 (chart). In fact, Mr. Tannas's testimony characterized the "geniusness," or what separates the '914 patent from the prior art, as "the interaction of the 'third filter' and 'fourth filter.'" *Id.* at 35 (citing TR 1352) (Tannas) ("So the geniusness of it comes into that hint - that little clue that says there's going to be success here if you do this little trick."). VERNEY also discloses the "geniusness" of the interaction between the third and fourth filter, making claim 2 a "combination."

Honeywell counters that claim 2 "would not have been obvious in view of VERNEY alone," because: (1) that argument is not supported by Dr. Task; (2) VERNEY fails to suggest separate filtering of red, green, and blue and does not suggest a fourth filter at the NVG; and (3) VERNEY "takes a different approach," as it teaches "the conventional wisdom that 'red or white integral lighting systems cannot be activated while the pilot is using NVGs due to their adverse interaction' and therefore integral lighting must be corrected to be 'blue-green in color' with 'minimal energy between 600 and 950 nanometers.'" Pl PT Op Def at 60-64 (citing DE 511 at GVT009-0773, 0780; PTX-834 ¶ 427-29; TR 1166 (Tannas)). Instead, VERNEY teaches a "combination of an infrared blocking filter and dimming" and that "red light should 'stand[] out in the NVG,'" instead of blocking the red light from the NVG. *Id.* at 64-65 (citing DE 511 at GVT009-0780; TR 1162-63 (Tannas)). Consequently, one of ordinary skill in the art, in 1985, would understand that "the red warning light would have to be dimmed to a level where it is not perceptible to the human observer."

[30] The Government also argues that the REETZ THESIS combined with UCHIDA or STOLOV would make claim 2 obvious. *See* Gov't PT Def at 27. The court has already determined that the REETZ THESIS is not prior art.

Pl PT Op Def at 65 (citing TR 1396-97 (Tannas); *see also* TR 1694 (Task) ("I don't know how far you would have to dim it down" in order not to adversely affect the performance of the NVGs.)).

Therefore, when the patent-in-suit is viewed as a whole, the Government and Defendant-Intervenor's prior art combinations fail to disclose: "a display that is both full color and NVG compatible; a filter at the display that passes a narrowband of the red color band, and a filter at the NVGs that blocks that narrowband; and an NVG compatible display having separate filters for red, green and blue." Pl PT Op Def at 22. In 1985, no one "achieved night-vision goggle compatibility with a full color display." *Id.* at 18 (citing TR 281-82) (Dunn) (testifying that he was not aware of anyone who had achieved this compatibility); *see also* SA TR 883-84 (Reetz) (HONEYWELL COUNSEL: "In late 1985 and early 1986, just at the time the original spec came out, did you use complementary filtering on full color displays in that time period?" REETZ: "I'm going to say no, we did not."); *see also* DE 500 ¶ 32 (Task) ("The court may wonder, if it was so obvious to apply known complementary filtering techniques to color CRTs and LCDs in 1985, why is there no such application shown in the prior art?").[31]

In addition, Honeywell asserts that BOEHM and VERNEY fail to suggest any method for making a "display NVG compatible while retaining its full color capability." Pl PT Op Def at 19. "[P]lacing a full color display in a cockpit" is an "advantage of the '914 invention that distinguishes it from the prior art." *Id*. (citing *United States* v. *Adams*, 383 U.S. 39, 48 (1966) (stating that "the fact that the Adams battery is water-activated *sets this device apart from the prior art*" even though "[i]t is true that claims 1 and 10 . . . do not mention a water electrolyte") (emphasis added)). The prior art also does not disclose "a narrowband of the red color band emitted by the display that is blocked at the NVGs," because the prior art does not disclose how this complementary filtering technique should be implemented. *Id.* (citing PTX 834 ¶ 243) ("[N]one of the references relied upon by Task discloses or suggests the way to achieve an NVG compatible full color display devised by the inventors, namely . . . splitting the red color band[.]"). In other words, "[t]he claimed 'third filter' . . . is designed, unlike the prior art, to work in combination with an appropriate full color display light source, to allow a narrowband of the red color band to pass through." *Id*. at 21. Therefore, the "invention does not simply unite old elements with no change in their respective

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[31] Dr. Task anticipated this question in his direct testimony:

> The answer is that there were few full color displays and no full color LCDs and CRTs in cockpits in 1985. The existing aviator NVGs and practical choices regarding daylight readability of the displays or the cost to retrofit existing aircraft played significant roles in the pace of the introduction of NVGs and full color cockpits. In addition, the military specification process to govern procurement of compliant military cockpits and goggles required consensus and coordination among the military branches. These, among other reasons discussed below, explain the pace of the military's use of NVGs with full color CRTs or LCDs.

DE 500 ¶ 32.

functions." *Id.* (citing *KSR*, 127 S. Ct. at 1739). Moreover, Honeywell contends that "[n]either the Government nor L-3 points to anything in the prior art or elsewhere suggesting the use of separate filters for red, green and blue for making an NVG compatible full color display." *Id.* In sum, Honeywell's arguments are that the prior art combinations fail to disclose: "a display that is both full color and NVG compatible; a filter at the display that passes a narrowband of the red color band; and a filter at the NVGs that blocks that narrowband; and an NVG compatible display having separate filters for red, green and blue." *Id.* at 22.

L-3 responds that the court's claim construction only requires "[a] device that may be used together or in combination with optical filters and shows or exhibits at least *one color* perceptible to an observer[.]" *See* L-3 PT Def at 20 (quoting *Honeywell II,* 66 Fed. Cl. at 444) (emphasis added). Honeywell does not contest the court's claim construction, but counters that the Government conceded that the invention was "placing a full color display in a cockpit." *See* Pl PT Op Def at 19 (quoting Gov't PT Def at 20). Moreover, Honeywell's arguments, that a NVG compatible full color display was not achieved in 1985 and neither BOEHM nor VERNEY discloses a NVG compatible full color display, are not relevant to the court's obviousness analysis. *See* L-3 Def Reply at 26 ("Whether a prior art reference contains all the elements of a claim is the analysis of the anticipation defense under § 102 rather than obviousness under § 103."); *see also id.* (Reetz and Dunn, however, "were noting simply that no one was practicing the invention on a full color display, but they did not suggest that a person of skill in the art would not find complementary filtering -- of full color displays -- obvious."). TRIMMIER, however, "suggests a 'full color (NVG compatible)' display" and the GERMAN PATENT "provides a precise formula for making a display NVG compatible at any wavelength, including wavelengths for full color displays." *Id*. (citing DE 500 ¶¶ 134-35; DE 505 at GVT007-0926; DE 514 at GVT018-1667).

Both the Government and L-3 contend that Honeywell's arguments are simply combinations of elements of claim 2. *See* Gov't Def Reply at 10-11 ("[T]he second two [arguments] are actually combinations of two or more elements of claim 2 . . . [t]he first 'difference' . . . appears to be the title of the patent, as opposed to elements of claim 2."); *see also* L-3 Def Reply at 27 ("[E]ach of Honeywell's proposed 'missing elements' is actually a combination of two or more elements."). The essence of Honeywell's argument is that there is no *one* piece of prior art that discloses *multiple* elements of the '914 patent, instead of arguing that the prior art could not be combined to achieve the invention in the '914 patent. *Id*. As such, Honeywell's argument is not consistent with *Graham*, "which requires a court to determine which elements are present in the references and how it would be obvious for a person of skill in the art to combine those references." *Id.* (citing *KSR*, 127 S. Ct. at 1734 (quoting *Graham*, 383 U.S. at 17-18)); *see also* Gov't Def Reply at 11 ("[In *KSR*], [t]he Supreme Court found that the difference between the prior art and the claimed invention was merely that the 'puzzle pieces' in the prior art had not been combined to reach the claimed invention." (citing *KSR*, 127 S. Ct. at 1742)). L-3 adds that "complimentary filtering" also was not disclosed by a sole prior art reference, because: "(1) the initial compromise was to allow greater NVG abilities by reducing color in the cockpit; (2) most cockpits were not using color displays such as LCDs or CRTs at the time; and (3) the full color displays at the time had difficulties with daylight readability." L-3 Def Reply at 26-27 (citing TR 362-63 (Reetz); TR 233, 239-244 (Dunn)).

(2) The Court's Resolution.

BOEHM teaches all of the elements of claim 2, except for a "plurality of filters at the local color display." *See* Section II.C.3.d., *supra*. BOEHM also teaches "complimentary filtering" and it is evident that color displays described in UCHIDA and STOLOV could have been considered for use in aircraft prior to 1985. *See* DE 515 at GVT009-0486 (as of 1981, LCDs were "increasingly being used in portable instruments"). The fact that BOEHM did not apply complementary filtering to full color displays is not dispositive, however, since the trial court may:

> look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, *all* in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.

KSR, 127 S. Ct. at 1740-41 (emphasis added). Accordingly, in this case, the court discerns little difference between the prior art combinations and the claimed invention "as a whole."

Moreover, combining BOEHM with UCHIDA or other prior art to demonstrate the obviousness of using red, green, and blue filters does not require "hindsight reconstruction." *See* Pl PT Op Def at 67 ("But it would be clear error to combine these references merely because 'the court requires more' than just BOEHM (DMX-4) to find all elements of the claim." (citing *Grain Processing Corp.* v. *Amer Maize-Prod. Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988) ("Care must be taken to avoid hindsight reconstruction by using 'the patent in suit as a guide through the maze of prior art references[.]'" citation omitted)); *see also id.* at 28 ("The Government's analysis is not based upon 'ordinary' skill and creativity that existed in 1985, but is aimed at reconstructing claim 2 of the '914 patent through hindsight."). Accordingly, the court has determined that BOEHM disclosed all of the elements of claim 2 of the '914 patent, except for the use of red, green, and blue filters. The court also has determined that UCHIDA and STOLOV disclosed the blue and green filter requirements of claim 2(a), and that BOEHM, the GERMAN PATENT, and VERNEY disclosed the requirements of claim 2(a)(3). More importantly, the identification of the plurality of filters was not the "genius" or inventive aspect of the '914 patent. As Mr. Tannas testified:

> MR. TANNAS: Engineers and one skilled in the art know that they could put filters on anything at any time in any way. So I put that question in that category. It's not a teaching or a fundamental issue. And all of the experiments that were going on, everybody was putting different kinds of filters on different kinds of things, but apparently they didn't feel it was necessary in the Reetz study. If it were of interest, they would have done it. But

apparently it wasn't of interest or of concern in the Reetz study because it was so obvious that anybody could put filters on any of them.

TR 1080.

* * *

GOVERNMENT COUNSEL: Now, do you know whether the teachings, as you have opined about them, of the '914 patent, [c]laim 2, could have been practiced by one skilled in the art in -- or prior to October of 1985 with off-the-shelf available technology?

MR. TANNAS: I would -- no. It's my opinion that all of those filters that were used were available someplace in the industry. The patent didn't invent the filter.

TR 1347.

* * *

MR. TANNAS: I could go on further. When you ask about nothing new, the inventor didn't invent night vision goggles. He did not invent full color displays. He didn't invent red, blue and green primaries. He invented a system to make them work together in a unique way better than anyone else had ever done.

L-3 COUNSEL: Well, the system -- by the way, what was it unique about the way it's done? Is it what you've described as these especially sharp filters?

MR. TANNAS: *He was able to filter the red color band -- split the red color band so that there was enough red so that the full color display could still act as a full color display when viewed by*

> *the unaided eye and that the night vision goggle would* [*be*] *satisfactory to its vision requirements.*

TR 1348 (emphasis added).

Therefore, the court has determined that Government and Defendant-Intervenors have established by clear and convincing evidence that prior art combinations, in 1985, disclosed all the elements of claim 2 of the '914 patent when viewed as a whole.

(b) Obvious To Combine The Prior Art.

(1) The Parties' Arguments.

Next, the Government and L-3 argue that it would have been obvious to one of ordinary skill in the art, in 1985, to combine the prior art references to solve the problem addressed by the '914 patent. *See* Gov't PT Def at 18-26; *see also* L-3 PT Def at 9-12, 37-42. The Government lists each of the steps that one skilled in the art in 1985 would take to combine the elements in claim 2, tracking Dr. Task's testimony. *See* Gov't PT Def at 20-21 ("The testimony at trial established that the skilled artisan would investigate several 'known options,' when faced with the design need of placing a full color display in a cockpit, and making the display compatible with a pilot's night vision goggles[.] . . . This is exactly the thought process mirrored by Dr. Task in his direct testimony. Dr. Task selected several 'primary references' that taught complementary filtering on cockpit displays.") (citing DE 500 ¶¶ 100-172). One skilled in the art at that time would undertake the following steps:

> 1. The artisan would study various known technologies for creating a full color display;
>
> 2. He would apply to these known technologies the standard technique for night vision goggle compatibility, the complementary filtering method described throughout the prior art; and
>
> 3. The artisan would choose appropriate filters to make complementary filtering work with the displays being studied, to produce the desired full color display.

Id. (citing DE 500 ¶¶ 100-172).

Likewise, one skilled in the art, in 1985, would understand complementary filtering. *See* L-3 PT Def at 9 ("In the early 1980s those working in the field were very familiar with complementary filtering and its ability to reduce interference from cockpit lighting." (citing TR 425 (Reetz); TR 1539-40 (Task))); *see also* Gov't PT Def at 22 ("It is undisputed that a person of ordinary skill in 1985 would also have been aware of complementary filtering as a technique for making light sources

compatible with night vision goggles."). One skilled in the art, in 1985, also would rely on disclosed methods of complementary filtering. *See* L-3 PT Def at 37-38 ("[Dr.] Task testified that at least eight different combinations of those references could be used to satisfy the elements of [c]laim 2, [relying on techniques] and the disclosure of[:] VERNEY (DE-511)[;] BOEHM (DMX-4)[;] or TRIMMIER (DE-514) for motivation to modify or combine the references."); *see also* Gov't PT Def at 23 ("The artisan, investigating this technique, would find the numerous references cited by Dr. Task that thoroughly discuss the technique and methods[.]" (citing DE-500 ¶¶ 91-98; DE-504-10; DE-513; DE-521; DE-301; DMX-4)).

At trial, each of the Government's witnesses testified that, in 1985, they were aware of using complementary filtering to reduce lighting interference. *See* TR at 141, 148-50 (Bradford); 261-63 (Dunn); 425 (Reetz); DE 500 ¶¶ 21, 38, 1539-40 (Task). In particular, L-3 relies on a memo written by the inventor of the '914 patent to demonstrate "the extensive community knowledge of this complementary filtering technique, including splitting the red band, and how red wavelengths were compatible with NVGs in cockpits, even a year prior to the claimed invention date." L-3 PT Def at 10. For example, at a conference in 1984, Mr. Cohen was told that "night vision systems 'should not remove all red,' that Sikorsky[32] was using a system with 'IR suppressed red lights which are compatible with NVG,' and that WAMCO could provide Cohen with 'NV filters . . . which will provide some red with NV compatibility.'" *Id*. (citing DE 57 H03235 (Cohen Memo)).

L-3 adds that the aircraft technical community, in 1985, recognized an "engineering trade off between maximizing goggle performance and allowing in more colors." L-3 PT Def at 10 (citing TR 1547-50, 1597, 1698 (Task)); *see also* L-3 PT Def at 11 ("Allowing more red light in the cockpit was simply an engineering choice between night vision sensitivity and the need for red lighting." (citing TR 362 (Reetz); TR 1597, 1698 (Task))). Therefore, the aircraft technical community did not decrease NVG sensitivity at that time, because there were "very few, if any, full color displays in military aircraft as Honeywell has defined them, *i.e.*, displays using LCDs." *Id*. at 11 (citing TR 361 (Reetz); TR 978 (Lawrence); PTX 834 ¶ 252 (Tannas)). Prior to 1985, full color displays were not used because of daylight readability issues. *See* Gov't PT Def at 21 (citing TR 242-45 (Dunn) ("[B]right sunlight shining on cockpit displays at high altitude tended to 'wash out' the color displays and make them unreadable.")); *see also* L-3 PT Def at 12 ("The technical hurdle that prevented full color displays from being used in the military cockpit was not NVIS compatibility, it was making the displays daylight readable, a technical issue *not addressed* by the claimed invention." (emphasis added) (citing TR 233 (Dunn))). Moreover, even after the visibility problem was addressed, aircraft technical "engineers quickly integrated NVGs by simply measuring the required wavelength cutoff needed and ordering the filters off the shelf." L-3 PT Def at 12 (citing DE 500 at 93-94; TR 262-63 (Dunn); DE 57 H03235 (Cohen Memo)).

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[32] Although not in the record, "Sikorsky Aircraft Corporation is a world leader in the design, manufacture and service of military and commercial helicopters; fixed-wing aircraft; spare parts and maintenance, repair and overhaul services for helicopters and fixed-wing aircraft; and civil helicopter operations." About Sikorsky, http://www.sikorsky.com /sik/about_sikorsky /index.asp.

Finally, the Government argues that one skilled in the art, in 1985, would be able to select a third and fourth filter to achieve a full color display compatible with NVGs. *See* Gov't PT Def at 24. As such, Mr. Bradford testified that he tested filters with cut-offs between 600 nm and 900 nm and that selecting the "right" filters was a matter of "mathematics and physics." *See* TR 147-48, 263 (Dunn). Moreover, Mr. Tannas testified that:

> • The use of filters with NVGs and displays was well within the level of ordinary skill in the art. *See* TR 1080 ("Engineers and one skilled in the art know that they could put filters on anything at any time in any way.")
>
> • Using filters to filter color bands other than red was known in 1985. *See* TR 1057, 1059-60 (admitting that filtering of green and blue color bands was known).
>
> • The filters as used in claim 2 were widely available to the industry as off-the-shelf technology. *See* TR 1347 ("The patent didn't invent the filter.")
>
> • There was nothing different about filtering the red color band, as opposed to other color bands. *See* TR 1347 (L-3 COUNSEL: "And there's noting scientifically different about filtering a portion of the red color band from, for example a portion of the blue color band, correct? MR. TANNAS: "No.").

Therefore, the Government concludes that the '914 patent did not need to disclose how to select the appropriate filters. *See* Gov't PT Def at 25. As Mr. Tannas testified:

> L-3 COUNSEL: Well, [the patent] tells you what the goal is, which is splitting the red color band, as you said, but it doesn't tell you how to make a display system and a filtering system do that, does it?
>
> MR. TANNAS: No, it does not. And I don't think it has to. One skilled in the trade, as defined by the courts, could pick this up and do it, I believe firmly.

TR 1354.

Honeywell counters that "ordinary skill in the art in 1985 would not have been sufficient to bridge the gap between the prior art and the patented invention." *See* Pl PT Op Def at 27. More importantly, the Government's analysis does not comply with *Graham*, because "the Government supplants [the obviousness inquiry] with its own improper and unsupported three-part inquiry" that relies on hindsight. *Id*. at 27-28 ("For example, the Government provides no explanation for why one of ordinary skill in the art would suddenly decide, breaking away from the prior art, that the red color band should be filtered to pass a narrowband of the red color band."). The filters known, in 1985, would "not have passed a narrowband of the red color band." *Id*. at 28. Therefore, the Government and Defendant-Intervenors provided evidence only of light being transmitted through

a filter by an incandescent bulb, while Honeywell was able to demonstrate that "the prior art complementary filters would not pass a 'narrowband of the red color band[,]' when combined with a full color display." *Id*. at 29 (citing PTX 834 ¶¶ 324, 397; TR 1149-50 (Tannas) (testifying that if CS-4-94 filter were applied to a full color display in 1985, "[i]t [would] greatly diminish[] the red and change[] the whole character of the display . . . you would have goggle compatibility you just wouldn't have a full color display anymore")). Moreover, the BG-7 transmission spectrum is not relevant, because the display "merely shows the transmission spectrum for the filter, not the spectrum of light emitted by the display." *Id*. at 30. Finally, Honeywell argues that one skilled in the art, in 1985, would not have chosen the third and fourth filters of claim 2, because: "there is no evidence that one of ordinary skill in the art would have used filters having different functionality than those described in the prior art references." *Id*. at 31. One of ordinary skill in the art, in 1985, would not have understood that "a full color display could be achieved by using a filter that passes a narrow band of the red color band." *Id*. at 36. Moreover, "[c]ontemporaneous and prior art documents indicate that there was a great deal of uncertainty surrounding whether it would have been possible to make a full color display NVG compatible while retaining its full color capability." *Id*. at 39.

(2) The Court's Resolution.

To assist the court in viewing the invention as a whole through the eyes of the person of ordinary skill in the art, the United States Court of Appeals for the Federal Circuit developed the TSM test. *See In re Bergel*, 292 F.2d 955, 956-57 (C.C.P.A. 1961) ("The mere fact that it is possible to find two isolated disclosures which might be combined in such a way to produce a new compound does not necessarily render such production obvious unless the art also contains something to suggest the desirability of the proposed combination."). In *KSR,* the United States Supreme Court recently declined to set aside the TSM test, but held that a "rigid and mandatory" application of the TSM test is "incompatible" with precedent. *See KSR*, 127 S. Ct. at 1741. The Court observed that:

> a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. Although common sense directs one to look with care at a patent application that claims as innovation the combination of two known devices according to their established functions, *it* [*also*] *can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does*. This is so because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.

Id. (emphasis added).

Additionally, in considering whether it would be obvious, in 1985, to one of ordinary skill to combine the prior art references discussed herein, the court must avoid hindsight reconstruction

but should not consider whether one of ordinary skill in the art, in 1985, starting with a "blank slate," would have elected to use the teachings of BOEHM and VERNEY in conjunction with UCHIDA or STOLOV. *See KSR*, 127 S. Ct. at 1744 ("The Court of Appeals considered the issue too narrowly by, in effect, asking whether a pedal designer writing on a blank slate would have chosen both Asano and a modular sensor similar to the ones . . . disclosed in the '068 patent."). Instead, the court must determine whether one skilled in the art, in 1985, "facing the wide range of needs created by developments in the field of endeavor," would have combined the filters. *See KSR,* 127 S. Ct. at 1744; *see also In re Translogic Tech., Inc*., 504 F.3d 1249, 1257 (Fed. Cir. 2007) ("[A]s the Supreme Court suggests, a flexible approach to the TSM test prevents hindsight and focuses on evidence before the time of invention.").

Therefore, the court is required to determine whether it would have been obvious to a person "knowledgeable about night vision compatible aids, compatible instrument and panel lighting, and manufacturing displays for military cockpits" to combine the prior art elements in a manner to achieve the solution of the '914 patent. *See Honeywell II*, 66 Fed. Cl. at 428; *see also KSR*, 127 S. Ct. at 1744 ("The proper question to have asked was whether a pedal designer of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading Asano with a sensor.").

The court is aware that: "the interaction of multiple components means that changing one component often requires that others be modified as well." *KSR*, 127 S. Ct. at 1744. In this case, the first component requiring change, in 1985, was the full-color LCD look down display. *See* DE 500 ¶ 205 ("When LCD displays were deemed daylight readable and functional for cockpit use, the same logic was applied to place an NVIS filter to reduce the longer wavelengths of red and infra-red that interfered with the NVGs."). After daylight readability issues were resolved, full color displays, *i.e.*, LCDs, could be used in aircraft cockpits. *Id.*; *see also* DE 515 at GVT009-0486 (stating that LCDs were "increasingly being used . . . in portable instruments"). Therefore, the record evidences that visibility and other military requirements were the driving forces for not using full color displays and red lighting in aircraft cockpits. *See* TR 247 (Dunn) (GOVERNMENT COUNSEL: "And did monochrome displays present the same daylight readability issues as full color displays?" MR. DUNN: "Well, no, they didn't, because monochrome CRTs and certainly the ones in the aircraft did not contain shadow mask."); *see also* DMX 4 at D000597 ("[A] blue/green illuminated cockpit is not as easy to detect[.]"). For an inventor faced with the problem of integrating a full color display into an NVG-compatible cockpit, the issue would be how to filter the light that interferes with the function of the NVGs. Both BOEHM and the GERMAN PATENT demonstrate the concept of using a combination of filters at the display and at the NVGs to allow an operator to "look around" the NVG. *See* DMX 4 at D000589 (diagram); *see also id.* at D000607 ("NVG[s] were successfully tested with a colour MFD (HDD) and a CGI simulator."); DE 505 at GVT007-0922 ("To observe a luminous indicating instrument it is suggested that a first filter be placed in front of the instrument and that first filter have a long-wave blocking limiting frequency that lies below the short-wave blocking limiting frequency of a night-vision device set in front of the second filter."). Therefore, Honeywell's argument is reduced to whether, in 1985, one skilled in the art could: "split the red color band so that there was enough red so that the full color display could still act as a full color

display when viewed by the unaided eye and that the night vision goggle would [be] satisfactory to its vision requirements." TR 1348 (Tannas). Honeywell proffered a chart and testimony to demonstrate that the Glendale Green filter, the REETZ THESIS filter, the LLOYD filter, and the BOEHM filter did not specifically disclose filters that can "split the red color band." *See* PTX 916 (chart); *see also* PTX 834 ¶ 244. Honeywell, however, neglected to mention VERNEY and the GERMAN PATENT. *See* PTX 834 ¶¶ 243-45. VERNEY disclosed a filter nearly identical to the one found in the infringing CMFD. *See* DE 500 at 63 (chart); *see also* DE-526-19c (chart). In addition, Dr. Task confirmed that the GERMAN PATENT "provides one with skill in the art a recipe of how to design the two filters, their allowed passing and blocking wavelength bands and the amount of passing or blocking required, in order to successfully apply the invention." *See* DE 500 ¶ 134. In response, Mr. Tannas testified only that "filter B is so broadly defined, it is impossible to determine what wavelengths are passed and blocked." PTX 834 ¶ 385.

Assuming, *arguendo*, that VERNEY and the GERMAN PATENT did not disclose how to "split the red color band," the record evidences that one skilled in the art, in 1985, could have determined which filters to use. First, Mr. Tannas admitted that, after one skilled in the art, in 1985, identified the need to split the red color band, determining the appropriate filters to use also would be known. *See* DMX 4 at D000590 (Figure 3). In fact, such filters were available on the market at that time. *See* TR 1347-49. Mr. Tannas also confirmed:

> L-3 COUNSEL: Well, the patent doesn't state anything about how steep or sharp the filter has to be, does it?
>
> MR. TANNAS: No, it does not. It just says split the red color band and divide it up between the night vision goggle and the viewer. So the [genius] of it comes into that hint -- that little clue that says there's going to be success here if you do this little trick. And sometimes these things really do boil down to just a little minutia but it's minutia that pushed the industry over so that they could make them fully compatible with full color displays.

TR 1352.

* * *

> L-3 COUNSEL: The claim -- the patent doesn't say how steep the filter has to be, it doesn't specify filter, correct?
>
> MR. TANNAS: No. I think it's up to the person implementing the concept to make it as steep as he needs to.

L-3 COUNSEL: It doesn't say how much gap there should be between a red right pass or block, correct?

MR. TANNAS: No. That would depend heavily on the light source -- where the energy was in the light source.

L-3 COUNSEL: And it doesn't say anything about where to draw the cutoff point in the red spectrum, correct?

MR. TANNAS: No, it doesn't. So now you have to go on designing the thing. So it really doesn't tell you how to design it.

L-3 COUNSEL: It doesn't tell you how to make the device that is the subject of the claims, does it?

MR. TANNAS: It tells you how to make it. It says split the red color band. Now, the detail of implementing that is another step. And then after you do that, then you go to another step, divide the filters. And after you do that, you go into the laboratory and do some tests. There's quite a bit of work to do after this concept is put forward.

L-3 COUNSEL: Well, it tells you what the goal is, which is splitting the red color band, as you said, but it doesn't tell you how to make a display system and filtering system to do that, does it?

MR. TANNAS: No, it does not. And I don't think it has to. One skilled in the trade, as defined by the court[], could pick this up and do it, I believe firmly.

TR 1353.

Therefore, the court has determined that it would have been obvious to one of ordinary skill in the art, in 1985, to combine the prior art to achieve the claimed invention. As Dr. Task explained, one skilled in the art, in 1985, would first study various known technologies for creating a full color display. *See* DE 500 ¶¶ 100-72. This analysis would lead to the understanding that CRTs or LCDs, as disclosed in UCHIDA and STOLOV, could be used in cockpits. Then, one skilled in the art would apply complementary filtering, as described in various prior art references, including VERNEY and the GERMAN PATENT. *Id.*; *see also* DE 511 at GVT009-0782 ("Perhaps an approach to retain color CRTs while using NVGs might be to block some of the infrared emissions similar to the approach used in the caution and warning lights [(complementary filtering)]."). In addition, the appropriate filters selected would make complementary filtering work with the displays being studied, to produce the desired full color display. *See* DE 500 ¶¶ 100-72; *see also* TR 1352-54 (Tannas). Moreover, the

court also rejects Honeywell's argument that the Government and Defendant-Intervenors improperly used a spectral analysis with an incandescent bulb, instead of a full color display. As Mr. Tannas testified, selecting appropriate filters "would depend heavily on the light source -- where the energy was in the light source," and "[o]ne skilled in the trade, as defined by the courts, could pick this up and do it." TR 1352-54. In addition, the court rejects Honeywell's contention that the prior art does not support splitting the red color band, when considering the "interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art[.]" *KSR*, 127 S. Ct. 1740-41. Again, as Mr. Tannas testified:

GOVERNMENT COUNSEL:	And so one of ordinary skill in the art would then look for other filters if they wanted to make that display compatible with goggles and still retain the full color. Wouldn't they?
MR. TANNAS:	*I don't know what goes in the mind of an inventor.*
GOVERNMENT COUNSEL:	Well, Mr. Tannas --
MR. TANNAS:	It's not obvious that it could even be achieved. So there's quite a few summary statements by quite a few of the references that suggest that to get full color display compatibility with a night-vision goggle, you should turn off the red, cover up the red, turn down the red. There's no suggestion at any place *in the literature* that you could possibly share the red and have enough red to keep and maintain a full color display, while at the same time being compatible with the goggle. So that is the genius[ness] of the invention.

TR 1150 (emphasis added).

In this case, the prior art described specific design issues and limitations in cockpits. The prior art, however, did not specifically address NVG compatibility with a full color display like the '914 patent. *See* DMX 4 at D000597 ("American experiments (ref. 9) have shown that blue/green illuminated cockpit is not as easy to detect as an incandescently or red illuminated cockpit."); *see also* DE 506 at GVT009-0472 ("The desired night flying configuration was for the pilot to wear the [NVGs] for piloting the aircraft while the copilot did not wear goggles so that he could monitor the aircraft instruments[.]"); DE 511 at GVT009-0773 (indicating that the research was for warning lights and not a full color display); DE 514 at GVT018-1663 (stating that it may be "tough to achieve

sunlight viewability" using a LCD, without mention of NVG compatibility as an implementation issue).

The court is cognizant that often "market demand, rather than scientific literature, will drive design trends." *See KSR*, 127 S. Ct. at 1741. In this case, BOEHM demonstrates that "market demands," in fact, may have influenced the military not to use red in the cockpit, even though it was scientifically possible. *See* DMX 4 at D000597. As BOEHM disclosed:

> *A brightly-lit cockpit is to be avoided in military applications*. A foe can detect a brightly illuminated helicopter very well with and without NVG. American experiments (ref. 9) have shown that blue/green illuminated cockpit is not as easy to detect as an incandescently or red illuminated cockpit.

DMX 4 at D000597 (emphasis added); *see also* TR 1375 (Tannas) ("[Y]ou may be seen by your adversaries, so you want to keep all the red down if only for that purpose, to be clandestine."). Therefore one skilled in the relevant art, in 1985, who was aware of BOEHM, but not constrained by the unique requirements of the military, may have been "prompted" to "combine the elements in the way [claim 2] does." *See KSR*, 127 S. Ct. at 1741 ("[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."); *but see* TR 361 (Reetz) ("[T]he jet air crews had a different opinion than the helicopter air crews about the elimination of red, and their conclusion was we needed to keep red.").

By the mid-1980's, however, there was a clear demand by the military for a full color display in aircraft. *See* DE 511 at GVT009-0782 ("[*F*]*uture* aircraft will most likely make use of CRT's while having to emit light that is compatible with NVGs.") (emphasis added). This demand was the driving incentive for the development of NVG-compatible full color displays. In addition, the record evidences that it would be obvious for one skilled in the art, in 1985, to combine the prior art in the ordinary course. As VERNEY recognized:

> LHX and future aircraft will most likely make use of CRT's while having to emit light that is compatible with NVGs. In examining the emitted spectrum of a CRT it is noted that the spectral content consists of narrow band emissions. Preliminary tests show that the NVGs can tolerate narrow band emissions for all colors of light. Perhaps an approach to retain color CRTs while using NVGs might be to block some of the infrared emissions similar to the approach used in the caution and warning lights. A second approach may be to disable the red . . . [o]ther areas include plasma displays, LED matrices, liquid crystal and micro-encapsulate electroluminescence.

DE 511 at GVT009-0782.

Likewise, LLOYD disclosed that "[t]he only feasible solution to this problem is to use the complementary filter lighting system[.]" DE 521 at GVT008-1983. Although the prior art identifies

options different from claim 2, complementary filtering was well known in 1985 and one skilled in the art logically would explore complementary filtering to make full color displays NVG compatible. *See KSR*, 127 S. Ct. at 1742 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, . . . the fact that a combination was obvious to try might show that it was obvious under § 103."); *see also Ortho-McNeil Pharm., Inc*. v. *Mylan Lab., Inc.*, 2008 WL 834402, at *4 (Fed. Cir. March 31, 2008) ("[KSR's design need] posits a situation with a finite, and in the context of the art, small or easily traversed, number of options that would convince an ordinarily skilled artisan of obviousness."). Therefore, Dr. Task testified that once LCDs were integrated into cockpits, inventors were able to apply complementary filtering to make them NVG compatible. *See* DE 500 ¶ 205 ("When LCD displays were deemed daylight readable and functional for cockpit use, the same logic was applied to place an NVIS filter to reduce the longer wavelengths of red and infra-red that interfered with the NVGs.").

Because complementary filtering was a known technique, in 1985, that could be used to filter any type of display (*see, e.g.* DE 505) it would have been obvious to apply this technique to allow the use of red in the cockpit. *See KSR*, 127 S. Ct. at 1740 ("[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . . [A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions."). Consequently, applying complementary filtering to address red light compatibility with NVGs was predictable, in 1985, and not a genuine innovation. *See Astrazeneca AB* v. *Mylan Labs., Inc.* (*In re Omeprazole Patent Litig*.), 490 F. Supp. 2d 381, 534 (S.D.N.Y. 2007) ("Here, by contrast, there were 'thousands and thousands of permutations and paths' facing a person of ordinary skill trying to formulate omeprazole. . . . The Patents are genuine innovations, not predictable upgrades."). The decision to use NVGs in fixed-wing aircraft created a market that would incentivize one of ordinary skill in the art to use complementary filtering to filter the red color band. *See* TR 361-62 (Reetz) ("[T]he F-18 program office came back to the tri-service community and said, can you rewrite the specification to allow the use of red warning lights? And that's what we worked on, and we came to the conclusion, yeah, we could do that, but in order to do that, you're going to have to give up goggle performance.").

For these reasons, the court has determined that, for one skilled in the art, in 1985, motivated by the development of LCDs in a fixed-wing aircraft cockpit and the military's need to make such displays compatible with NVGs, combining the prior art would have been obvious.

iii. Teaching Away.

A reference "may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *see also KSR*, 127 S. Ct. at 1740 ("The Court relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery

of a successful means of combining them is more likely to be nonobvious.") (citing *Adams*, 383 U.S. at 51-52).

Honeywell argues that prior to the issuance of the '914 patent there "was a belief that red light had to be eliminated to make the cockpit NVG compatible." Pl PT Op Def at 45 (citing PTX 834 ¶ 417 ("A concept that pervaded the mindset of those working to solve the NVG compatibility problem was that red light cannot be tolerated in an NVG compatible cockpit.")); *see also* Pl PT Op Def at 45 (citing six prior art references "teaching that red light is [not] compatible with NVGs") (citing PTX 834 ¶ 418; DE 146 at GVT019-1642; DE 301 at GVT018-1045; DE 324 at GVT012-2378; DE 524 at GVT008-0846; DE 506 at GVT009-0474; DMX 4 at D000597). Prior to 1985, the United States Army spent $52 million to eliminate red light from aircraft cockpits. *See* Pl PT Op Def at 46 (citing TR 194, 210 (Bradford) ("[R]ed lighting . . . was taken out of the aircraft so that it would meet the requirements to work well with the goggles.")). As a result, the military issued MIL-L-85762, a specification that "effectively prohibited the use of red light and full color displays with NVGs." Pl PT Op Def at 46 (citing DE 146; PTX 12 (MIL-L-85762); DE 500 ¶ 40).

The Government and Defendant-Intervenors respond that the prior art references do not teach the removal of all red, but "simply the *reduction* of red." L-3 PT Def at 46 (emphasis in original); *see also* Gov't PT Def at 44 ("[T]he references Mr. Tannas cited do not stand for the proposition that all red light must be *eliminated* from the cockpit.") (emphasis in original). In addition, some of the prior art references cited by Mr. Tannas teach that red is "acceptable in a cockpit utilizing NVGs." L-3 PT Def at 46. Dr. Task commented further on this point at trial:

DR. TASK:	No, I don't believe it teaches away []. This is another one of those places where Mr. Tannas perhaps is confused with the desire to get rid of all of the nonessential red and infrared light in the cockpit. Remember, we understood that the cockpit itself is -- for general lighting was illuminated with red and there was no reason to have that general lighting red in the cockpit. So some of these references are referring to the red for general lighting, and quite often, in fact most of the time, the red was generated with incandescent bulbs that had considerable infrared light and that is what needed to be gotten rid of, the red in the infrared, reduced, of the general cockpit lighting, but there were a number of places in the prior art that indicated that a small amount of red was acceptable.
GOVERNMENT COUNSEL:	Do you -- is it your understanding that these references, the prior art references taught one

	of skill in the art, taught one to remove red entirely?
DR. TASK:	No, they do not state or suggest that you need to remove red entirely. In fact, in TASK AND GRIFFIN [I], which I think he does refer to here[.] . . .
GOVERNMENT COUNSEL:	Are you referring to page 137, second bullet point?
DR. TASK:	Yes, page 137 of his testimony and he references one statement that was made in TASK AND GRIFFIN [I] but there is another statement in TASK AND GRIFFIN [I] that came up earlier this week where the article specifically says what needs to be done to improve the filter over the display is to increase the amount of red light at 630 nanometers, which is well within the wavelength range of the red color band, and then to block more of the light from 650 nanometers, out to 900 nanometers, is what the article said. So this is teaching basically what you want to do in the '914 patent. You want to have more light at the lower wavelength region of the color band and remove the upper part. So you want to reduce the red by reducing the longer wavelengths of red because they don't do you much good.

TR 1658-60.

In addition, prior art taught that NVGs can tolerate narrowband emissions from all colors of light. *See* L-3 PT Def at 46 (citing DE 511 at GVT009-0782 ("NVGs can tolerate narrow band emissions for all colors of light[.]")); *see also* Gov't PT Def at 45 (citing DE 511 at GVT009-0782); *see also id.* (citing DMX 4 at D000597 ("[A] small proportion . . . of yellow and red light is not that disturbing to the NVG.")). For this reason, Mr. Tannas also acknowledged that several prior art references that he cited suggested reducing red light. *See* TR 1268-99 (Tannas); *see also* TR 1169-70, 1294-1300.

The Government and Defendant-Intervenors explain that reducing red in the cockpit was an engineering "trade off" between night vision capability and cockpit lighting and that the issuance of

the '914 patent did not change the necessity for this "trade off." *See* L-3 PT Def at 47 ("The '914 patent does not teach any method for increasing red in the cockpit while keeping NVG capability the same. The more a filter cuts off from the shorter wavelengths, the less the NVGs will have to amplify.") (citing TR 362-63 (Reetz); TR 147, 178-79 (Bradford); TR 1548-49, 1554 (Task)); *see also* Gov't PT Def at 44 ("These references would not 'discourage' one of skill in the art from seeking other engineering tradeoffs, such as allowing more red light in the cockpit while sacrificing some goggle performance - this was a principle that was well-understood in 1985."). This "trade off" is the reason the military issued MIL-L-85762. *See* L-3 Def Reply at 7 ("The military decided that the best approach was to give helicopter pilots as much NVG sensitivity as possible, which meant they must eliminate longer, red wavelengths in the cockpit so that the NVG filter would allow more wavelengths from outside the cockpit without interference.") (citing TR 361 (Reetz) ("85762 was written primarily with helicopters in mind.")); *see also* Gov't PT Reply at 17 ("MIL-L-85762 set an initial tradeoff, based on a study of pilot preferences, that favored the performance of NVGs over more color in the cockpit."). Significantly, the principal invention of the '914 patent disclosed red cockpit lighting, but the record does not evidence "teaching away" by the '914 patent or that it excluded the use of red in a cockpit. *See* Gov't PT Reply at 17 (citing DE 57 at H03235).[33] Finally, the Government states that the Army spent $52 million removing red *floodlighting* and warning lights from cockpits, which would have been necessary, irrespective of the '914 patent. *See* Gov't PT Reply at 18 (citing DE 500 ¶¶ 222-24 ("One must not confuse the teachings of the prior art that rightly advocated getting rid of the massive amounts of unnecessary red and infrared light that was used for general cockpit lighting with the teachings that small amounts of (desirable) red light in indicators and displays could be tolerated by the properly filtered NVGs.")).

For these reasons, the court has determined that the prior art does not teach away from the '914 invention and the Government and Defendant-Intervenors have established by clear and

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[33] Honeywell asserts that DE 57 is not relevant to the obviousness inquiry, because:

> The memo is an internal company memo, and there is no way to separate Mr. Cohen's independent thinking from what he learned from others. Moreover, as a confidential, nonpublic document authored by the inventor, it cannot be relied upon to prove knowledge of one of ordinary skill in the art or anything else relevant to the obviousness issue.

Pl PT Op Def at 88 (citing *In re Omeprazole Patent Lit*., 490 F. Supp. 2d at 520 (concluding that certain documents were not prior art because "no party has presented any evidence that [the documents] were accessible to the public prior to the critical date").

The court agrees that the Cohen memo (DE 57) is not "prior art." Nevertheless, it is relevant in the obviousness analysis. *See United States* v. *Abel*, 469 U.S. 45, 56 (1984) ("[T]here is no rule of evidence which provides that testimony admissible for one purpose and inadmissible for another purpose is thereby rendered inadmissible[.]"). For these reasons, the court admitted DE 57 into evidence.

convincing evidence that allowing the red color band in an aircraft cockpit was an engineering "trade-off."

> In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress[.]

See KSR, 127 S. Ct. at 1741.

As Mr. Reetz testified:

MR. REETZ:	[MIL-L-]85762 was written primarily with helicopters in mind, and we did not have any full color displays in helicopters at that time, so that was not a concern.
GOVERNMENT COUNSEL:	At a later point, did the issue of red then present itself to the committee?
MR. REETZ:	Yes, right about when 85762 was published. As I mentioned, we did the TA-7 test.
THE COURT:	Tell me when that was published.
MR. REETZ:	The 85762?
THE COURT:	[Yes].
MR. REETZ:	January of '86. As I mentioned before, we did the TA-7 tests in 1984, and they were successful, and that led to the conclusion that we could use night vision goggles in jet airplanes. Well, the jet air crews had a different opinion than the helicopter air crews about the elimination of red, and their conclusion was we needed to keep red. The primary concern was, again, in the jet, you had less time to react, and they relied on color differentiation more than the helicopter crews did. That's what they told us. So their opinion, and primarily, this was some of the F-18s now, their opinion is we need to keep

> red warning lights, and so the F-18 program office came back to the tri-service community and said, can you rewrite the specification to allow the use of red warning lights? And that's what we worked on, and we came to the conclusion, yeah, we could do that, but in order to do that, you're going to have to give up goggle performance. The reason you have to give up goggle performance is you have to move the minus blue filter to a higher wavelength. When you move the minus blue filter to a higher wavelength, you lose goggle performance because you're eliminating, you're taking the goggle sensitivity curve and making it smaller, so you don't have as much sensitivity. The jet community said, I can live with that, I would rather have red and lose goggle performance. The helicopter people still were of the opinion, no, I don't want to lose goggle performance, and I don't need red. So version A of the spec, which eventually came out in 1988, I believe, gives air crew, airplane designers an option. They could either use it with what's called the class A night vision goggles, which had 625 minus blue filter, or we ended up coming up with a class B goggle, which had the 665 nanometer minus blue filter. So you had a choice, you could use the class A with no red, or you could use class B and have some red.

TR 361-63.

In addition, the Government and Defendant-Intervenors have established by clear and convincing evidence that the '914 patent did not eliminate the need to have a "trade-off" between allowing the red color band and NVG performance, nor does Honeywell claim otherwise.

Finally, the court has reviewed each of the six prior art references cited by Mr. Tannas,[34] and has determined that they do not demonstrate that the prior art "teaches away." TASK & GRIFFIN I does not teach away from claim 2. *See* TR 1658-60 (Task) ("[T]here is another statement in TASK AND

[34] *See* DMX 4, DE 146, DE 301, DE 324, DE 506, and DE 524. The court has determined that the REETZ THESIS (DE 301), is not prior art.

GRIFFIN [I] that came up earlier this week where the article specifically says what needs to be done to improve the filter over the display is to increase the amount of red light at 630 nanometers[.]"). Moreover, Mr. Tannas relies on references that refer to floodlighting and other warning lights in cockpits that are different from the "small amounts of (desirable) red light in indicators and displays [that] could be tolerated by the properly filtered NVGs." DE 500 ¶¶ 222-24; *see also* DE 324 at GVT012-2378 ("[C]onventional cockpit lighting, which is rich in red and near IR radiation, tends to overload the NVG[.]"); DE 146 at GVT019-1643 ("[W]henever the ANVIS is exposed to cockpit lighting that is *too* intense between 600 and 900 [nm] . . . the ANVIS becomes *less* sensitive to the radiance of the outside scene[.]") (emphasis added); DE 524 at GVT008-0847 ("The F/A-18 production *warning, caution, and advisory lights* are not compatible with the NVG systems[.]") (emphasis added); DMX 4 at D000597 ("American experiments [] have shown that blue/green illuminated cockpit is not as easy to detect as an incandescently or red illuminated cockpit."). Collectively, these prior art references establish that engineering and design "trade-offs" were necessary and that a full color display, under certain circumstances, could be used in a NVG compatible cockpit. Accordingly, the court has determined that these "known disadvantages . . . would [not] naturally discourage the search for new inventions" like the '914 patent. *See Adams*, 383 U.S. at 52.

e. Secondary Considerations.

The final step in the *Graham* analysis requires the court to take into account "secondary considerations." *See Graham*, 383 U.S. at 17-18.

i. Governing Precedent.

The United States Supreme Court has determined that:

> secondary considerations [such] as commercial success, long felt but unsolved needs, failure of others, etc., *might be* utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries *may have* relevancy.

Graham, 383 U.S. at 17-18 (emphasis added).

Some courts have determined that secondary considerations "only need be considered in close cases." *Med. Lab. Automation, Inc.* v. *Labcon, Inc*., 670 F.2d 671, 675 (7th Cir. 1981); *see also Kaiser Indus. Corp*. v. *McLouth Steel Corp*., 400 F.2d 36, 41 (6th Cir. 1968), *cert. denied*, 393 U.S. 1119 (1969). The United States Court of Appeals for the Federal Circuit, however, has stated that:

> It is jurisprudentially inappropriate to disregard any relevant evidence on any issue in any case, patent cases included. Thus evidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a

> determination of obviousness. Indeed, evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art was not. It is to be considered as part of all the evidence, not just when the decisionmaker remains in doubt after reviewing the art.

Stratoflex, Inc. v. *Aeroquip Corp.*, 713 F.2d 1530, 1538-39 (Fed. Cir. 1983) (citations omitted); *but see Pfizer, Inc.* v. *Apotex, Inc*., 480 F.3d 1348, 1372 (Fed. Cir. 2007) ("Although secondary considerations must be taken into account, they do not necessarily control the obviousness conclusion."). Although our appellate court has considered secondary considerations as a separate substantive inquiry, as a matter of trial practice, this analysis typically arises as rebuttal to a *prima facie* finding of obviousness. *See KSR*, 127 S. Ct. at 1745 ("Teleflex has shown no secondary factors to *dislodge* the determination that claim 4 is obvious.") (emphasis added); *see also Alza Corp*. v. *Mylan Labs. Inc*., 464 F.3d 1286, 1293 (Fed. Cir. 2006) (concluding that the appellee "had established a strong *prima facie* case of obviousness, which [appellant] had failed to rebut through secondary considerations.").

As Professor Kitch has observed:

> [Secondary considerations] involve four inferences. First, that the commercial success is due to the innovation. Second, that if an improvement has in fact become commercially successful, it is likely that this potential commercial success was perceived before its development. Third, the potential commercial success having been perceived, it is likely that efforts were made to develop the improvement. Fourth, the efforts having been made by men of skill in the art, they failed because the patentee was the first to reduce his development to practice. Since men of skill in the art tried but failed, the improvement is clearly non-obvious.

E. Kitch, *Graham* v. *John Deere Co.: New Standards for Patents*, 1966 SUP. CT. REV. 293, 330-35 (1966).

The Government, however, argues that "if a court determines from the three step *Graham* framework that a claimed invention would have been obvious, 'secondary considerations cannot fill the gap.'" Gov't PT Def at 46 (quoting *Fromson* v. *Advance Offset Plate, Inc*., 755 F.2d 1549 (Fed. Cir. 1985)). This argument, however, misstates the law. In *Fromson*, our appellate court stated that:

> Objective evidence ("secondary considerations"), such as commercial success due to the merits of the invention, must when present be considered as part of the obviousness equation. The district court erred here in reaching a conclusion on obviousness before considering the evidence of secondary considerations, and in then evaluating the latter solely on its "gap filling" capacity.

Id. at 1557.

ii. "Long Felt Need."

Honeywell argues that red light had been used in military cockpits for 40 years prior to 1985. *See* Pl PT Op Def at 73 (citing TR 85 (Reetz)) ("[F]or the last 40 years, we had red in the cockpit in terms of warning lights[.]"); PTX 833 ¶ 56 ("Red has been in the cockpit for many decades."); PTX 833 ¶ 56 ("[R]ed has always been perceived as the color that denotes danger[.]")). Therefore, red is used in cockpit warning lights, is also used for full color maps, and is not diminished when NVGs are used in the cockpit. *See* Pl PT Op Def at 74 (citing DE 61 at 62 (SCOUGHTON); PTX 833 ¶ 55). For these reasons, "the prior art . . . demonstrates a desire for full color NVG compatible displays in military aircraft cockpits."[35] Pl PT Op Def at 75. Honeywell concedes, however, that BOEHM, VERNEY, BREITMAIER, and the REETZ THESIS[36] discuss "full color displays in the context of NVG compatibility, but [fail] to propose any definitive solution for enabling that goal to be achieved." Pl PT Op Def at 75. The Government and Defendant-Intervenors counter that there was no "long felt need" for full color displays, because of the issue of daylight readability. *See* L-3 PT Def at 49-50 ("[T]here was no long standing problem of making NVGs compatible with full color displays in existing cockpits."); *see also* Gov't PT Def at 47 ("The record is clear that as of 1985, full color displays had yet to be widely implemented in aircraft cockpits." (citing TR 361 (Reetz); TR 978 (Lawrence))).

The record evidences that, as of 1985, full color displays had not been implemented in military cockpits. *See, e.g.*, TR 361 (Reetz) ("[W]e did not have any full color displays in helicopters at that time, so that was not a concern."). A significant reason was that there were engineering and design "trade-offs" that limited the teaching of the prior art. *See* DMX 4 at D000597 ("American experiments [] have shown that blue/green illuminated cockpit is not as easy to detect as an incandescently or red illuminated cockpit."); *see also* TR 1549 (Task) (testifying that there were "other forces at play" that caused engineers to choose the sensitivity of NVGs over color in the cockpit). Floodlighting and other warning lights in cockpits, however, were distinct from the "small amounts of (desirable) red light in indicators and displays [that] could be tolerated by properly filtered NVGs." DE 500 ¶¶ 222-24. For these reasons, the court has determined that Plaintiffs' failed to establish that, in 1985, there was a "long felt need" for a NVG compatible full color display.

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[35] Honeywell makes this argument under the heading: "The Prior Art Evidences A Desire For NVG Compatible Full Color Displays, But Proposes No Solution For Achieving Both Simultaneously." Pl PT Op Def at 74. This is not a factor discussed in *Graham* and Honeywell cite no authority for the use of this factor. *See Graham*, 383 U.S. at 17-18. Therefore, the court has considered this argument more properly viewed as a "long felt need."

[36] The court has determined that the REETZ THESIS is not prior art.

iii. "Failure Of Others."

Honeywell also argues that the MIL-L-85762 specification establishes that the "failure of others" gave rise to the solution of the '914 patent. *See* Pl Pt Op Def at 75-82. The court has determined, however, that the MIL-L-85767 specification represented an engineering "trade-off" and did not "teach away" from the '914 patent, nor was it the result of the "failure of others." *See* Section II.C.3.d.iii, *supra*; *see also* TR 361 (Reetz) ("[MIL-L-]85762 was written primarily with helicopters in mind, and we did not have any full color displays in helicopters at that time, so that was not a concern.").

iv. "Commercial Success."

In addition, Honeywell asserts that the court's *prima facie* determination that claim 2 was infringed, together with the testimony of Mr. Tannas and Ms. Davis, establish the '914 invention's "commercial success." *See* Pl PT Op Def at 82-83 (citing *Demaco Corp.* v. *F. Von Langsdorff Licensing, Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 956 (1988) (a "*prima facie* case of nexus is generally made out when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent")); *see also J.T. Eaton & Co.* v. *Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997) ("When a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention."). Here, Honeywell relies on Mr. Tannas' testimony that "[t]here is a high demand for aircraft cockpit displays for military use that are both full color [including red] and NVG compatible." PTX 834 ¶ 266. In addition, Ms. Davis testified that there was a "demand for the benefits of the patented technology and [a] lack of alternative technologies for providing the same benefits." PTX 1351 ¶¶ 101-19. Accordingly, Honeywell concludes that the "prominence of the patented technology in marketing materials alone demonstrates a sufficient link between the patented invention and the commercial success." Pl PT Op Def at 85 (citing *Gambro Lundia AB* v. *Baxter Healthcare Corp.,* 110 F.3d 1573, 1579 (Fed. Cir. 1997) ("The prominence of the patented technology in Baxter's advertising creates an inference that links the Gambro invention to this success.").

The Defendant-Intervenors and Government reject any relationship between the claimed invention and commercial success. *See* L-3 PT Def at 51 (citing *Ormco Corp.* v. *Align Tech., Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006) ("[I]f the commercial success is due to an unclaimed feature of the device, the commercial success is irrelevant."); *see also* Gov't PT Def at 48 (same). Instead, any "commercial success" achieved was due to the advance of daylight readable full color displays, not the '914 patent. *See* L-3 Def Reply at 46-47 (citing DE-500 ¶ 215 (Task); TR 238, 243-44 (Dunn); TR 368-72 (Reetz); TR 1005 (Lawrence)).

The record evidences that the invention in the '914 patent achieved commercial success. *See* DE 602 (demonstrating that Honeywell sold 1,269 CMFDs for approximately $58,090,403 and L-3 sold a combined total of more than 1000 CMDUs and RDUs that were "critical to the business of L-3"); *see also* ADELMAN, at 370 ("Courts have sometimes counted the sales of infringers, as well as those of the patentee, in order to determine whether an invention enjoyed commercial success."); CHISUM ON PATENTS § 5.05(2)(g), at 5-698 (2007) ("[S]ome court decisions give weight to the infringer's success and even to that of other members of the industry."). Therefore, the court has determined that Honeywell made a *prima facie* showing that the patented invention achieved commercial success. *See Demaco Corp.*, 851 F.2d at 1392 (requiring the patentee to show "both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent[.]").

The Government and Defendant-Intervenors, however, have presented rebuttal evidence that this commercial success was attributed to the development of daylight readable full color displays, not the '914 patent. *See* L-3 Def Reply at 46; *see also* DE-500 ¶¶ 205-206; TR 262-63 (Dunn). Moreover, Honeywell failed to reconcile allegations of a "long felt" need for the '914 invention with the fact that the invention had no commercial success until 1993. *See* CHISUM ON PATENTS § 5.05(2)(a), at 5-662 (2007) ("Judge Hand thought evidence of commercial success important primarily as an adjunct to the test of long felt need.") (citing *Textile Mach. Works* v. *Louis Hirsch Textile Machines, Inc.*, 87 F.2d 702, 704 (2d Cir. 1937)).[37]

Moreover, the record does not support an inference that efforts were made to develop the invention described in claim 2 since full color displays were not widely used in aircraft cockpits in 1985. *See, e.g.*, DE-500 ¶ 215 (Task); TR 368-72 (Reetz); TR 238, 243-44 (Dunn); TR 1005 (Lawrence).

Assuming, *arguendo*, that Honeywell met the burden to establish "commercial success," that factor alone is not sufficient to render claim 2 of the '914 patent nonobvious. *See Merk & Co.* v. *Biocraft Lab., Inc.*, 874 F.2d 804, 809 n.* (Fed. Cir. 1989) (determining that commercial success was not enough to demonstrate nonobviousness); *see also Textile Mach. Works*, 87 F.2d at 704 ("But [commercial success] is a dangerous test to apply, and will lead one astray unless jealously watched."). Therefore, Honeywell has failed to establish that the "commercial success" of claim 2 of the '914 patent makes it nonobvious.

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[37] In fact, Honeywell's witness, Mr. John Donofrio, the former Vice President of Intellectual Property for Allied-Signal Technologies, Inc., the licensing entity for Allied-Signal Corp. (1996-2000) and General Counsel for Honeywell Aerospace (2000-2005), testified that after the issuance of the patent, no licences were purchased. *See* SA TR 217 ("L-3 COUNSEL: And the '914 patent was issued four years ago, no one has signed up in the intervening four years for a license for that patent, correct? MR. DONOFRIO: No, but no one will sign up while there is litigation pending. Everybody is going to sit on the sidelines and wait for the litigation. I mean, that's the logical thing to do.").

* * *

After a review of all of the *Graham* factors, the court has determined that the Government and Defendant-Intervenors have established by clear and convincing evidence that claim 2 is obvious. Obviousness is also supported by the prosecution history of the '914 patent. In this case, the Patent Examiner did not have a translated version of the GERMAN PATENT during prosecution, although the GERMAN PATENT disclosed all but two elements of claim 2 and therefore was more relevant than much of the cited prior art. *See Lindemann*, 730 F.2d at 1459 ("[T]he clear and convincing standard may more easily be met when such non-considered art is more pertinent than the cited art[.]") (citations omitted). Accordingly, for all these reasons, the court has determined that claim 2 of the '914 patent is obvious.

4. Defenses Set Forth In The First Paragraph Section 112 Of The Patent Act.

In this case, the Government and Defendant-Intervenors assert that Honeywell failed to meet the written description, enablement, or best mode requirements of Section 112 at the Patent Act. *See* Gov't PT Def at 54; *see also* L-3 PT Def at 56.

a. The Written Description Requirement.

The first paragraph of Section 112 of the Patent Act provides:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

35 U.S.C. § 112 ¶ 1.

The purpose of Section 112 is to increase the amount of public knowledge and information about the invention, so that it may be used to further research and innovation, even after the patent expires. As the United States Supreme Court observed in *Bonito Boats* v. *Thunder Craft Boats*, 489 U.S. 141 (1989):

> The federal patent system . . . embodies a carefully crafted bargain for encouraging the creation and disclosure of new, useful, and nonobvious advances in technology and design in return for the exclusive right to practice the invention for a period of years. [The inventor] may keep his invention secret and reap its fruits indefinitely. In consideration of its disclosure and the consequent benefit to the community, [a] patent is granted. An exclusive enjoyment is guaranteed [the inventor] for seventeen

> years, but upon expiration of that period, the knowledge of the invention inures to the people, who are thus enabled without restriction to practice it and profit by its use.

Id. at 150-51 (quotations and citation omitted).

The written description requirement of Section 112 requires that the specification fully disclose the invention. *See* 35 U.S.C. § 112 ¶ 1; *see also* Mark D. Janis, *On Courts Herding Cats: Contending with the "Written Description" Requirement (and Other Unruly Patent Disclosure Doctrines)*, 2 WASH. U. J.L. & POL'Y 55, 59 (2000) ("The written description requirement purports to measure whether the written description in a patent disclosure 'reasonably convey[s] to one of skill in the art that the inventor possessed' the claimed subject matter.") (citation omitted).

Section 132 of the Patent Act also prohibits a new claim, amendment, or addition to the patent specification that introduces new matter after the filing date. *See* 35 U.S.C. ¶ 132 ("No amendment shall introduce new matter into the disclosure of the invention."). Therefore, to amend a patent claim, an inventor must demonstrate that the original patent application contained the subject matter of the amendment. *See* 35 U.S.C. § 112 ¶ 1; *see also* ALDEMAN, *supra*, at 470 ("In other words, any claims amended after the filing date or new claims filed after the filing date must contain the same invention as the original disclosure."). As the predecessor to the United States Court of Appeals for the Federal Circuit explained in *In re Smith*, 481 F.2d 910 (C.C.P.A. 1973):

> Acknowledgment of [the written description] requirement evidences appreciation of an important purpose of § 112, first paragraph, which is the definition of the attributes which a patent specification must possess as of the filing date to be entitled to that filing date as a prima facie date of invention. Satisfaction of the description requirement insures that subject matter presented in the form of a claim subsequent to the filing date of the application was sufficiently disclosed at the time of filing so that the prima facie date of invention can fairly be held to be the filing date of the application.

Id. at 914; *see also Vas-Cath, Inc.* v. *Mahurkar*, 935 F.2d 1555, 1561 (Fed. Cir. 1991) ("Adequate description of the invention guards against the inventor's overreaching by insisting that he recount his invention in such detail that his future claims can be determined to be encompassed within his original creation.") (quotation omitted).

Therefore, in determining, whether the '269 Application contains the same subject matter as subsequent amendments, the court must determine whether "the inventor conveyed with reasonable clarity to those of skill in the art that he was in possession of the subject matter of the claims." *Union Oil Co.* v. *Atl. Richfield Co.,* 208 F.3d 989, 997 (Fed. Cir. 2000); *see also Koito Mfg. Co., Ltd.* v. *Turn-Key-Tech, LLC*, 381 F.3d 1142, 1154 (Fed. Cir. 2004) ("This Court . . . require[s] the patent specification to describe the claimed invention so that one skilled in the art can recognize what is claimed." (quotation and citation omitted)). "Reasonable clarity" requires "one skilled in the art, reading the original disclosure, *immediately* [to] *discern* the limitation at issue in the claims."

Purdue Pharma L.P. v. *Faulding Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000) (citations and quotations omitted) (emphasis added). In conducting this inquiry, the trial court must only consider what one skilled in the art would understand from the disclosure, not what would have been obvious.

As our appellate court observed in *Lockwood* v. *Am. Airlines*, 107 F.3d 1565, (Fed. Cir. 1997):

> It is the disclosures of the applications that count. Entitlement to a filing date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed. It extends only to that which is disclosed. While the meaning of terms, phrases, or diagrams in a disclosure is to be explained or interpreted from the vantage point of one skilled in the art, all the limitations must appear in the specification. The question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification. Rather, a prior application itself must describe an invention, and do so in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought. . . . One shows that one is 'in possession' of the *invention* by describing the *invention*, with all its claimed limitations, not that which makes it obvious. One does that by such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention. Although the exact terms need not be used *in haec verba*, the specification must contain an equivalent description of the claimed subject matter. A description which renders obvious the invention for which an earlier filing date is sought is not sufficient.

Id. at 1571-72 (emphasis in original) (quotations and citations omitted); *see also LizardTech, Inc.* v. *Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005) ("[The specification] must describe the invention sufficiently to convey to a person of skill in the art that the patentee had possession of the claimed invention at the time of the application, *i.e.*, that the patentee invented what is claimed.").

L-3 contends that claim 2 of the '914 patent requires a "system that filters a narrowband of the red color band from a single *multiband* source of light," and that the '269 Application prior to April 22, 1986, the date a Secrecy Order was imposed, ("original '269 Application") of the '914 patent did not describe filtering a narrowband of the red color band from this source of light. *See* L-3 PT Def at 58-59 (emphasis added). In addition, claim 2 of the '914 patent also requires a "local source of light having blue, red, and green color bands," that the court construed as "[a]n essential element of the local color display that must be perceptible to an observer . . . with a night vision aid." *Id*. at 58 (quoting *Honeywell II*, 66 Fed. Cl. at 447). Accordingly, claim 2 "encompasses . . . a single multiband source of light that provides all three color bands." *See* L-3 PT Def at 58 (citing DE 500 ¶ 68). Because claim 2 also requires "a third filter," passing "a narrow range of wavelengths within the red color band," the original '269 Application should have described a system that applies a filter to a multiband source of light. L-3 PT Def at 59 (quoting *Honeywell II*, 66 Fed. Cl. at 487). The

specification, however, discloses three distinct monochromatic CRTs, not a single multiband source of light. *See* L-3 PT Def at 59-60 (citing DE 500 ¶ 65). In fact, if the bandpass filter disclosed therein were placed over a multiband source of light, the color display would be inoperative. *See* L-3 PT Def at 61 (citing TR 1605 (Task)). The original '269 Application also did not disclose a "plurality of filters at the local color display," because the "inventors were not in possession of a system that places the filters outside the display . . . and filters all three colors at the same time while maintaining a full color display[.]" L-3 PT Def at 62, 66.

The Government further argues that the disclosed display in the original '269 Application subsequently was broadened to include a "local color display." *See* Gov't PT Def at 55 ("Though the scope of the '914 patent was expanded in several ways, one easily identifiable alteration is Honeywell's complete abandonment of the display envisioned by Mr. Cohen in 1985."). The original '269 Application disclosed a specific display and a defined structure; however, claim 2 of the '914 patent is defined by color output. *Id*. ("This is radically different than [the] original application, which was a display defined by its *structure*[.]") (emphasis in original). Moreover, the original '269 Application disclosed "an arrangement with three monochromatic [CRTs]," that were critical to the invention, because by "using separate cathode ray tubes . . . it is possible to more easily filter offending colors from reaching the ANVIS[.]" DMX 36 at DE-1046. The original '269 Application also disclosed that: "In accordance with the present invention, a full color local display which uses separate primary color light sources is made compatible with an ambient night vision (ANVIS) aid." DMX-36 at DE-1041. Therefore, one skilled in the art, in 1985, would conclude that the structure of the display of the '269 Application, including three separate CRTs and filters, was an essential element. *See* Gov't PT Def at 57 ("[T]he person of ordinary skill would have seen the numerous references by Mr. Cohen to the required structure of the display, and been led to believe that the structure was essential to the invention.").

Honeywell responds that the court should afford deference to the Patent Examiner's approval of the 2002 amendments. *See* Pl PT Op Def at 124 ("Indeed, as reflected in the '760 file history, the Examiner considered the amendments to the specification and substitute drawings and expressly approved them.") (citing DMX 38 at D001702, 1706 (Notice of Allowability approving amendments to specification and drawings filed on January 23, 2002)). In this regard, Honeywell emphasizes that the original '269 Application "expressly states that other display configurations may be used." Pl PT Op Def at 126 (citing DMX 36 at D000011 ("While specific configurations of the local display 13 or 37 have been described, it is understood that the present invention can be applied to a wide variety of display and vision aid devices.")). Moreover, Honeywell argues that the display configuration is not essential to the invention. *See* Pl PT Op Def at 126. Therefore, one skilled in the art, in 1985, would determine that "'distinct monochromatic color generators' could include the distinct types of phosphors used in LCD backlighting." Pl PT Op Def at 127 (citing SA TR 1032-33 (Byrd)). Honeywell also contends that the Government's "color bands" argument regarding the arrangement of three monochromatic cathode ray tubes is in error, because that was a standard method of achieving a full color display, in 1985. *See* Pl PT Op Def at 128 (citing DE 500 at 3, 5, 33, DE-526-3; PTX 834 ¶ 512). Therefore, Honeywell concludes that "the three designated display systems could be found to infringe the '269 Application as originally filed." Pl PT Op Def at 129-

30. Moreover, since claim 2 of the '914 patent does not specify a location for the plurality of filters, L-3's argument that they must be "outside the display" makes "no sense." *Id*.

The court declines to afford the Patent Examiner deference in determining whether the original '269 Application was amended to introduce new material, since the issue of whether the '914 patent satisfied the written description requirement of Section 112 is an issue of fact and law, requiring the court to examine the entire record. *See* 35 U.S.C. § 282. Moreover, Honeywell's contention that the CRT display configuration is not essential to the original application is not credible. The original '269 Application clearly requires "a full color local display which uses *separate primary color light sources* [that] is made compatible with an ambient night vision (ANVIS) aid." DMX 36 at D000005 (emphasis added). For this reason, Dr. Task testified that the original '269 Application specifically relied on the "separate and distinct nature of the local source of light as it is composed of a plurality of monochromatic display transducers," and if the filters disclosed in the original '269 Application were placed over a multiband light source, the full color display would be inoperative. *See* DE 500 ¶ 68; TR 1605 (Task). Although Mr. Tannas testified that the three distinct monochromatic color generators are a local source of light, having blue, red, and green color bands (PTX 834 ¶ 501), the original '269 Application disclosed that:

> The technique of using three primary display colors to generate a full color image on a cathode ray tube allows a much greater time period for admitting light to the ANVIS 13 while still providing a high quality image to a local display 37 which uses a cathode ray tube.

DMX 36 at D000009.

The original '269 Application also stated that the "present invention can be applied to a wide variety of display and vision aid devices." The text, however, continued: "For example, the offending light which is blocked from admission to the ANVIS 13 may be interior ambient cockpit lighting, rather than the illumination of the display." DMX 36 at D000011. These words state that the inventor was contemplating other types of lighting, not other types of full color displays.[38] The court recognizes that "a claim need not be limited to a preferred embodiment." *Lampi Corp*. v. *Am. Prods., Inc*., 228 F.3d 1365, 1378 (Fed. Cir. 2000). On the other hand, a written description requires more than "a mere statement that it is part of the invention[.]" *See Fiers* v. *Revel*, 984 F.2d 1164, 1170-71 (Fed. Cir. 1993) ("[O]ne cannot describe what one has not conceived."). The court considers Honeywell's argument that the original '269 Application was meant to be used with

[38] The court also has considered whether ambient cockpit lighting could be a local source of light meeting the claim construction and determined that it is not, since Dr. Task testified that if the filters disclosed in the original '269 Application were used on a single source of light, the display would be inoperative. *See* TR 1605 (Task). In addition, neither the original '269 Application nor other evidence describes how the invention would filter ambient lighting in a way that it would meet the claim construction. *See Fiers*, 984 F.2d at 1170-71 (determining that a written description requires more than "a mere statement that it is part of the invention[.]").

displays, other than CRTs, such a "mere statement." *See* Pl PT Op Def at 127 ("On the contrary, 'other display transducers' were expressly *contemplated*." (emphasis added)); *see also id.* ("In light of the express *reference* to CRTs and 'other display transducers,' particularly when coupled with the express *statement* that the invention is applicable to a 'wide variety of display devices,' Defendants' assertions that the claims are limited to the particular CRT embodiment of original Figure 3 lack any support in the record.") (emphasis added). The original '269 Application, however, contains no indication that the inventor conceived of the invention being used with any displays other than CRTs. *See* DMX 36 at D000005 ("a full color display which uses separate primary color light sources"); *see also id.* at D000019 (diagram).

Nevertheless, Honeywell argued that Mr. Byrd's testimony demonstrates that "'distinct monochromatic color generators' *could include* the distinct types of phosphors used in LCD backlights." *See* Pl PT Op Def at 127 (citing SA TR 1032-33 (Byrd)) (emphasis added). Mr. Byrd's testimony concerning the phosphors used in LCD backlights, however, indicated otherwise:

HONEYWELL COUNSEL:	Mr. Byrd, are you familiar with fluorescent lamps that are used as back lights for liquid crystal displays in aircraft cockpits?
MR. BYRD:	Yes.
HONEYWELL COUNSEL:	And the lamps that are used as back lights contain distinct types of phosphors; is that correct?
MR. BYRD:	Yes.
HONEYWELL COUNSEL:	And each type of phosphor has a different chemical composition; is that right?
MR. BYRD:	Generally, yes.
HONEYWELL COUNSEL:	And the phosphors that are used in the fluorescent lamps that are used as back lights are coated as a solid powder on the inside of the fluorescent tube; is that right?
MR. BYRD:	Generally, yes.
HONEYWELL COUNSEL:	And each type of phosphor generates light when it is struck by a UV photon, that is emitted by the gas on the inside of the tube; is that right?
MR. BYRD:	That's a reasonable description, yes.

HONEYWELL COUNSEL: And the phosphors generate the colors of the display; is that correct?

MR. BYRD: They generate the light of multiple colors, which then is emitted by the display. It is a reasonable summary.

HONEYWELL COUNSEL: And the light emitted by a single type of phosphor, such as the green phosphor, could be called monochromatic; is that right? [objection and ruling omitted]

MR. BYRD: Certainly it *could* be, yes, it *could* be. *Not that I would normally refer to it that way*, but it could be.

HONEYWELL COUNSEL: It would not be unreasonable, an unreasonable use of the term to call it monochromatic, would it?

MR. BYRD: Not unreasonable, *it might be unusual, it might be confusing to an engineer who has a different perception of what monochrome means.*

SA TR 1032-34 (emphasis added).

Therefore, the court has determined that Mr. Byrd's testimony does not demonstrate that "one skilled in the art, reading the original disclosure, [would] immediately discern the limitation at issue in the claims." *See Purdue Pharma*, 230 F.3d at 1323 (quotations and citations omitted). Moreover, although Honeywell does not cite any portion of Mr. Tannas's several hundred pages of trial testimony, the court finds the following relevant to this inquiry:

GOVERNMENT COUNSEL: Let me ask you this: Do you understand that the written description inquiry is whether the inventor possessed the invention as of the filing date of the application?

MR. TANNAS: Yes.

TR 1251.

* * *

L-3 COUNSEL: Well, the patent doesn't state anything about how steep or sharp the filter has to be, does it?

MR. TANNAS: No, it does not. It just says split the red color band and divide it up between the night vision goggle and the viewer. So the [genius] of it comes into that hint -- that little clue that says there's going to be success here if you do this little trick. And sometimes these things really do boil down to just a little minutia but it's minutia that pushed the industry over so that they could make them fully compatible with full color displays.

TR 1352.

* * *

L-3 COUNSEL: The claim -- the patent doesn't say how steep the filter has to be, it doesn't specify filter, correct?

MR. TANNAS: No. I think it's up to the person implementing the concept to make it as steep as he needs to.

L-3 COUNSEL: It doesn't say how much gap there should be between a red right pass or block, correct?

MR. TANNAS: No. That would depend heavily on the light source -- where the energy was in the light source.

L-3 COUNSEL: And it doesn't say anything about where to draw the cutoff point in the red spectrum, correct?

MR. TANNAS: No, it doesn't. So now you have to go on designing the thing. So it really doesn't tell you how to design it.

L-3 COUNSEL: It doesn't tell you how to make the device that is the subject of the claims, does it?

MR. TANNAS: It tells you how to make it. It says split the red color band. *Now, the detail of implementing that is another step. And then after you do*

	that, then you go to another step, divide the filters. And after you do that, you go into the laboratory and do some tests. There's quite a bit of work to do after this concept is put forward.
L-3 COUNSEL:	Well, it tells you what the goal is, which is splitting the red color band, as you said, but it doesn't tell you how to make a display system and filtering system to do that, does it?
MR. TANNAS:	No, it does not. And I don't think it has to. One skilled in the trade, as defined by the courts, could pick this up and do it, I believe firmly.

TR 1353-54 (emphasis added).

The United States Court of Appeals for the Federal Circuit has held that "[w]hile the meaning of terms, phrases, or diagrams in a disclosure is to be explained or interpreted from the vantage point of one skilled in the art, all the limitations must appear in the specification. The question is not whether a claimed invention is an obvious variant of that which is disclosed in the specification." *Lockwood*, 107 F.3d at 1571-72 (citations and quotations omitted). To his credit, Mr. Tannas conceded that one skilled in the art, in 1985, would "have to go into the laboratory and do some tests." TR 1354 (Tannas). One skilled in the art, in 1985, "reading the original disclosure, [would not] immediately discern the limitation at issue in the claims." *See Purdue Pharma*, 230 F.3d at 1323 (quotations and citations omitted).

The Government and Defendant-Intervenors have established by clear and convincing evidence that the written description requirement was not met. Therefore, the court has determined that the written disclosure in the original '269 Application would not necessarily lead one skilled in the art, in 1985, to conclude that the original '269 Application contained the same subject matter as the amendments.

b. Enablement.

Section 112 of the Patent Act requires that a patent specification describe or enable "those skilled in the art to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc*. v. *Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quoting *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993)). The purpose of this enablement requirement is to insure that the specification fully informs the public about the invention. *See Nat'l Recovery Techs. Inc*. v. *Magnetic Separation Sys. Inc*., 166 F.3d 1190, 1195-96 (Fed. Cir. 1999) ("The enablement requirement ensures that the public knowledge is enriched by the patent

specification to a degree at least commensurate with the scope of the claims."). To determine whether the invention is enabled, the court must consider what is disclosed in the specification, in addition to the scope of what would be known to one of ordinary skill in the art, in 1985, without "undue experimentation." *Genentech*, 108 F.3d at 1365; *see also In re Goodman*, 11 F.3d 1046, 1049-50 (Fed. Cir. 1993) ("[T]he specification must teach those of skill in the art how to make and how to use the invention as broadly as it is claimed.") (quotation omitted). Invalidity "for lack of enablement is a conclusion of law and must be supported by facts proved by clear and convincing evidence[.]" *Nat'l Recovery Techs.*, 166 F.3d at 1195 (quotation omitted).

L-3 argues that the '914 patent presents only a "mere germ" of an idea that one skilled in the art, in 1985, could not recreate without "undue experimentation." *See* L-3 PT Def at 68 ("When a patent's description does not disclose a starting point or the conditions under which an invention can be made, by definition, undue experimentation is required to practice the invention thus rendering it invalid due to lack of enablement.") (citing *Genentech*, 108 F.3d at 1366) ("Tossing out a mere germ of an idea does not constitute enabling disclosure.").

Honeywell responds that the evidence presented by L-3 does not meet the required clear and convincing standard. *See* Pl PT Op Def at 137 ("L-3 has no evidence, much less clear and convincing evidence, supporting its belatedly asserted enablement defense." (citing *Johns Hopkins University* v. *Cellpro, Inc*., 152 F.3d 1342, 1359 (Fed. Cir. 1998) ("burden rested upon [defendant], who had to prove by clear and convincing evidence facts establishing a lack of enablement"))). In fact, Mr. Tannas's testimony, when viewed as a whole, confirms that one skilled in the art, in 1985, could make and use the full scope of the claimed invention. *See* Pl PT Op Def at 137 ("As L-3 acknowledges, Mr. Tannas's testified that '[o]ne skilled in the trade . . . could pick this [patent] up and do it,' *i.e.*, make a display system and filtering system to split the red color band." (citing TR 1354 (Tannas))).

Mr. Tannas, however, testified that:

> [The '914 patent] tells you how to make it. It says split the red color band. Now, the detail of implementing that is another step. And then after you do that, then you go to another step, divide the filters. And after you do that, *you go into the laboratory and do some tests. There's quite a bit of work to do after this concept is put forward*.

TR 1354 (emphasis added).

Therefore, the issue is whether the "tests" and "work," described by Mr. Tannas, constitute "undue experimentation." In that regard, the United States Court of Appeals for the Federal Circuit has held that:

> The determination of what constitutes undue experimentation in a given case requires the application of a standard of reasonableness, having due regard for the nature of the invention and the state of the art. The test is not merely quantitative, since a

> considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed[.]

In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988) (citations and quotations omitted).

Based on the testimony of Mr. Tannas and L-3's concession that "engineers quickly integrated NVGs by simply measuring the required wavelength cutoff needed and ordering the filters off the shelf," the court has determined that the required experimentation was not "undue." *See* L-3 PT Def at 12 (citing DE 500 at 93-94; TR 262-63 (Dunn); DE 57 H03235 (Cohen Memo)). Accordingly, the Government and Defendant-Intervenors failed to establish clear and convincing evidence that the '914 patent was not enabled.

c. Best Mode.

Section 112 of the Patent Act requires that the specification of a patent also set forth the "best mode contemplated by the inventor of carrying out his invention." 35 U.S.C. § 112 ¶ 1. This requirement reflects the "statutory bargained-for-exchange by which a patentee obtains the right to exclude others from practicing the claimed invention for a certain time period, and the public receives knowledge of the preferred embodiments for practicing the claimed invention." *Eli Lilly & Co.* v. *Barr Labs*., 251 F.3d 955, 963 (Fed. Cir. 2001) (citation omitted). Therein, the United States Court of Appeals for the Federal Circuit has established a two-prong inquiry for determining whether a patent specification complies with the best mode requirement:

> Our case law explicating the best mode requirement focuses on a two-prong inquiry. First, the factfinder must determine whether, at the time of filing the application, the inventor possessed a best mode for practicing the invention. Second, if the inventor possessed a best mode, the factfinder must determine whether the written description disclosed the best mode such that one reasonably skilled in the art could practice it. The first prong involves a subjective inquiry, focusing on the inventor's state of mind at the time of filing. The second prong involves an objective inquiry, focusing on the scope of the claimed invention and the level of skill in the art.

Eli Lilly & Co., 251 F.3d at 963 (citations omitted).[39]

[39] Whether a plaintiff can satisfy the "best mode" inquiry is a question of fact, requiring the defendant to establish non-compliance by clear and convincing evidence. *See N. Telecom, Ltd.* v. *Samsung Elecs. Co.*, *Ltd.*, 215 F.3d 1281, 1286 (Fed. Cir. 2000) ("Compliance with the best mode requirement is a question of fact[.]); *see also Transco Prod. Inc*. v. *Performance Contracting Inc.*, 38 F.3d 551, 559-60 (Fed. Cir. 1994); *Chiron Corp*. v. *Genentech, Inc*., 268 F. Supp.2d 1148, 1170-71 ("Because [an accused infringer] has a clear and convincing burden of proof at trial, [the] evidence must do more than simply raise some doubt regarding the best mode requirement." (citation omitted)).

L-3 argues that the inventor's subjective "best mode" in this case, is established by Mr. Cohen's deposition testimony:

DEFENDANT COUNSEL: What is [the drawing in figure 3] showing?

MR. COHEN: This is showing some sort of image source. It shows a general source that may have three -- the three different colors which could be pixels or could be three separate CRTs. As I had mentioned before, the way. . . a shadow mask gets color through individual pixels. A liquid crystal -- color liquid crystal has individual pixels for the color with individual colors on the pixel. Or you could have individual CRTs.

DE 54 at 439.

* * *

The original drawing was more specific than the text because the original drawing just showed like three CRTs, but it didn't have to be.

DEFENDANT COUNSEL: Okay. And that was your understanding in 1985?

MR. COHEN: Well, in 1985 I was looking at the liquid crystal as a color display. So, yes. And as a color display, that would be the way we would do it. In 1985 the picture was drawn as CRTs because CRTs were the predominant technology that existed at the time. But as I had previously testified, I had looked at liquid crystal and I felt that would be the right way to go. Now, the fact that the original drawing didn't show that possibility which was -- that was a shame. It should have. . . .

DEFENDANT COUNSEL: Okay. And it was your expectation at that time that LCD would eventually be used in cockpit displays, correct?

MR. COHEN: Yes.

DE 54 at 440-43.

Honeywell counters that, "[r]ead in its entirety, Mr. Cohen's testimony fails to support the first prong of the best mode inquiry, which 'is highly subjective and focuses on the inventor's state of mind as of the date of filing the application.'" Pl PT Op Def at 141 (quoting *Bayer AG* v. *Schein Pharm., Inc*., 301 F.3d 1306, 1320 (Fed. Cir. 2002)). In addition, contemplating the use of LCDs does not necessarily render that use the best mode. *See* Pl PT Op Def at 142 ("On the contrary, Mr. Cohen testified that 'liquid crystal was in [his] mind, [b]ut it was not at the foremost of [his] mind because it . . . had not reached the preeminence it has now.'") (quoting DE 54 at 443 (Cohen Dep.)).

In this case, the inventor of the '914 patent, Mr. Cohen, testified that he considered "the CRT [] the preeminent technology at the time." DE 54 at 442-43 (Cohen Dep.). Therefore, Mr. Cohen disclosed what he considered to be the best mode for the invention. *See Eli Lilly*, 251 F.3d at 963 ("The first prong involves a subjective inquiry, focusing on the inventor's state of mind at the time of filing.").[40] Therefore, the court has determined that the Government and Defendant-Intervenors did not establish by clear and convincing evidence that the specification necessarily disclosed the best mode.

5. Definiteness Defense Set Forth In The Second Paragraph Of Section 112 Of The Patent Act.

Section 112 of the Patent Act requires that a patent specification include one or more claims, "particularly pointing out and distinctly claiming subject matter which the applicant regards as his invention." 35 U.S.C. § 112 ¶ 2. The United States Court of Appeals for the Federal Circuit has held that the standard for assessing whether a patent claim is sufficiently definite to satisfy Paragraph 2 of Section 112 is "whether one skilled in the art would understand the bounds of the claim when read in light of the specification." *Miles Labs., Inc*. v. *Shandon, Inc*., 997 F.2d 870, 875 (Fed. Cir. 1993). Therefore, trial courts have been instructed:

> In determining whether that standard is met, *i.e*., whether the claims at issue [are] sufficiently precise to permit a potential competitor to determine whether or not he is infringing, we have not held that a claim is indefinite merely because it poses a difficult issue of claim construction. We engage in claim construction every day, and cases frequently present close questions of claim construction on which expert witnesses, trial courts, and even the judges of this court may disagree. Under a broad concept of indefiniteness, all but the clearest claim construction issues could be regarded as giving rise to invalidating indefiniteness in the claims at issue. But we have not adopted that approach to the law of indefiniteness. We have not insisted that claims be plain on their face in order to avoid condemnation for indefiniteness; rather, what we have asked is that the claims be amenable to construction, however difficult that task may be. If a claim is insolubly ambiguous, and no narrowing construction can properly be adopted, we have held the claim indefinite. If the

[40] The court could not find any case law holding that the best mode must be the most technologically advanced mode.

> meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds. By finding claims indefinite only if reasonable efforts at claim construction prove futile, we accord respect to the statutory presumption of patent validity, and we protect the inventive contribution of patentees, even when the drafting of their patents has been less than ideal.

Exxon Research & Eng'g Co. v. *United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001) (citations and quotations omitted).[41]

The Government and Defendant-Intervenors argue that the court's interpretation of "narrowband of the red color band" as "measurable" or "perceptible" does not allow one skilled in the art to understand the scope of the claim, when read in light of the specification. *See* Gov't PT Def at 59 ("Specifically, the claim limitation 'narrowband of the red color band,' interpreted to require only that light within the range of 620 to 780 nm be 'measurable' or 'perceptible,' is indefinite."); *see also* L-3 PT Def at 75 ("[T]he '914 patent provides no guidance as to the level of light that is considered measurable, nor is that term understood by a person skilled in the art." (citing DE-500 ¶ 82)).

Honeywell responds that "[a] claim can be found indefinite only if it [is] so insolubly ambiguous that it cannot be construed." Pl PT Op Def at 131 (citing *Energizer Holdings* v. *ITC*, 435 F.3d 1366, 1371 (Fed. Cir. 2006) ("A claim that is amenable to construction is not invalid on the ground of indefiniteness.")). Moreover, Honeywell observes that the Government "advocated the very constructions that were adopted by the Court." *See* Pl PT Op Def at 134-35. Therefore, the Government and Defendant-Intervenors should be estopped from arguing indefiniteness at this stage of the proceedings. *See* Pl PT Op Def at 135.

The United States Court of Appeals for the Federal Circuit has held that: "A claim that is amenable to construction is not invalid on the ground of indefiniteness." *Energizer Holdings*, 435 F.3d at 1371. In this case, the court has construed all the claims of the '914 patent requested by the parties and determined that the '914 patent is not indefinite. *See Honeywell II*, 66 Fed. Cl. at 400; *see also Exxon Research*, 265 F.3d at 1375 ("If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.").

[41] The "determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." *Personalized Media Communications, L.L.C.* v. *Int'l Trade Comm'n*, 161 F.3d 696, 702 (Fed. Cir. 1998).

6. The "First Sale" Doctrine.

Section 271(a) of the Patent Act provides: "Except as otherwise provided in this title, . . . whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefore, infringes the patent." 35 U.S.C. § 271(a). Authorization may occur upon the sale of a patent, without condition. *See Intel Corp*. v. *ULSI Sys. Tech*, 995 F.2d 1566, 1568 (Fed. Cir. 1993) ("The law is well settled that an authorized sale of a patented product places that product beyond the reach of the patent.") (citing *Bloomer* v. *Millinger*, 68 U.S. 340, 350-51 (1864)); *see also Adams* v. *Burke*, 84 U.S. 453, 456 (1873) ("[I]n the essential nature of things, when the patentee, or the person having his rights, sells a machine or instrument whose sole value is in its use, he receives the consideration for its use and he parts with the right to restrict that use. The article . . . passes without the limit of the monopoly.").

The Government argues that, even if the '914 patent is valid, Honeywell should not be able to recover damages from the sale of CMFDs, because the infringing CMFDs were sold to the Government under an implied license. *See* Gov't PT Def at 61.[42] Honeywell counters that the "First Sale" Doctrine is inapplicable, because Honeywell had no rights under the '914 patent when the Government purchased the CMFDs. *See* Pl PT Op Def at 150. The sale of a patented invention "by someone other than the patentee or his licensee does not give rise to an implied license." Pl PT Op Def at 150-51 (citing *Boesch* v. *Graff*, 133 U.S. 697, 703 (1890) ("purchasers from [licensee in Germany were not] authorized to sell the articles in the United States in defiance of the rights of patentees under a United States patent")).[43]

The alleged infringing CMFDs were sold to the Government, prior to Honeywell Inc.'s merger with Allied Signal in 1999. *See* 8/1/05 TR 98-99 (Yeadon) (Allied Signal owned the '269 Application from 1995 until the December 1999 merger with Honeywell). The surviving entity of Honeywell's merger with Allied Signal is Honeywell International Inc., a Delaware Corporation:

> When any merger or consolidation shall have become effective . . . the constituent corporations shall become a new corporation, or be merged into 1 of such corporations . . . possessing all the rights, privileges, powers and franchises as well

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[42] The Government argues the "First Sale" Doctrine and legal estoppel defenses under the heading "Implied License." *See* Gov't PT Def at 61-63.

[43] *See Dekalb Genetics Corp*. v. *Pioneer Hi-Bred Inter'l, Inc*., 2001 WL 92118, *9 (N.D. Ill. Jan. 30, 2001) (unpublished) ("since Monsanto was not the owner of the '956 patent at the time the license was granted . . . [plaintiff's] patent rights cannot be exhausted through any license between Monsanto and [defendant]"); *Sanofi S.A.* v. *Med-Tec Veterinarian Products*, *Inc*., No. Civ. A. 83-2198, 1983 WL 417 at *6 (D. Kan. Sept. 16, 1983) (unpublished) (holding that acquiring the patented product from the subsidiary of the patent holder in the normal course of business is not sufficient to grant an implied license).

> of a public as of a private nature, and being subject to all the restrictions, disabilities and duties of each of such corporations so merged or consolidated[.]

Del. Code Ann. tit. 8, § 259. Accordingly, Honeywell International Inc. is subject to all of the "restrictions, disabilities and duties" of Honeywell Inc. *See* Del. Code Ann. tit. 8, § 259; *see also Fitzsimmons* v. *Western Airlines, Inc*., 290 A.2d 682, 685 (Del. Ch. 1972) ("It is thus a matter of statutory law that a Delaware corporation may not avoid its contractual obligations by merger; those duties 'attach' to the surviving corporation and may be 'enforced against it.'").

Honeywell contends "that the sale of a patented product *by someone other than* the patentee or his licensee does not give rise to an implied license." Pl PT Op Def at 150 (emphasis added). The patentee and the seller of the patented product, however, are now the same corporate entity. *See* Del. Code Ann. tit. 8, § 259 ("the constituent corporations shall become a new corporation, or be merged into 1 of such corporations"). Therefore, Honeywell International Inc. is bound by the same "restrictions, disabilities and duties" created by the "First Sale" Doctrine, as that of Honeywell Inc. *See Adams*, 84 U.S. at 456 ("[W]hen the patentee, or the person having his rights, sells a machine or instrument whose sole value is in its use, he receives the consideration for its use and he parts with the right to restrict that use.").

The "First Sale" Doctrine recognizes the bargained for exchange that took place: "the patentee or his assignee having in the act of sale received all the royalty or consideration which he claims for the use of his invention in that particular machine or instrument, it is open to the use of the purchaser without further restriction on account of the monopoly of the patentees." *Burke*, 84 U.S. at 456; *see also Jazz Photo Corp*. v. *Int'l Trade Comm'n*, 264 F.3d 1094, 1102 (Fed. Cir. 2001) ("[P]atented articles when sold 'become the private individual property of the purchasers, and are no longer specifically protected by the patent laws.'") (quoting *Mitchell* v. *Hawley*, 83 U.S. 544, 548 (1873)). Here, if Honeywell International Inc. were to recover damages for infringement, the court would be granting the double recovery that the "First Sale" Doctrine was designed to protect against. Accordingly, the court has determined that the "First Sale" Doctrine bars Honeywell from recovering damages from the Government for the use of the infringing CMFDs.

7. Inequitable Conduct.

To establish inequitable conduct, the court must find by clear and convincing evidence that the patent applicant breached the duty of candor and good faith, by failing to disclose material information to the PTO or submitting false material information, with an intent to deceive. *See Bruno Indep. Living Aids, Inc*. v. *Acorn Mobility Servs. Ltd.*, 394 F.3d 1348, 1351 (Fed. Cir. 2005) ("A breach of this duty may constitute inequitable conduct, which can arise from a failure to disclose information material to patentability, coupled with an intent to deceive or mislead the [examiner].") (citation omitted); *see also Monsanto Co.* v. *Bayer BioScience N.V.*, 363 F.3d 1235, 1239 (Fed. Cir. 2004) (determining that inequitable conduct can be found when the "applicant omitted or misrepresented material facts with the intention of misleading or deceiving the patent examiner[.]"). If materiality and intent are established, then the court "must balance the equities to determine

whether the patentee has committed inequitable conduct that warrants holding the patent unenforceable." *Monsanto Co.*, 363 F.3d at 1239.

Materiality can be established by demonstrating that "'a reasonable examiner would have considered such [information] important in deciding whether to allow the parent application.'" *Digital Control Inc*. v. *Charles Mach. Works*, 437 F.3d 1309, 1314 (Fed. Cir. 2006) (quoting *Dayco Prods., Inc.* v. *Total Containment, Inc*., 329 F.3d 1358, 1363 (Fed. Cir. 2003)). The United States Court of Appeals for the Federal Circuit requires trial courts to follow "the standard set forth in PTO Rule 56." *Purdue Pharma L.P.* v. *Endo Pharms., Inc*., 438 F.3d 1123, 1129 (Fed. Cir. 2006) ("In evaluating materiality, this court has consistently referred to the standard set forth in PTO Rule 56.") (citation omitted). PTO Rule 56 states:

> information that is not cumulative to information already of record or being made of record in the application, and that
>
> (1) establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or
>
> (2) . . . refutes, or is inconsistent with, a position the applicant takes in:
>
> (i) Opposing an argument of unpatentability relied on by the Office, or
>
> (ii) Asserting an argument of patentability.

37 C.F.R. § 1.56.

To establish intent, "the involved conduct, viewed in light of all the evidence, including evidence of good faith, must indicate sufficient culpability to require a finding of intent to deceive." *Digital Control Inc.*, 437 F.3d at 1319 (quotation omitted). Direct evidence of intent to deceive is not required and may be inferred from the surrounding circumstances. *See Critikon, Inc*. v. *Becton Dickinson Vascular Access*, 120 F.3d 1253, 1256 (Fed. Cir. 1997); *see also id.* ("[I]ntent may be inferred where a patent applicant knew, or should have known, that withheld information would be material to the PTO's consideration of the patent application.") (citation omitted); *Bruno Indep. Living Aids*, 394 F.3d at 1354 ("[An] inference of deceptive intent may fairly be drawn in the absence" of a "credible explanation for the non-disclosure.").

L-3 argues that on September 21, 2001, Honeywell misrepresented the inventorship of the '914 patent to the PTO and this misrepresentation was material. *See* L-3 PT Def at 76-77("Section 102(f) of the Patent Act states that a person shall be entitled to a patent unless 'he did not himself invent the subject matter sought to be patented,' 35 U.S.C. § 102(f)[.]").

On November 15, 2000, the Patent Examiner rejected all of the claims of the'269 Application based on double patenting in light of the co-pending '760 Application and the issued '637 patent.

See L-3 PT Def at 78 (citing DMX 36 at D000154) ("The issue of priority under 35 U.S.C. 102(g) and possibly 35 U.S.C. 102(f) of this single invention must be resolved."). Based on the Patent Examiner's ruling, Honeywell amended the '269 Application and argued that the inventions at issue were distinct. *Id.* at 79 (citing DMX 36 at D000440). The Patent Examiner, however, again rejected the '269 Application and '760 Application on the same grounds. *Id.* (citing DMX 36 at D000458). In response, Honeywell cancelled the '760 Application, and amended the '269 Application by adding two polarizing filters to that claim and Dr. Craig R. Scoughton's name as an inventor of these filters. *Id.* (citing DMX 36 at D000461-67). L-3 argues that these changes were material misrepresentations, because the '269 Application, as originally filed, did not name Dr. Scoughton as an inventor. *Id*. (citing DMX 37 at D000716, 712; DMX 36 at D000013). Moreover, the polarizer amendment was added solely to allow Dr. Scoughton to be added as a co-inventor. *Id.* ("Indeed, the claim limitation directed to circular polarizers remained in place only long enough to legitimately add Scoughton as an inventor, and was then immediately removed.") (citing DMX36 at D000487). L-3 also contends that Honeywell was motivated to make these misrepresentations, because any patent arising out of the '760 Application would not have expired on October 10, 2005, while a patent originating from the '269 Application would not expire until 2019. *Id.* at 81. Therefore, when cancelling the '760 Application, Honeywell added claims to the '269 Application regarding a system of temporal filtering that previously was rejected in 1987, as anticipated by U.S. Patent No. 4,209,691. This non-disclosure alone, would support a finding of inequitable conduct. *Id.* at 82-83 ("[U]nder Federal Circuit precedent, the failure to disclose the rejection would, in itself, support a finding of inequitable conduct, and is therefore highly material and further evidence of intent.") (citing *McKesson Info. Solutions, Inc*. v. *Bridge Med., Inc*., 487 F.3d 897, 924 (Fed. Cir. 2007) (affirming the district court's finding of inequitable conduct because the applicant did not properly disclose a prior decision by the PTO)).

Honeywell responds that Dr. Scoughton's name properly was added to the '269 Application, reviewed by the Patent Examiner. *See* Pl PT Op Def at 144-45. Moreover, L-3 has presented no evidence that this action amounted to inequitable conduct. *Id.* In addition, Honeywell contends that inequitable conduct must be pleaded with particularity, and L-3 never plead non-disclosure of U.S. Patent No. 4,209,691 as an affirmative defense. *Id.* at 145 ("Contrary to the requirement of RCFC 9(b), L-3 never pleaded this new theory of inequitable conduct, and it should be rejected for that reason alone."). There is no evidence that U.S. Patent No. 4,209,691 is material to the patentability of the '914 patent. *Id.* at 146. In fact, U.S. Patent No. 4,209,691 is not in the record before the court. *Id*. at 147 ("The Hunt reference is not included in L-3's Trial Exhibit L-3E-106 (Honeywell's internal file for '270 application), and that patent has not been offered or admitted in evidence. Therefore, L-3 cannot prove materiality without proffering a copy of the allegedly undisclosed prior art.").

Inequitable conduct must be plead with particularity. *See Central Admixture Pharmacy Services, Inc*. v. *Advanced Cardiac Solutions P.C.*, 482 F.3d 1347, 1356-57 (Fed. Cir. 2007) (affirming dismissal of inequitable conduct defense as lacking "the requisite particularity"); *see also Ferguson Beauregard/Logic Controls, Division of Dover Res., Inc.* v. *Mega Sys., LLC,* 350 F.3d 1327, 1344 (Fed. Cir. 2003) ("[I]nequitable conduct, while a broader concept than fraud, must be pled with particularity."); RCFC 9(b). In this case, L-3 plead prosecution laches with particularity,

but failed to identify the non-disclosure of U.S. Patent No. 4,209,691. *See* L-3 Am. Def at 2-3. Therefore, the court will not consider whether the non-disclosure of U.S. Patent No. 4,209,691 constitutes inequitable conduct.

Moreover, the court has determined that L-3 has not established by clear and convincing evidence that the addition of Dr. Scoughton as a co-inventor in the '269 Application alone amounted to inequitable conduct. L-3 relies solely on inferences drawn from the prosecution history of the '914 patent and offers no other evidence to show that correction of inventorship was an intentional and material misrepresentation. *See PerSeptive Biosystems, Inc.* v. *Pharmacia Biotech, Inc.*, 225 F.3d 1315, 1321 (Fed. Cir. 2000) ("[T]he intentional misrepresentations, omissions and half-truths to the PTO, made as a persistent course of conduct, are highly material. . . . [T]he intentional falsehoods and omissions found by the district court easily meet our oft-stated test for materiality.") (internal quotations omitted). Dr. Scoughton was added as an inventor in accordance with PTO procedures. *See* Pl PT Op Def at 144-45; *see also* MANUAL OF PATENT EXAMINING PROCEDURE § 201.03 ("37 CFR 1.48(c) is directed at correcting the inventorship where the executed oath or declaration had correctly set forth the inventorship but due to amendment of the claims to include previously unclaimed but disclosed subject matter, one or more inventors of the amended subject matter must be added to the current inventorship."). Therefore, the court has determined that L-3 failed to meet the clear and convincing evidence standard for establishing inequitable conduct.

8. Prosecution Laches.

The United States Court of Appeals for the Federal Circuit has held that "prosecution laches may render a patent unenforceable when it has issued only after an unreasonable and unexpected delay in prosecution." *Symbol Techs., Inc.* v. *Lemelson Med., Educ & Research Found., LP*, 422 F.3d 1378, 1385 (Fed. Cir. 2005) (citation omitted). In making this determination, the court should examine "the totality of the circumstances, including the prosecution history of all of a series of related patents and overall delay in issuing claims." *Id.* at 1386. Our appellate court, however, has not set "any firm guidelines for determining when such laches exist," leaving that determination to the trial court. *Id.* at 1385 (holding that there are "no strict time limitations for determining whether continued refiling of patent applications is a legitimate utilization of statutory provisions or an abuse of those provisions" and that "[t]he matter is to be decided as a matter of equity, subject to the discretion of a [trial] court before which the issue is raised"). Invoking an equitable defense, however, should only be done in "*egregious* cases of misuse of the statutory patent system." *Id.* (emphasis added).

L-3 argues that the 17-year delay in the issuance of the '914 patent supports a finding of prosecution laches, because Honeywell could have continued prosecuting the '269 Application to allowance, as they did in another application. *See* L-3 PT Def at 86. L-3 again raises the same issues as inequitable conduct defense argument, mainly that Honeywell did not prosecute the '269 Application in good faith by presenting previously rejected claims and cancelling claims that might have otherwise been allowed in favor of a claim that had been previously rejected. *Id.* at 86-87. Finally, L-3 argues that allowing Honeywell to patent the subject matter covered by claim 2 would

remove from the public domain technological advancements from the past 17 years in the field of night vision goggle compatible displays. *Id.* at 87.

Honeywell responds that the delay in issuance mainly was caused by the Secrecy Order. *See* Pl PT Op Def at 148. Honeywell also contends that it could not have continued prosecuting the '268 Application during the pendency of the Secrecy Order, because the Patent Office closed prosecution during that time. *Id.* (citing DMX 36 at D000132).

The court has determined that L-3 has failed to prove by clear and convincing evidence that the '914 patent was unenforceable due to prosecution laches. The prosecution history of the '914 patent indicates that the Patent Examiner closed the prosecution one year after the Secrecy Order, and thus any attempt by the applicant to continue prosecuting the patent would not have resulted in the patent issuing sooner. *See* DMX 36 at D000132 ("This application is now in condition for allowance, and the prosecution is now closed. However, in view of the secrecy order issued April 20, 1987, under 35 U.S.C.§ 181, this application will be withheld from issue during such period as the national interest requires."); *see also* MANUAL OF PATENT EXAMINING PROCEDURE § 130 ("When a Secrecy Order case is in condition for allowance, a notice of allowability (Form D-10) is issued, thus closing the prosecution. Any amendments received thereafter are not entered or responded to until such time as the Secrecy Order is rescinded. At such time, amendments which are free from objection will be entered; otherwise they are denied entry."). The three-year delay after the Secrecy Order was lifted is not an "egregious case[] of misuse of the statutory patent system." *Symbol Techs., Inc.*, 422 F.3d at 1386 (holding that a 18 to 39 year delay was inequitable). Accordingly, the court has determined that L-3 has failed to establish by clear and convincing evidence that the patent should be unenforceable due to prosecution laches.

III. CONCLUSION.

For the aforementioned reasons, the court has determined that claim 2 of the '914 patent was obvious and failed to meet the written description requirement of Section 112 ¶ 1 of the Patent Act. In addition, Honeywell is barred from recovering damages from the Government under the "First Sale" Doctrine.

The parties will advise the court on or before May 1, 2008 whether further proceedings are necessary, prior to the court entering a judgment that may be appealed to the United States Court of Appeals for the Federal Circuit.

IT IS SO ORDERED.

s/ Susan G. Braden
SUSAN G. BRADEN
Judge