PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C. 20436

In the Matter of **CERTAIN AUDIOVISUAL COMPONENTS AND PRODUCTS CONTAINING THE SAME**	**Investigation No. 337-TA-837**

INITIAL DETERMINATION

Administrative Law Judge David P. Shaw

Pursuant to the notice of investigation, 77 Fed. Reg. 22803 (Apr. 17, 2012), this is the Initial Determination in *Certain Audiovisual Components and Products Containing the Same*, United States International Trade Commission Investigation No. 337-TA-837.

It is held that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain audiovisual components and products containing the same, with respect to asserted claims 1, 5, 7, 8, 9, 10, 11, and 16 of U.S. Patent No. 5,870,087. It is further held that a violation of section 337 of the Tariff Act, as amended, has not occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain audiovisual components and products containing the same, with respect to asserted claims 1, 2, 3, 4, 5, 6, 7, 8, 9, and 11 of U.S. Patent No. 6,982,663; asserted claims 22, 23, 24, 25, 26, 29, 32, and 35 of U.S. Patent No. 6,452,958; or asserted claims 20, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 47, 49, 50, 51, 52, 53, 54, 55, 56, 58, 59, 60, and 61 of U.S. Patent No. 6,707,867.

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The following abbreviations or acronyms may be used in this Initial Determination:

ALJ	Administrative Law Judge
CDX	Complainants' Demonstrative Exhibit
CPX	Complainants' Physical Exhibit
CX	Complainants' Exhibit
Dep.	Deposition
EDIS	Electronic Document Imaging System
JDX	Joint Demonstrative Exhibit
JPX	Joint Physical Exhibit
JX	Joint Exhibit
MPEG	Moving Picture Experts Group
MPEP	Manual of Patent Examining Procedure
PTO	U.S. Patent and Trademark Office
RDX	Respondents' Demonstrative Exhibit
RPX	Respondents' Physical Exhibit
RWS	Rebuttal Witness Statement
RX	Respondents' Exhibit
SDX	Staff's Demonstrative Exhibit
SPX	Staff's Physical Exhibit
SX	Staff's Exhibit
Tr.	Transcript
WS	Witness Statement

I. Background

A. Institution of the Investigation; Procedural History

By publication of a notice in the *Federal Register* on April 17, 2012, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission instituted this investigation to determine:

> [W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain audiovisual components and products containing the same that infringe one or more of claims 1, 5, 7-11, and 16 of the '087 patent [U.S. Patent No. 5,870,087]; claims 1-7, 10, 11, 22-26, 29, 30, 32, 35, and 36 of the '958 patent [U.S. Patent No. 6,452,958]; claims 1, 4-7, 9-21, 23, 24, 26-40, 44, 45, 47, and 49-74 of the '867 patent [U.S. Patent No. 6,707,867]; and claims 1-11 of the '663 patent [U.S. Patent No. 6,982,663], and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

77 Fed. Reg. 22803 (Apr. 17, 2012).

The Commission named as complainants LSI Corporation of Milpitas, California, and Agere Systems Inc. of Allentown, Pennsylvania (collectively, "LSI" or "Complainants"). *Id.*

The Commission named as respondents Funai Electric Company, Ltd. of Osaka, Japan; Funai Corporation, Inc. of Rutherford, New Jersey; P&F USA, Inc. of Alpharetta, Georgia; Funai Service Corporation, of Groveport, Ohio (together, "Funai"); MediaTek Inc. of Hsinchu City, Taiwan; MediaTek USA Inc. of San Jose, California; MediaTek Wireless, Inc. of Woburn, Massachusetts (together, "MediaTek"); Ralink Technology Corporation of Hsinchu County, Taiwan; Ralink Technology Corporation (USA) of Cupertino, California (together, Ralink); and Realtek Semiconductor Corporation of Hsinchu, Taiwan ("Realtek") (collectively, "Respondents"). *Id.*

The Office of Unfair Import Investigations was not named as a party to this investigation. *Id.*

The target date for completion of this investigation was set at 16 months, *i.e.*, August 19, 2013. Order No. 3. Upon subsequent motion by the parties, the administrative law judge issued an initial determination extending the target date by three months, *i.e.*, to November 18, 2013. Order No. 47 (Oct. 25, 2012), *aff'd*, Notice of Commission Determination Not to Review an Initial Determination Extending the Target Date for Completion of the Investigation (Nov. 7, 2012).

LSI filed a motion to terminate the investigation as to MediaTek and Ralink based on the withdrawal of all allegations. The administrative law judge granted the motion in an initial determination. Order No. 57 (Jan. 24, 2013), *aff'd*, Notice of a Commission Determination Not to Review an Initial Determination Terminating the Investigation As to Certain Respondents (Feb. 13, 2013).

Funai and Realtek moved to terminate the investigation in part, *i.e.*, as to claims 1-7, 10-11, 30, and 36 of the '958 patent; claims 1, 4-7, 9-19, 21, 36, 44-45, 57, and 62-74 of the '867 patent; and claim 10 of the '663 patent. The administrative law judge granted the motion in an initial determination. Order No. 72 (Mar. 7, 2013), *aff'd*, Notice of a Commission Determination Not to Review an Initial Determination Terminating the Investigation As to Certain Claims (Mar. 26, 2013).

A prehearing conference was held on April 2, 2013, with the evidentiary hearing in this investigation commencing immediately thereafter. The hearing concluded on April 10, 2013. *See* Order No. 73; Hearing Tr. 1-2189. The parties were requested to file post-hearing briefs not to exceed 600 pages in length, and to file reply briefs not to exceed 200 pages in length. *See* Hearing Tr. 12.

B. The Private Parties; Assignment of Patents

LSI Corporation is a Delaware corporation having its principal place of business in Milpitas, California. *See* Second Am. Compl. at 5, ¶ 11. Agere Systems Inc. is a Delaware corporation having its principal place of business in Allentown, Pennsylvania. *See id.* at 6, ¶ 13.

Funai Electric Company, Ltd. is a corporation organized under the laws of Japan, and maintains its principal place of business in Osaka, Japan. *See* Funai Resp. to Second Am. Compl. at 7, ¶ 21. Funai Corporation, Inc. is a corporation organized under the laws of New Jersey, and maintains its principal place of business in Rutherford, New Jersey. *See id.* at 7, ¶ 22. P&F USA, Inc. is a corporation organized under the laws of Georgia, and maintains its principal place of business in Alpharetta, Georgia. *See id.* at 7, ¶ 23. Funai Service Corporation is a corporation organized under the laws of California, and maintains its principal place of business in Groveport, Ohio. *See id.* at 8, ¶ 24.

MediaTek Inc. is incorporated under the laws of Taiwan and maintains a principal place of business in Hsinchu City, Taiwan. *See* MediaTek Am. Resp. to Am. Compl. at 6, ¶ 25. MediaTek USA Inc. is a corporation organized under the laws of Delaware, with a principal place of business in San Jose, California. *See id.* at 6, ¶ 26. MediaTek Wireless, Inc. is a corporation organized under the laws of Massachusetts, with a principal place of business in Woburn, Massachusetts. *See id.* at 7, ¶ 27.

Ralink Technology Corporation is a corporation organized under the laws of Taiwan, with a principal place of business in Hsinchu County, Taiwan. *See* Ralink Am. Resp. to Am. Compl. at 8, ¶ 28. Ralink Technology Corporation is a corporation organized under the laws of California. *See id.*

Realtek Semiconductor Corporation is a corporation organized under the laws of Taiwan, with its principal place of business in Hsinchu County, Taiwan. *See* Realtek's Resp. to Second Am. Compl. at 6, ¶ 29.

The '087 patent is assigned to LSI Logic Corporation. JX-0001 ('087 patent).

The '663 patent is assigned to LSI Logic Corporation. JX-0007 ('663 patent).

The '958 patent is assigned to Agere Systems Guardian Corp. JX-0003 ('958 patent).

The '867 patent is assigned to Agere Systems, Inc. JX-0005 ('867 patent).

II. Jurisdiction

No party has contested the Commission's personal jurisdiction over it. *See, e.g.*, Compls. Br. at 58; Resps. Br at 15. Indeed, all parties appeared at the evidentiary hearing, and presented evidence. It is found that the Commission has personal jurisdiction over all parties.

No party has specifically contested the Commission's *in rem* jurisdiction over the accused products. *See, e.g.*, Compls. Br. at 51; Resps. Br at 15. Complainants have based their importation arguments on completed acts of importation. Accordingly, it is found that the Commission has *in rem* jurisdiction over all products accused under the asserted patents.

No party has contested the Commission's jurisdiction over the subject matter of this investigation. *See, e.g.*, Compls. Br. at 50-51; Resps. Br at 15. Indeed, as indicated in the Commission's notice of investigation, discussed above, this investigation involves the alleged importation of products that infringe United States patents in a manner that violates section 337 of the Tariff Act, as amended. Accordingly, it is found that the Commission has subject matter jurisdiction over this investigation.

III. Importation of the Accused Products

As indicated in the notice of investigation, quoted above, this investigation was instituted to determine whether a violation of section 337 has occurred in "the importation into the United States, the sale for importation, or the sale within the United States after importation" of certain products. *See* 76 Fed. Reg. 54252 (Aug. 31, 2011); 19 U.S.C. § 1337(a)(1)(B) (making unlawful, in certain circumstances, the "importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that . . . infringe a valid and enforceable United States patent . . . ."). It has long been recognized that an importation of even one accused product can satisfy the importation requirement of section 337. *See Certain Trolley Wheel Assemblies*, Inv. No. 337-TA-161, Comm'n Op. at 7-8, USITC Pub. No. 1605 (Nov. 1984) (deeming the importation requirement satisfied by the importation of a single product of no commercial value).

Moreover, a complainant does not need to prove that a respondent imported the accused products itself. "[L]ongstanding Commission precedent holds that a section 337 violation can be found when a foreign manufacturer sells infringing goods to a foreign trading company with the knowledge that the goods will subsequently be exported to the United States, even if the manufacturer does not itself export or deal directly with U.S. importers." *Certain Battery-Powered Ride-On Toy Vehicles*, Inv. No. 337-TA-314, USITC Pub. No. 2420, Comm'n Op. at 4-5 (Aug. 1991). In *Certain Battery-Powered Ride-On Toy Vehicles*, the Commission determined that the finding of the administrative law judge that respondents knew a third party was exporting to the United States compelled the legal conclusion that section 337's importation requirement had been satisfied. *Id.* at 5.

The accused products in this investigation are listed in a joint filing required by the procedural schedule. *See* Order No. 4 (requiring a "joint statement regarding identification of accused products"). By listing a product in the joint filing, Respondents have not admitted infringement. Nevertheless, the joint filing indicates the final extent of Complainants' accusations in this investigation. *See* Joint Statement Regarding Identification of Accused Products (EDIS Doc. No. 490897) ("Joint Statement of Accused Products").

With respect to the Funai accused products, Complainants argue that the evidence shows that the importation requirement has been satisfied. Compls. Br. at 53-57. Complainants provide the following chart purporting to identify "specific evidence and testimony conclusively establishing importation of the accused downstream products by Funai":

Funai	Evidence and Testimony
[	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2012 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 15; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 17; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 84:12-15;
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 15; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 9; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
]	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25

Funai	Evidence and Testimony
[	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 11; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 15; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 86:19-22
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 9; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 15; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 13; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 9; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 18; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 16; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
]	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25

Funai	Evidence and Testimony
[	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 17; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0037C (Sept. 26, 2012 Leungen Dep.) at 39:9-18
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 3; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 3; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0037C (Sept. 26, 2012 Leungen Dep.) at 39:9-18
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 14; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 17; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 5; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 17; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0037C (Sept. 26, 2012 Leungen Dep.) at 40:11-21
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 5; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 19; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 11; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 17; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 25; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 5; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
]	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 17; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25

Funai	Evidence and Testimony
[	JX-0037C (Sept. 26, 2012 Leungen Dep.) at 42:10-20
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 5; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 31; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 13; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 7; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 90:6-13; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 90:6-13; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 90:6-13; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 7; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 3; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 3; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 21; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 20; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 20; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 91:17-22; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 91:17-22 JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
]	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 91:17-22; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17

Funai	Evidence and Testimony
[	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 91:17-22; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21:1-17
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 35; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 3; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
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	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 20; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 20; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 3; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25
	JX-0030C (Sept. 26, 2012, Kanazawa Dep.) at 94:16-95:1.
]	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 31; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25

Funai	Evidence and Testimony
[ ]	RPX-1C; RPX-4C; RPX-5C; RX-2463C at pg. 20; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 44:8-93:2, and 96:8-124:25

Compls. Br. at 53-57 (formatting added).

Funai, however, argues that Complainants have failed to prove infringement of the Funai accused products:

> As an initial matter, there are [ ] Funai products listed on the Joint Statement of Accused Products. [ ] of those products have already been removed from the case. Order No. 67. For [ ] of the remaining products, Complainants made no attempt to prove infringement at the hearing (*see* Section XII.A.1.c.). For these products, evidence that the importation prong has been satisfied is irrelevant. *Electronic Devices,* Inv. No. 337-TA-724, Comm'n Op. at 16, 2011 ITC LEXIS 2869 (Dec. 21, 2011). For the remaining [ ] products, Complainants failed to offer a single line of testimony, in either their witness statements or on cross-examination, to prove that the products at issue have actually been imported into the United States. Like any other element of a § 337 violation, importation cannot be simply "assumed" – it must be affirmatively proven. Complainants have not done so here, and without such evidence can not show that Funai has violated § 337.

Resps. Br. at 28.

A review of the record evidence cited by Complainants shows that Funai has imported into the United States, sold for importation into the United States, or sold after importation into the United States the accused downstream products, with a cumulative value of [

]. *See* JX-0030C (Sept. 26, 2012 Y. Kanazawa Dep.) at 80-95; JX-0030C (Jan. 16, 2013 Y. Kanazawa Dep.) at 12-15, 18-23, 29-30, 44-93, 96-124; JX-0037C (Sept. 26, 2012 Leungen Dep.) at 18-25, 36-45; RX-0008C (Vander Veen WS) at Q&A 120; RPX-0004; RPX-0005; RPX-0006; RPX-0007; RX-2463C at Responses to Interrogatory No. 1. In particular, Funai's accused downstream products are imported through at least the following ports: [

]. CX-0818C at Response to Interrogatory No. 37.

In addition, Funai identifies several products destined for the United States with an [ ] suffix. JX-0037C (Sept. 26, 2012 Leungen Dep.) at 21. It is therefore determined that the importation requirement of section 337 has been satisfied with respect to the accused Funai products.

With respect to the accused Realtek products, the administrative law judge previously determined that the following products have been imported into the United States: [

] Order No. 71 (Mar. 5, 2013) (unreviewed). As for the remaining Realtek accused produts, Realtek argues:

> Complainants have introduced no evidence of importation of any other Realtek product. Thus, to find a violation of 19 U.S.C. § 1337(a)(1)(B), Complainants must demonstrate that one or more of those accused Realtek products identified above infringe a valid and enforceable asserted claim, a finding that Realtek disputes.

Compls. Br. at 27.

The record evidence, however, establishes that the Realtek products at issue have been imported into the United States. *See* JX-0053C [ ] at 77-79, 81, 103-107; CX-421C; CX-422C. As identified in CX-421C and CX-422C, and as confirmed [ ] the following additional products have been imported directly into the United States: [

] JX-0053C [ ] at 77-79, 81, 103-107; CX-421C; CX-422C. Additionally, Realtek accused products have been imported [

] *See* CX-0518C Response to Interrogatory No. 70. Accordingly, it is determined that the importation requirement of section 337 has been satisfied with respect to the accused Realtek products.

IV. Relevant Summary Determination Rulings

On February 26, 2013, the administrative law judge granted summary determination of non-infringement for the following Funai model numbers:

- [
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-
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-
-
-
-]

Order No. 67, *aff'd*, Notice of Commission Determination Not to Review Order No. 67 Granting Respondents' Motion for Summary Determination of Non-Infringement (Mar. 27, 2013).

On March 5, 2013, the administrative law judge granted summary determination that the importation requirement of section 337 had been satisfied as to the following Realtek products:

- [
-
-
-]

Order No. 71, *aff'd*, Notice of a Commission Determination Not to Review an Initial Determination Granting-in-Part Complainants' Motion for Summary Determination of Importation of Certain Accused Products (Apr. 2, 2013).

V. The '087 Patent

A. The Asserted Claims and Accused Products

Asserted U.S. Patent No. 5,870,087 ("the '087 patent") is titled, "MPEG Decoder System and Method Having a Unified Memory for Transport Decode and System Controller Functions." JX-0001 ('087 patent). The '087 patent issued on February 9, 1999, and the named inventor is

Kwok Kit Chau. *Id.* The '087 patent relates generally to "[a]n MPEG decoder system and method for performing video decoding or decompression which includes a unified memory for multiple functions." *Id.* at Abstract.

LSI asserts independent claims 1, 10, and 16, as well as dependent claims 5, 7, 8, 9, and 11 against Funai. These claims read as follows:

> **1.** An MPEG decoder system which includes a single memory for use by transport, decode and system controller functions, comprising:
>
> a channel receiver for receiving and MPEG encoded stream;
>
> transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream;
>
> a system controller coupled to the transport logic which controls operations within the MPEG decoder system;
>
> an MPEG decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the MPEG decoder operates to perform MPEG decoding on the multimedia data streams; and
>
> a memory coupled to the MPEG decoder, wherein the memory is used by the MPEG decoder during MPEG decoding operations, wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the MPEG decoder system, wherein the memory is used by the transport logic for demultiplexing operations;
>
> wherein the MPEG decoder is operable to access the memory during MPEG decoding operations;
>
> wherein the transport logic is operable to access the memory to store and retrieve data during demultiplexing operations; and
>
> wherein the system controller is operable to access the memory to retrieve code and data during system control functions.
>
> **5.** The MPEG decoder system of claim 1, wherein the memory stores anchor frame data during reconstruction of temporally compressed frames.

7. The MPEG decoder system of claim 1, wherein said memory includes a plurality of memory portions, wherein said memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic.

8. The MPEG decoder system of claim 7, wherein said memory further includes a video decode buffer portion for storing decoded video data, a video display sync buffer, and an on-screen display buffer.

9. The MPEG decoder system of claim 8, wherein said memory further includes one or more audio buffers for storing audio data.

10. A method for performing video decoding in an MPEG decoder system which includes a single memory for use by transport, decode and system controller functions, the method comprising:

receiving an MPEG encoded stream;

demultiplexing one or more multimedia data streams from the encoded stream, wherein said demultiplexing one or more multimedia data streams from the encoded stream operates using a first unified memory;

performing MPEG decoding on the multimedia data streams, wherein said performing MPEG decoding operates using said first unified memory; and

a system controller controlling operations within the MPEG decoder system, wherein said controlling operations accesses code and data from said first unified memory;

wherein said demultiplexing one or more multimedia data streams, said performing MPEG decoding, and said controlling operations each use said first unified memory.

11. The method of claim 10,

wherein said demultiplexing one or more multimedia data streams from the encoded stream includes accessing multimedia data stream data from said first unified memory;

wherein said performing MPEG decoding on the multimedia data streams includes accessing video frame data from said first unified memory; and

wherein said controlling operations includes accessing code and data from said first unified memory.

16. A video decoder system which includes a single memory for use by transport, decode and system controller functions, comprising:

a channel receiver for receiving an encoded video stream;

transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream;

a system controller coupled to the transport logic which controls operations within the video decoder system;

a video decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the video decoder operates to perform video decoding on the multimedia data streams; and

a memory coupled to the video decoder, wherein the memory is used by the video decoder during video decoding operations, wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the video decoder system, wherein the memory is used by the transport logic for demultiplexing operations;

wherein the video decoder is operable to access the memory during video decoding operations;

wherein the transport logic is operable to access the memory to store and retrieve data during demultiplexing operations; and

wherein the system controller is operable to access the memory to retrieve code and data during system control functions.

JX-0001 at col. 17, lns. 15-46; col. 17, lns. 63-65; col. 18, lns. 1-44; col. 19, ln. 6 – col. 20, ln. 6.

Complainants accuse the following Funai products, identified by buyer model number, of infringing the asserted claims of the '087 Patent: [

].[1] Compls. Br. at 42-43 (citing CX-1594C (Acton WS) at 6).

B. Claim Construction

1. General Principles of Law[2]

Claim construction begins with the plain language of the claim.[3] Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent.[4] *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).

In some instances, claim terms do not have particular meaning in a field of art, and claim construction involves little more than the application of the widely accepted meaning of

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[1] Funai requests that the administrative law judge enter a finding of non-infringement for any remaining products listed on the Joint Statement of Accused Products for which Complainants have not specifically provided evidence of infringement. *See* Resps. Br. at 430 n.74. There is no requirement that a complainant must accuse all products identified on a joint statement of accused products of infringing every patent asserted in an investigation. The administrative law judge therefore declines to find that the remaining products listed on the Joint Statement of Accused Products do not infringe the '087 patent. For similar reasons, the administrative law judge declines to make a similar finding of non-infringement for the '663, '958, and '867 patents. *See* Resps. Br. at 66 n.7, 357 n.63.

[2] The legal principles set forth in this section apply equally to the claim construction of the other patents asserted in this investigation.

[3] Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l Trade Comm.*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

[4] Factors that may be considered when determining the level of ordinary skill in the art include: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

commonly understood words. *Phillips*, 415 F.3d at 1314. "In such circumstances, general purpose dictionaries may be helpful." *Id.*

In many cases, claim terms have a specialized meaning, and it is necessary to determine what a person of skill in the art would have understood the disputed claim language to mean. "Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to 'those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean.'" *Id.* (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). The public sources identified in *Phillips* include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id.*

In cases in which the meaning of a claim term is uncertain, the specification usually is the best guide to the meaning of the term. *Id.* at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Id.* at 1316.

Claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir.

2003); *Decisioning.com, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) ("[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims."). Nevertheless, claim constructions that exclude the preferred embodiment are "rarely, if ever, correct and require highly persuasive evidentiary support." *Vitronics*, 90 F.3d at 1583. Such a conclusion can be mandated in rare instances by clear intrinsic evidence, such as unambiguous claim language or a clear disclaimer by the patentees during patent prosecution. *Elekta Instrument S.A. v. O.U.R. Sci. Int'l, Inc.*, 214 F.3d 1302, 1308 (Fed. Cir. 2000); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319 (Fed. Cir. 2002).

If the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence may be considered. Extrinsic evidence consists of all evidence external to the patent and the prosecution history, and includes inventor testimony, expert testimony, and learned treatises. *Phillips*, 415 F.3d at 1317. Inventor testimony can be useful to shed light on the relevant art. In evaluating expert testimony, a court should discount any expert testimony that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent. *Id.* at 1318. Extrinsic evidence may be considered if a court deems it helpful in determining the true meaning of language used in the patent claims. *Id.*

2. Level of Ordinary Skill

A person of ordinary skill in the relevant art at the time of the invention of the '087 patent would be someone with a bachelor's degree in electrical engineering, computer engineering, computer science or equivalent and at least two of years of industry experience or graduate

studies in developing image/video processing software/hardware systems.[5] *See* CX-1594C (Acton WS) at 6, Q&A 37.

3. "single memory" / "memory" and "single memory" / "first unified memory"

Below is a chart showing the parties' proposed claim constructions.[6]

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"single memory" "memory" "first unified memory"	"memory functioning as a unit"	"a single unified memory which stores code and data for the transport, logic, system controller and MPEG decoder functions, with reduced memory requirements compared to prior art designs (*i.e.*, less than 20 or 24 Mbits)"

The claim terms "single memory" and "memory" are recited in asserted claims 1, 5, 7-9, and 16 of the '087 patent, and the claim terms "single memory" and "first unified memory" are recited in asserted claims 10 and 11 of the '087 patent. Complainants argue that these terms

[5] Respondents propose that a person of ordinary skill in the art relevant to the '087 patent at the time of the invention would have a bachelor's degree in electrical engineering, computer engineering, computer science, or the equivalent and 2 years of work experience in the area of multimedia compression, including the implementation of digital video coding and decoding systems. Resps. Br. at 391 (citing RX-0007C (Schonfeld WS) at Q&A 13). The parties have not identified any way in which differences in their proposed definitions of the level of ordinary skill in the art affect issues in this investigation. *See id.*

[6] This Initial Determination addresses only the disputed claim terms identified by the parties as needing construction. *See* Parties' Joint Submission Pursuant to Ground Rule 12 (EDIS Doc. No. 508350) ("GR12 Filing"). The parties identified the claim terms for construction in a joint filing required by Ground Rule 12, which provides: "On the same day the initial posthearing briefs are due, the parties shall file a comprehensive joint outline of the issues to be decided in the final Initial Determination. The outline shall refer to specific sections of the posthearing briefs. Moreover, the claim terms briefed by the parties must be identical. For example, if the construction of the claim term 'wireless device' is disputed, the parties must brief that exact claim term. If a party briefs only a portion of the claim term such as 'wireless' or 'device,' that section of the brief will be stricken." Ground Rule 12 (emphasis original) (attached to Order No. 64 (Issuance of Amended Ground Rules)).

should be construed to mean "memory functioning as a unit." *See* Joint List of Disputed Claim Terms and Proposed Constructions (EDIS Doc. No. 490897) ("Joint List of Proposed Claim Constructions").[7] Respondents argue that these terms should be construed to mean "a single unified memory which stores code and data for the transport logic, system controller and MPEG decoder functions, with reduced memory requirements compared to prior art designs (*i.e.*, less than 20 or 24 Mbits)." Resps. Br. at 399-400.

As proposed by Complainants, the claim terms "single memory" / "memory" and "single memory" / "first unified memory" are construed to mean "memory functioning as a unit," which is a construction supported by the intrinsic evidence.

The specification of the '087 patent uses the terms "memory," "single memory," and "unified memory" interchangeably. *See* JX-0001 ('087 patent) at col. 5, ln. 6 – col. 6, ln. 27. These terms are used throughout the specification to indicate that the memory of the video decoder system functions as a unit. Moreover, the specification indicates that the claimed memory is not limited to a single chip. As seen in at FIG. 3 of the '087 patent, the 16-Mbit SDRAM identified by reference number 212 is depicted as four rectangles coupled together. This representation of memory 212 is consistent with four ranks (*i.e.*, chips) of memory coupled together to from a unified 16-Mbit SDRAM. *See* CX-1594C (Acton WS) at Q&A 49. That the claimed memory is not limited to one memory chip is further confirmed by FIG. 4, which depicts frame store memory 212 as comprising two memory chips functioning as a unit. As with the memory 212 shown in FIG. 3, if the claimed memory of the '087 patent were limited to a single memory chip, the frame store memory 212 in FIG. 4 would have been depicted with a single

[7] The parties agree that these claim terms should be construed identically. *See* Joint List of Proposed Claim Constructions.

block, rather than the two blocks shown. *See* CX-1640C (Acton RWS) at Q&A 72. Accordingly, the specification of the '087 patent does not limit the memory to any particular configuration so long as the resulting memory functions as a unit.

The prosecution history of the '087 patent (JX-0002 ('087 file history)) is consistent with the adopted construction. Throughout the application process, the patentee's correspondence with the U.S. Patent and Trademark Office with respect to the claimed memory was consistent with the way in which the specification references the memory. The patentee did not ascribe a specific definition to the terms "memory," "single memory," or "unified memory" that would impart to those terms a meaning different from the plain and ordinary meaning, *i.e.*, "memory functioning as a unit."

Respondents' proposed construction, "a single unified memory which stores code and data from the transport logic, system controller and MPEG decoder functions, with reduced memory requirements compared to prior art designs (*i.e.*, less than 20 or 24 Mbits)," is not supported by the claims or the specification of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 77. In the '087 specification, the reference to a 20 or 24 Mbit memory is a specific example of the practical benefits accruing from using the unified memory disclosed in the '087 patent in contrast to the prior art systems, and should not be read into the claims as a limitation. *See* CX-1594C (Acton WS) at Q&A 90-92.

Nothing in the '087 patent limits the claimed "unified memory" to a particular size. The '087 patent does disclose that combining the memory block for the transport and system controller blocks in a video decoder system implementing a unified memory leads to advantages over prior art video decoders. As stated in the '087 patent:

> Prior art MPEG video decoder systems have generally used a frame store memory for the MPEG decoder motion compensation logic which stores the reference frames or anchor frames as well as the frame being reconstructed. Prior art MPEG video decoder systems have also generally included a separate memory for the transport and system controller functions. It has generally not been possible to combine these memories, due to size limitations.

JX-0001 ('087 patent) at col. 4, lns. 28-36. The combination (*i.e.*, unification) of the two memory structures employed by prior art decoders reduces "the memory requirements of the decoder system as much as possible to reduce its size and cost." *Id.* at col. 4, lns. 45-47. "Therefore, a new video decoder system and method is desired which *efficiently uses memory and combines the memory subsystem* for reduced memory requirements and hence reduced cost." *Id.* at col. 4, lns. 59-62 (emphasis added).

Appropriately, the specification also offers a specific example of the practical benefits of using unified memory instead of the prior art systems:

> For example, current memory devices are fabricated on an 4 Mbit granularity. In prior art systems, the memory requirements for the transport and system controller functions as well as the decoder motion compensation logic would exceed 16 Mbits of memory, thus requiring 20 or 24 Mbits of memory. This additional memory adds considerable cost to the system.
>
> The amount of memory is a major cost item in the production of video decoders. Thus, it is desired to reduce the memory requirements of the decoder system as much as possible to reduce its size and cost. *Since practical memory devices are implemented using particular convenient discrete sizes, it is important to stay within a particular size if possible for commercial reasons.*

Id., col. 4, lns. 38-50 (emphasis added). Therefore, the '087 patent includes a non-limiting example of how a designer of a video decoder system could utilize the invention of the '087 patent to produce a more efficient video decoder utilizing only 16 Mb of memory when 20 or 24 Mb of non-unified memory would have been required in the prior art systems. As a result, the

description in the specification of the '087 patent of a video decoder system employing a unified memory module of 16 Mb is merely a preferred embodiment, and thus does not narrow the scope of the asserted claims.

Moreover, neither the specification of the '087 patent nor its prosecution history contains any statements limiting the size of the unified memory, and Respondents' citation to an [ ] [ ] for the '087 patent in support of Funai's disclaimer argument cannot overcome this fact. *See* Resps. Br. at 410-11. As an initial matter, what an inventor states [ ] has no bearing on the question of whether there has been a disavowal of claim scope in the intrinsic record. *See Elbex Video, Ltd. v. Sensormatic Elecs. Corp.*, 508 F.3d 1366, 1371-72 (Fed. Cir. 2007). Even if [ ] were relevant to the issue of claim construction, the portion [ ] cited by Respondents only describes the significance of the invention in one particular application, stating:

[

].

CX-1593C (087 Internal Prosecution File) at 155 (emphasis added). Instead of supporting Funai's disclaimer argument, the above-quoted passage supports the conclusion that the '087 inventor was not targeting a particular memory size, but rather looking for relative improvement over existing prior art systems.

Accordingly, the claim terms "single memory" / "memory" and "single memory" / "first unified memory" are construed to mean "memory functioning as a unit," which is a construction supported by the intrinsic evidence.

4. "wherein the memory . . ."

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the . . . decoder system"	No construction necessary.	"all code and data used by the system controller to perform control functions within the video decoder system is stored in a single memory"

The claim term "wherein the memory stores code and data usable by the system controller which enables the system controller to perform control functions within the MPEG decoder system," appears in asserted claim 1 of the '087 patent, and the claim term "wherein the memory stores code and data usable by the system controller which enables the system controller to perform control functions within video decoder system" appears in asserted claim 16. Complainants argue that the plain and ordinary meaning of these terms to a person of ordinary skill in the art is clear on their face, and that these terms do not need construction. *See* Compls. Br. at 64-65 (citing CX-1594C (Acton WS) at Q&A 96). Respondents argue that these terms should be construed to mean "all code and data used by the system controller to perform control functions within the video decoder system is stored in a single memory." *See* Resps. Br. at 419-23.

The administrative law judge declines to adopt Respondents' proposed construction. Nothing in either the specification of the '087 patent or its prosecution history would require "all" of the code and data used by the system controller to perform control functions within the video decoder system to be stored in a single memory. Moreover, Respondents' proposed construction is contrary to the plain language of '087 patent. Specifically, at column 8, line 29 of the specification, the '087 patent discloses: "The transport and system controller block 204 also

includes a system controller 208 which monitors the MPEG system and is programmable to display audio/graphics on the screen and/or execute interactive applets or programs which are embedded in the MPEG stream. The system controller 208 also preferably controls operations in the MPEG decoder system." Thus, the specification makes clear that all relevant code and data are not necessarily stored in a single memory device.

The '087 patent further discloses that during operation of the MPEG decoder system certain information, *i.e.*, reference block information, is stored in a local or on-chip memory 316. JX-0001 ('087 patent) at col. 12, lns. 35-36. This portion of the specification makes clear that on-chip memory 316, which includes data used by the system controller, is distinct from unified memory 212. *See* CX-1594C (Acton WS) at Q&A 101.

Respondents' argue that their proposed construction of the "wherein the memory . . ." limitations should be adopted because, *inter alia*, "the code and data must all be stored on the single unified memory because there is no other memory." *See* Resps. Br. at 420. The specification of the '087 patent discloses, however, that additional, specialized memories may be involved in the video decoding process. In particular, the '087 patent teaches that the motion compensation block, which analyzes each motion vector from the incoming temporally compressed data and retrieves a reference block from the frame store memory 212 in response to each motion vector, "includes a local on-chip memory 116 which stores the retrieved reference block. The motion compensation block 110 then uses this retrieved reference block to decompress the temporally compressed data." JX-0001 ('087 patent) at col. 12, lns. 48-56. In other words, the frame store memory 212 (*i.e.*, the unified memory 212) is not the only memory in the video decoding system.

Accordingly, it is determined that the claim terms "wherein the memory stores code and data usable by the system controller which enables the system controller to perform control functions within the MPEG decoder system" and "wherein the memory stores code and data usable by the system controller which enables the system controller to perform control functions within video decoder system" should be given their plain and ordinary meaning as understood by a person of ordinary skill in the art.

5. "controlling operations accesses code and data from said first unified memory"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"controlling operations accesses code and data from said first unified memory"	No construction necessary. Alternatively, "system controller programmed to access the first unified memory"	"system controller programmed to exclusively read from and write to the unified memory"

The claim term "controlling operations accesses code and data from said first unified memory" appears in asserted claim 10 of the '087 patent. Complainants argue that no construction of this term is necessary, and that this term should be given its plain and ordinary meaning. *See* Compls. Br. at 65-67. If it is determined that this term should be construed, Complainants propose the alternate construction of "system controller programmed to access the first unified memory." *Id.* at 65-66 n.10. Respondents argue that this term should be construed to mean "system controller programmed to exclusively read from and write to the unified memory." *See* Resps. Br. at 423-27.

The administrative law judge declines to adopt Respondents' proposed construction. Respondents' proposed construction of "system controller programmed to exclusively read from and write to the unified memory" does not make sense in the context of the '087 claims. Using

Respondents' proposed construction, the claim term "a system controller controlling operations within the MPEG decoder system, wherein said controlling operations accesses code and data from said first unified memory," for example, would read "a system controller controlling operations within the MPEG decoder system, wherein said system controller [is] programmed to exclusively read from and write to the unified memory." A system controller that is "programmed to exclusively read from and write to the unified memory" as proposed by Respondents cannot also control operations within the MPEG decoder system as required by claims 1, 10, and 16. *See* CX-1594C (Acton WS) at Q&A 111, Q&A 120.

The specification of the '087 patent indicates that the system controller monitors the MPEG system and is programmable to display audio and graphics on the screen and/or execute interactive applets or programs that are embedded in the MPEG stream. JX-0001 ('087 patent) at col. 8, lns. 30-33. If the system controller were configured only to read from or write to the unified memory, it would not be able to display audio or graphics or execute programs that may be in the MPEG stream. *See* CX-1594C (Acton WS) at Q&A 111, Q&A 120.

Therefore, it is determined that the claim term "controlling operations accesses code and data from said first unified memory" should be given its plain and ordinary meaning as understood by a person of ordinary skill in the art.

6. "operable to access the memory"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"operable to access the memory"	No construction necessary. Alternatively, "configured to access the memory"	"configured to exclusively read from and write to the single memory"

The claim term "operable to access the memory" appears in asserted claims 1 and 16 of the '087 patent. Complainants argue that no construction of this term is necessary, and that this term should be given its plain and ordinary meaning. *See* Compls. Br. at 65-67. If it is determined that this term should be construed, Complainants propose the alternate construction of "configured to access the memory." *Id.* at 65-66 n.10. Respondents argue that this term should be construed to mean "configured to exclusively read from and write to the single memory." *See* Resps. Br. at 427-28.

The administrative law judge declines to adopt Respondents' proposed construction. If Respondents' proposed constructions were adopted, the demultiplexing operation taught in the '087 patent would not separate one or more multimedia data streams from the encoded stream, and the MPEG decoding would not result in any decoding, because the demultiplexer and the decoder would only be capable of reading from and writing to the memory. *See* CX-1594C (Acton WS) at Q&A 126-28. Application of Respondents' proposed construction, therefore, would lead to nonsensical results. *See id.*

Therefore, it is determined that the claim term "operable to access the memory" should be given its plain and ordinary meaning as understood by a person of ordinary skill in the art.

7. "operates using a first unified memory" / "operates using said first unified memory"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"operates using a first unified memory" "operates using said first unified memory"	No construction necessary. Alternatively, "operates by accessing a first unified memory" / "operated by accessing the first unified memory"	"configured to exclusively read from and write to the first unified memory"

The claim terms "operates using a first unified memory" and "operates using said first unified memory" appears in asserted claim 10 of the '087 patent. Complainants argue that no construction of these terms is necessary, and that these terms should be given its plain and ordinary meaning. *See* Compls. Br. at 65-67. If it is determined that these terms should be construed, Complainants propose the alternate constructions of "operates by accessing a first unified memory" and "operated by accessing the first unified memory," respectively. *Id.* at 65-66 n.10. Respondents argue that these terms should be construed to mean "configured to exclusively read from and write to the single memory." *See* Resps. Br. at 428.

For the same reasons discussed above with respect to the claim term "operable to access the memory," the administrative law judge declines to adopt Respondents' proposed constructions. It is determined that the claim terms "operates using a first unified memory" and "operates using said first unified memory" should be given their plain and ordinary meaning as understood by a person of ordinary skill in the art.

C. Infringement

1. General Principles of Law[8]

a. Direct Infringement

Under 35 U.S.C. §271(a), direct infringement consists of making, using, offering to sell, or selling a patented invention without consent of the patent owner. The complainant in a section 337 investigation bears the burden of proving infringement of the asserted patent claims by a "preponderance of the evidence." *Certain Flooring Products*, Inv. No. 337-TA-443,

[8] The legal principles set forth in this section apply equally to the infringement analysis of the other patents asserted in this investigation.

Comm'n Notice of Final Determination of No Violation of Section 337, 2002 WL 448690, at *59, (Mar. 22, 2002); *Enercon GmbH v. Int'l Trade Comm'n*, 151 F.3d 1376 (Fed. Cir. 1998).

Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.*, when the properly construed claim reads on the accused device exactly.[9] *Amhil Enters., Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. "Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 609 (1950)). "The determination of equivalence should be applied as an objective inquiry on an element-by-element basis."[10] *Id.* at 40.

"An element in the accused product is equivalent to a claim limitation if the differences between the two are insubstantial. The analysis focuses on whether the element in the accused device 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374,

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[9] Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). If an accused device lacks a limitation of an independent claim, the device cannot infringe a dependent claim. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n.9 (Fed. Cir. 1989).

[10] "Infringement, whether literal or under the doctrine of equivalents, is a question of fact." *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

1382 (Fed. Cir. 2005) (quoting *Graver Tank*, 339 U.S. at 608); *accord Absolute Software*, 659 F.3d at 1139-40.[11]

Prosecution history estoppel can prevent a patentee from relying on the doctrine of equivalents when the patentee relinquished subject matter during the prosecution of the patent, either by amendment or argument. *AquaTex*, 419 F.3d at 1382. In particular, "[t]he doctrine of prosecution history estoppel limits the doctrine of equivalents when an applicant makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to an examiner." *Id.* (quoting *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005)).

b. Induced Infringement

With respect to induced infringement, section 271(b) of the Patent Act provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b). "To prevail on a claim of induced infringement, in addition to inducement by the defendant, the patentee must also show that the asserted patent was directly infringed." *Epcon Gas Sys. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1033 (Fed. Cir. 2002). Further, "[s]ection 271(b) covers active inducement of infringement, which typically includes acts that intentionally cause, urge, encourage, or aid another to directly infringe a patent." *Arris Group v. British Telecomms. PLC*, 639 F.3d 1368, 1379 n.13 (Fed. Cir. 2011). The Supreme Court recently held that "induced infringement under § 271(b) requires knowledge that the induced acts constitute

[11] "The known interchangeability of substitutes for an element of a patent is one of the express objective factors noted by *Graver Tank* as bearing upon whether the accused device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge." *Warner-Jenkinson*, 520 U.S. at 36.

patent infringement." *Global-Tech Appliances, Inc. v. SEB S.A.*, -- U.S. --, 131 S. Ct. 2060, 2068 (2011). The Court further held: "[g]iven the long history of willful blindness[ ] and its wide acceptance in the Federal Judiciary, we can see no reason why the doctrine should not apply in civil lawsuits for induced patent infringement under 35 U.S.C. § 271(b)." 131 S.Ct. at 2060 (footnote omitted).

c. Contributory Infringement

As for contributory infringement, section 271(c) of the Patent Act provides: "Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer." 35 U.S.C. § 271(c).

Section 271(c) "covers both contributory infringement of system claims and method claims." *Arris*, 639 F.3d at 1376 (footnotes omitted). To hold a component supplier liable for contributory infringement, a patent holder must show, *inter alia*, that (a) the supplier's product was used to commit acts of direct infringement; (b) the product's use constituted a material part of the invention; (c) the supplier knew its product was especially made or especially adapted for use in an infringement" of the patent; and (d) the product is not a staple article or commodity of commerce suitable for substantial noninfringing use. *Id.*

d. Infringement of Method Claims Under *Electronic Devices*

The Commission's opinion in *Certain Electronic Devices with Image Processing Systems, Components Thereof, and Associated Software*, Inv. No. 337-TA-724, Comm'n Op.

(Dec. 21, 2011) ("*Electronic Devices*"), holds that the practice of an asserted method claim within the United States after importation cannot serve as the basis for an exclusion order. *Electronic Devices*, Comm'n Op. at 17. As discussed in *Electronic Devices*, section 337 prohibits:

> (B) The importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that –
>
> (i) infringe a valid and enforceable United States patent or a valid and enforceable United States copyright registered under title 17; or
>
> (ii) are made, produced, processed, or mined under, or by means of, a process covered by the claims of a valid and enforceable United States patent.

19 U.S.C. § 1337(a)(1)(B).

The statute is violated only by the importation, sale for importation, or sale after importation of articles that either infringe a valid U.S. patent claim or are made by a method covered by a valid U.S. patent claim. An article, standing alone, cannot directly infringe a method claim. *Electronic Devices*, Comm'n Op. at 17; *see also Cardiac Pacemakers, Inc. v. St. Jude Medical, Inc.*, 576 F.3d 1348, 1364 (Fed. Cir. 2009). A method claim is infringed only where someone performs all of the claimed method steps. *See NTP v. Research in Motion, Ltd.*, 418 F.3d 1282, 1318 (Fed. Cir. 2005) ("[T]he use of a [claimed] process necessarily involves doing or performing each of the steps recited."); *Joy Techs., Inc. v. Flakt, Inc.*, 6 F.3d 770, 775 (Fed. Cir. 1993) ("A method claim is directly infringed only by one practicing the patented method.").

In *Electronic Devices*, the Commission ruled that complainant did not have a legally cognizable claim that respondent violated the statute by using articles within the United States when infringement allegedly occurred by virtue of that use. *Electronic Devices*, Comm'n Op. at

19 ("domestic use of such a method, without more, is not a sufficient basis for a violation of Section 337(a)(1)(B)(i)"). Relying expressly on the statutory language of section 337 and applicable Federal Circuit law, the Commission ruled that the act of importation "is not an act that practices the steps of the asserted method claim," and "[m]erely importing a device that may be used to perform a patented method does not constitute direct infringement of a claim to that method." *Id.* at 17-18 (citing *Cardiac Pacemakers*, 576 F.3d at 1364; *NTP*, 418 F.3d at 1319; *Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1335 (Fed. Cir. 2008) ("[A] party that sells or offers to sell software containing instructions to perform a patented method does not infringe the patent under § 271(a)."); *Joy Techs.*, 6 F.3d at 773 ("The law is unequivocal that the sale of equipment to perform a process is not a sale of the process within the meaning of section 271(a).")).

The Commission stated:

> [S]ection 337(a)(1)(B)(i) covers imported articles that directly or indirectly infringe when it refers to "articles that – infringe." We also interpret the phrase "articles that – infringe" to reference the status of the articles at the time of importation. Thus, infringement, direct or indirect, must be based on the articles as imported to satisfy the requirements of section 337.

Electronic Devices, Comm'n Op. at 13-14. The Commission determined that the importation requirement was not met in that case by the respondent's post-importation performance of a claimed method. *Id.* at 18. Nevertheless, the Commission stated that the complainant "might have proved a violation of section 337 if it had proved indirect infringement" of the method claim. *Id.* The Commission cited, as an example, *Certain Chemiluminescent Compositions, and Components Thereof and Methods of Using, and Products Incorporating the Same*, Inv. No. 337-TA-285, USITC Pub. No. 2370, Order No. 25 (Initial Determination) at 38 n.12 (March

1991), in which "the ALJ found that the 'importation and sale' of the accused articles constituted contributory and induced infringement of the method claim at issue in that investigation." *Electronic Devices*, Comm'n Op. at 18 n.11.

2. Claim 1

The record evidence shows that the accused Funai products satisfy all limitations of asserted independent claim 1 of the '087 patent under the claim constructions adopted above.

a. An MPEG decoder system which includes a single memory for use by transport, decode and system controller functions, comprising:

i. The Funai [ ] Products

Each of the Funai [ ] Products (*i.e.*, the [ ], and [ ]) includes an MPEG decoder system, which includes a single memory for use by transport, decode, and system controller functions, by including either an [ ] or [ ] video decoder chip.[12] For instance, the [ ] Approval Datasheet and [ ] Product Brief each indicate that one of the "[ ]" of the [ ] and [ ] is [ ]" *See* CX-0300C [( ] Datasheet) at 6; CX-0438C ([Brochure) at 1. Additionally, both the [ ] and [ ] feature "[ ]." *See id.* Block diagrams appearing in the [ ] Approval Datasheet and the [ ] Product Brief indicate that in Blu-ray disc ("BD") players the [ ] and [ ] are [ ].

[12] The relevant portions of the source code cited herein and in Dr. Acton's direct witness statement with regard to the Funai [ ] Products may be found at CX-0559C (MediaTek Source Code) at 837MEDIATEK_SC0000094-96, 155, 163, 171-73, 179-87, 190, 192, 194-99, 209-10, 225-27, 231-32, 253-56, 268, 272-74, 278, 284, 295-302, 1934-47, 1955, and 1964-72. *See* Compls. Br. at 71 n.12.

See CX-1594C (Acton WS) at Q&A 169. [ ] is used by transport, decode and system controller functions. *See id.*

ii. The Funai [ ] Products

Each of the Funai [ ] Products (*i.e.*, the [ ], and [ ]) includes an [ ] video decoder and a unified memory for use by transport, decode and system controller functions.[13] A brochure for the [ ] ("[ ] Brochure") indicates that the [ ]. *See* CX-1594C (Acton WS) at 77-78, Q&A 284; CX-0965C ([ ] Product Brief) at 1-2. In a DVD player, the [ ] is connected to [ ], which [ ]. *See* CX-1594C (Acton WS) at Q&A 284; CX-0965C ([ ] Product Brief) at 1.

iii. The Funai [ ] Products

Each of the Funai [ ] Products (*i.e.*, the [ ] and [ ]) includes an MPEG decoder.[14] *See* CX-1594C (Acton WS) at Q&A 318. [ ] *See id.* at Q&A 319. For example, [

[13] The relevant portions of the source code cited herein and in Dr. Acton's direct witness statement with regard to the Funai [ ] Products may be found at CX-0559C (MediaTek Source Code) at 837MEDIATEK_SC00001863-67, 1871, 1874, 1880-83, 1888-93, 1895-98, 1900-22, and 1931-33. *See* Compls. Br at 72 n.13.

[14] The relevant portions of the source code cited herein and in Dr. Acton's direct witness statement with regard to the Funai [ ] Products may be found at CX-0587C (Funai Source Code) at FUNAI-ITC837-SC-00000398-506. *See* Comps. Br. at 72 n.14.

]. *See id.* [

] *See id.*

iv. The Funai [ ] Products

Each of the Funai [ ] Products (*i.e.*, the [ ]) includes a single memory for use by transport, decode and system controller functions.[15] *See* CX-1594C (Acton WS) at Q&A 353. These [ ] televisions incorporate [ ]. *See id.* The service manuals for each of the Funai [ ] Products indicate that in each product [ ]." *See* CX-1594C (Acton WS) at Q&A 354; CX-0606C ([ ] Service Manual); CX-0613C ([ ] Service Manual); and CX-0614C ([ ] Service Manual).

v. Analysis Under Alternate Claim Construction

If Respondents' proposed construction of the claim terms "single memory," "memory," and "first unified memory" were adopted, the evidence shows that the accused Funai products

[15] The relevant portions of the source code cited herein and in Dr. Acton's direct witness statement with regard to the [ ] may be found at CX-0587C (Funai Source Code) at FUNAI-ITC837-SC-00000102-06, 120-25, 132, 141-53, 157, 161-69, 172-74, 176-77, 182-90, 197-201, 168-72, 291, 324, 328-30, 336, 369, 374, 376-77, 381, 384-87, 389-92, and 395-97. *See* Compls. Br. at 73 n.15.

would not satisfy the claim 1 requirement of "a single memory for use by transport, decode and system controller functions." Specifically, [

]. *See* RX-2814C (Schonfeld RWS) at Q&A 20, Q&A 47, Q&A 74, Q&A 101, Q&A 128. Moreover, none of the accused products include [ ]. *See, e.g.*, RX-1650C ([ ] Service Manual); RX-1682C ([ ] Service Manual).

b. a channel receiver for receiving and MPEG encoded stream;

i. The Funai [ ] Products

The evidence shows that each of the Funai [ ] Products includes a channel receiver for receiving an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 170-73. For instance, [

]

171-72.[16]

[

]

WS) at Q&A 173. [

]. *See id.* Second, [

[16] MediaTek's corporate witness testified that [ ]. *See* CX-1594C (Acton WS) at Q&A 172.

]. *See id.*

ii. The Funai [ ] Products

The [ ]. In particular, the [ ], for example, [ ]. *See* CX-1594C (Acton WS) at Q&A 285. [ ]. *See id.* Additionally, [ ]. *See id.*

iii. The Funai [ ] Products

Each of the Funai [ ] Products includes a channel receiver for receiving an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 320. For example, the file [ ]. *See id.* Further, [ ]. *See id.*

iv. The Funai [ ] Products

Each of the Funai [ ] Products includes a channel receiver for receiving an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 355. For instance, [ ]. *See id.* at Q&A 356. [ ]. *See id.*

Dr. Acton also testified that a [

]. *See* CX-1594C (Acton WS) at Q&A 356. [

]. *See id.* [

]. *See id.*

c. transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream;

i. The Funai [ ] Products

Each of the Funai [ ] Products includes transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream. *See* CX-1594C (Acton WS) at Q&A 174. The [

]. *See id.* at Q&A 175. [

]. *See id.* at Q&A 176. [The evidence further shows that

.]

In addition, Dr. Acton testified that [

]. *See id.* at Q&A 177. [

]. *See id.* Indeed, [

]. *See id.* [

]. *See id.*

[

]. *See id.* The [

]. *See id.* at Q&A 178. Then, [

]. *See id.*

Furthermore, [

]

ii. The Funai [ ] Products

The [ ] includes transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream. *See* CX-1594C (Acton WS) at Q&A 286. [

]. *See id.*

iii. The Funai [ ] Products

Each of the Funai [ ] Products includes transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream. *See* CX-1594C (Acton WS) at Q&A 321. [

]. *See id.* The [

]. *See id.* [

]. *See id.*

iv. The Funai [ ] Products

Each of the Funai [ ]Products includes transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream. *See* CX-1594C (Acton WS) at Q&A 357. Specifically, [

]. *See id.* at Q&A 358. [

]. *See id.* [

]. *See id.*

Dr. Acton also testified that another example of transport logic functionality is found in [ ]. *See id.* [

]." *See id.* [

]. *See id.*

v. Respondents' Non-Infringement Arguments Regarding the Term "Coupled"

Respondents raise several non-infringement arguments based upon the satisfaction of the "coupled" claim limitation. *See* Resps. Br. at 443-52. As an initial matter, the parties did not identify "coupled" as a claim term needing construction. Nevertheless, Respondents' construction-based arguments are addressed below.

The first argument Respondents raise is that "[t]he only coupling which Complainants allege is coupling by way of code through the memory." Resps. Br. at 444-46. This argument is not supported by the evidence. For instance, with respect to the Funai [ ] Products, Complainants' expert Dr. Acton testified that [

]. CX-1594C (Acton WS) at Q&A 182-83. In fact, [

Products, [

]. *Id.* at Q&A 183.

Respondents next assert that if "coupling in the accused products occurs by way of code through memory were correct, then three of the four 'coupled to' limitations would be read out of the claims . . . ." Resps. Br. at 446. Specifically, Respondents argue that "the 'transport logic coupled to the channel receiver . . .' limitation would be superfluous to the [limitation] 'wherein the transport logic is operable to access the memory to store and retrieve data during demultiplexing operations." *Id.* Respondents raise similar arguments for the system controller and MPEG decoder limitations. *Id.* "Coupling by way of code," however, would not render any

of the limitations superfluous. For instance, the abbreviated transport logic element identified by Respondents in their brief reads in full: "transport logic coupled to the channel receiver which demultiplexes one or more multimedia data streams from the encoded stream." JX-0001 ('087 patent) at col. 17, lns. 20-23. Reading both transport logic limitations of claim 1 together indicates that the transport logic: (1) demultiplexes one or more data streams from the encoded stream, (2) is coupled to the channel receiver, and (3) accesses the memory to store and retrieve data during demultiplexing operations. If the transport logic were coupled to the channel receiver by way of code through the memory (item (2)), the transport logic still has to demultiplex one or more data streams from the encoded stream (item (1)) and access the memory during demultiplexing operations to store and retrieve data (item (3)). In other words, nothing in these two limitations is rendered superfluous merely because the transport logic and channel receiver may be coupled together by way of code through the memory. The same is true for the MPEG decoder and system controller limitations.

In support of their argument that coupling through memory would render the coupling limitations superfluous, Respondents allege that Dr. Acton testified that the "transport logic is coupled to . . ." and "wherein the transport logic . . ." limitations of claim 1 of the '087 patent are [ ] Products.[17] Resps. Br. at 447-49. Dr. Acton provided testimony regarding the hardware and software elements within the Funai [ ]. CX-1594C (Acton WS) at Q&A 174-78. In discussing the evidence showing that the transport

[17] Respondents do not make any similar arguments with respect to the Funai [ ] Products, the Funai [ ] Products, or the Funai [ ] Products.

logic demultiplexes one or more multimedia data streams from the encoded stream, Dr. Acton provided testimony regarding how the demultiplexing operation is carried out in the Funai [ ] Products. *Id.* at Q&A 176-78. This analysis touched aspects of the demultiplexing process such as when and how the transport logic accesses the memory, which aspects are specifically called out in the "wherein the transport logic . . ." limitation. *Id.*; *see also id.* at Q&A 190-91. In other words, Dr. Acton discussed the "transport logic coupled to . . ." limitation of claim 1 in detail, but those details do not indicate that this limitation is performed identically to the "wherein the transport logic . . ." limitation. The two claim elements require distinct features, and Dr. Acton provided specific testimony regarding the location of each feature in the accused products. *See id.* at Q&A 174-78, Q&A 190-91.

Respondents further argue that Dr. Acton "implies that all modules connected to the main subroutine are coupled." Resps. Br. at 450. In particular, Respondents allege that Dr. Acton testified that "coupling can be transitive – if A is coupled to B, and B is coupled to C, the A is also coupled to C" and cite to the hearing transcript at pages 567 to 568 in support of this assertion. *Id.* Dr. Acton's testimony in this portion of the hearing was as follows:

> Q. All right. Now please correct me if this doesn't sound correct to you, but I believe our – my understanding of your testimony is that two things may be coupled through memory if they are coupled to the same memory and some data flows from one device to the other device through that memory. Is that correct?
>
> A. Right. And I was specifically looking at the, at the cited elements of the system controller, the demultiplexer, and the decoder.
>
> Q. All right. So the mere fact that two things are connected to a memory is not a sufficient basis to say they are coupled, unless some data flows from one to the other, correct?
>
> A. I believe I agree with that, yes.

Acton Tr. 567-568. In other words, Dr. Acton testified that it is not enough that A is coupled to B, and B is coupled to C, for A to be coupled to C. Rather, for A to be coupled to C through B, data that flows from A to B must also flow from B to C. *See id.* Based on Dr. Acton's testimony, if data does not flow from one software sub-module to another, those two sub-modules would not be coupled even though each may be coupled to the main module. Thus, instead of leading to a "nonsensical result" and rendering the "coupled to" limitations "superfluous" as Respondents allege, Dr. Acton provided specific criteria by which the coupling of software modules may be established. *See* Resps. Br. at 450.

Respondents also contend that "coupled" is a term of art that requires a hardwire connection between two components. Resps. Br. at 451. Respondents' argument contradicts the explicit disclosure in the specification of the '087 patent that multiple components of the decoding process may be implemented and coupled entirely through software. The specification teaches that "[t]he computer system 60 also includes software, represented by floppy disks 72, which may perform portions of the video decompression or decoding operation and/or may perform other operations, as desired." JX-0001 ('087 patent) at col. 6, lns. 56-60.[18] Nothing in the prosecution history indicates otherwise. *See* JX-0002 ('087 file history). Therefore, because the meaning of the term "coupled" applied by Dr. Acton is consistent with the intrinsic evidence and the plain and ordinary meaning of the term as understood by a person of ordinary skill in the art, Respondents' non-infringement arguments regarding the "coupling" limitations are not persuasive.

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[18] Inasmuch as the '087 patent explicitly discloses that multiple elements of the video decoder system may be implemented in software, Respondents' arguments that separate and distinct hardware components are required for each element recited in each of the asserted claims are not persuasive. *See* Resps. Br. at 452.

d. a system controller coupled to the transport logic which controls operations within the MPEG decoder system;

i. The Funai [ ] Products

Each of the Funai [ ] Products includes a system controller coupled to the transport logic which controls operations within the MPEG decoder system. The CPU of the [ ]." *See* CX-1594C (Acton WS) at Q&A 180. [ ]

Dr. Acton testified that the source code associated with the [ ] shows that the [ ]. *See id* at Q&A 181. [ ]. *See id.* [ ]. *See id.* To implement the system control functionality, [ ]. *See id.* Additional system control functionality is found [ ]. *See id.* This code allows various "[ ]" operations such as [ ]. *See id.*

ii. The Funai [ ] Products

Dr. Acton testified that the [ ] includes a system controller coupled to the transport logic which controls operations within the MPEG decoder system. *See* CX-1594C (Acton WS) at Q&A 287. Specifically, with respect to system control, [ ]. *See id.* [

.] [

]. *See id.*

iii. The Funai [ ] Products

Each of the Funai [ ] Products includes a system controller coupled to the transport logic which controls operations within the MPEG decoder system. *See* CX-1594C (Acton WS) at Q&A 323. Source code in[

]. *See id.* The system controller [

]. *See id.*

iv. The Funai [ ] Products

Each of the Funai [ ] Products includes a system controller coupled to the transport logic which controls operations within the MPEG decoder system. *See* CX-1594C (Acton WS) at Q&A 359. Specifically, Dr. Acton testified that system controller software is found in [ ]. *See id.* This code is able to [

]. *See id.* [

]; consequently, this file shows that system control is also coupled to the transport logic. *See id.* Here, [

]. *See id.*

In addition, Dr. Acton testified that code in [

]. *See id.* This system control

functionality is [

]. *See id.*

Furthermore, Dr. Acton testified that [

]. *See id.* Here, [ ].

See id. The evidence also showed that the [

]. *See id.* at

Q&A 360. This system control is coupled to the transport logic and provides functionality such

as [ ]. *See id.*

Specifically, [ ]

See id. [

]. *See id.* If, for instance, [

]. *See id.*

e. an MPEG decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the MPEG decoder operates to perform MPEG decoding on the multimedia data streams; and

i. The Funai [ ] Products

Each of the Funai [ ] Products includes an MPEG decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the MPEG decoder operates to perform MPEG decoding on the multimedia data streams. *See* CX-1594C (Acton WS) at Q&A 182. For instance, [

]. *See id.* at Q&A 183. [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

Furthermore, the [ ] indicates that [

]. *See id.* As Dr. Acton testified, [

]. *See id.* at Q&A 184. [

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that the [ ] includes an MPEG decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the MPEG decoder operates to perform MPEG decoding on the multimedia data streams. *See* CX-1594C (Acton WS) at Q&A 288. The [ ] Brochure indicates that [

]. *See id.* In addition, Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

iii. The Funai [ ] Products

Dr. Acton testified that each of the Funai [ ] Products includes an MPEG decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the MPEG decoder operates to perform MPEG decoding on the multimedia data streams. *See* CX-1594C (Acton WS) at Q&A 323. [

]. *See id.* [

]. *See id.* In addition, [ ]. *See id.*

iv. The Funai [ ] Products

Each of the Funai [ ] Products includes an MPEG decoder coupled to receive one or more multimedia data streams output from the transport logic, wherein the MPEG decoder operates to perform MPEG decoding on the multimedia data streams. *See* CX-1594C (Acton WS) at Q&A 361. For instance,[

]. *See id.* at 102-03, Q&A 362. [

]. *See id.*

f. a memory coupled to the MPEG decoder, wherein the memory is used by the MPEG decoder during MPEG decoding operations, wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the MPEG decoder system, wherein the memory is used by the transport logic for demultiplexing operations;

i. The Funai [ ] Products

The evidence shows that the [ ] of each of the Funai [ ] Products is coupled to the MPEG decoder, wherein the memory is used by the MPEG decoder during MPEG decoding operations, wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the MPEG decoder system, and wherein the memory is used by the transport logic for demultiplexing operations. *See* CX-1594C (Acton WS) at Q&A 185. [

].

See id. at Q&A 186. Hence, [ ]. *See id.*

The evidence also shows that [

]. *See id.*

Specifically, [

]. *See id.* [

]. *See id.* The evidence demonstrates, therefore, that [

]. *See id.*

Dr. Acton's testimony shows that [

]. *See id.* at Q&A 187. For instance, [

]. *See id.*

Dr. Acton testified that the memory also stores code and data useable by the system controller which enables the system controller to perform control functions within the video decoder system. *See id.* Specifically, [

]. *See id.* [

]. *See id.* [

]. *See id.*

ii. The Funai [[Products

The evidence shows that the [ ] of each Funai [ ] Product is coupled to the MPEG decoder of the [ ], wherein the memory is used by the MPEG decoder during MPEG decoding operations, wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the MPEG decoder system, and wherein the memory is used by the transport logic for demultiplexing operations. *See* CX-1594C (Acton WS) at Q&A 289. As noted previously, the block diagram for the [ ] appearing in the [ ] indicates that [ ], the [ ] is connected to [ ]. *See id.*

Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* The memory, thus, stores both code and data that the system controller employs in control functions. *See id.*

Dr. Acton further testified that the memory also is used by transport logic for demultiplexing. *See id.* [

]. *See id.* [

]. *See id.*

iii. The Funai [ ] Products

The evidence shows that memory of each of the Funai [ ] Products is coupled to the MPEG decoder, wherein the memory is used by the MPEG decoder during MPEG decoding operations, wherein the memory stores code and data useable by the system controller which enables the system controller to perform control functions within the MPEG decoder system, and wherein the memory is used by the transport logic for demultiplexing operations. *See* CX-1594C (Acton WS) at Q&A 324. With respect to the MPEG decoder, [

]. *See id.* Dr. Acton testified that for system controller functions, [

]. *See id.* For the transport logic, Dr. Acton testified that [

]. *See id.* This code is called by the

]. *See id.*

iv. The Funai [ ] Products

The evidence shows that each of Funai's [ ] Products includes a memory coupled to the MPEG decoder, wherein the memory is used by the MPEG decoder during MPEG decoding operations, wherein the memory stores code and data usable by the system controller which enable the system controller to perform control functions within the MPEG decoder system, and wherein the memory is used by the transport logic for demultiplexing operations. *See* CX-1594C (Acton WS) at Q&A 363. Dr. Acton testified that code in [ ]. *See id.* This code [ ]. *See id.* Code in [ ]. *See id.* [ ]. *See id.* at 103-04, Q&A 364. One such example is the [ ]. *See id.*

Within the transport logic, the evidence shows that [ ]. *See id.* The memory is accessed by the demultiplexer transport logic during demultiplexing. *See id.* Additional transport logic functionality found in [ ]. *See id.* This code gives "[

]. *See id.* Further, Dr. Acton testified that the [

]. *See id.* Specifically, in [

]. *See id.*

The evidence also shows that system control [

]. *See id.* at 104, Q&A 365.

[

]. *See id.*

The [

]. *See id.* [

]. *See id.*

Dr. Acton also testified that certain [ ] are allowed by the MPEG decoding software as shown in [ ]. *See id.* [

]. *See id.* For these system control functions, [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* In addition, the evidence showed [

]. *See id.* This [

]. *See id.*

g. wherein the MPEG decoder is operable to access the memory during MPEG decoding operations;

i. The Funai [ ] Products

The MPEG decoder of each of the Funai [ ] Products is operable to access the memory during decoding operations under the claim construction adopted above. *See* CX-1594C (Acton WS) at Q&A 188. The evidence shows that [

]. *See id.* at 44, Q&A 189. Specifically, [

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that the MPEG decoder of the [ ] is operable to access the memory of the Funai [ ] Product during decoding operations under the claim construction adopted above. *See* CX-1594C (Acton WS) at Q&A 290. For example,

]

iii. The Funai [ ] Products

The evidence shows that the MPEG decoder of the [ ] is operable to access the memory of the Funai [ ] Product during decoding operations under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 290. For example, in the memory,

[

]. *See*

id.

iv. The Funai [ ] Products

The evidence shows that the MPEG decoder of each of the Funai [ ] Products is operable to access the memory during decoding operations under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 366. For example, [

]. *See id.* [

]. *See id.* [

]. *See*

id. [

]. *See id.*

Dr. Acton testified that the [

]. *See id.* In addition, [

]. *See id.* The

[ ]. *See id.*

h. wherein the transport logic is operable to access the memory to store and retrieve data during demultiplexing operations; and

i. The Funai [ ] Products

The evidence shows that the transport logic of each of the Funai [ ] Products is operable to access the memory to store and retrieve data during demultiplexing operations under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 190. Specifically, the [

]. *See id.* at Q&A 191. Dr. Acton testified that [

]. *See id.*

ii. The Funai [ ] Products

The transport logic of the [ ] is operable to access the memory of the Funai [ ] Products to store and retrieve data during demultiplexing operations under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 291. The memory is used by transport logic for demultiplexing. *See id.* For instance, [

]

iii. The Funai [ ] Products

Dr. Acton testified that the transport logic of each of the Funai [ ] Products is operable to access the memory to store and retrieve data during demultiplexing operations under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 326. For example, during demultiplexing, [

]. *See id.*

iv. The Funai [ ] Products

The evidence shows that the transport logic of each of the Funai [ ] Products is operable to access the memory to store and retrieve data during demultiplexing operations under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 367. For instance,

[

]. *See id.* This memory is accessed by the demultiplexer transport logic during demultiplexing. *See id.*

Dr. Acton testified that other transport logic functionality found in

[ ]. *See id.* at Q&A 368. This code gives "[

]" and this demultiplexer is operable to access the memory during demultiplexing by way of a buffer. *See id.* [

]. *See id.*

i. wherein the system controller is operable to access the memory to retrieve code and data during system control functions.

i. The Funai [ ] Products

The evidence shows that the system controller of each of the Funai [ ] Products is operable to access the memory to retrieve code and data during system control functions under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 192. With respect to system control, [

]. *See id.* at Q&A 193.

Further, [

]. *See id.*

Thus, the system controller is operable to access the memory to retrieve code and data during system control functions. *See id.* This conclusion was confirmed by Dr. Acton, who testified that the [

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that the system controller of the [ ] is operable to access the memory of the Funai [ ] Product to retrieve code and data during system control functions under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 292. For example, [

]

iii. The Funai [ ] Products

The evidence shows that the system controller of each of the Funai [ ] Products is operable to access the memory to retrieve code and data during system control functions under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 327. For example, system control functionality in [

]. *See id.*

iv. The Funai [ ] Products

The system controller of each of the Funai [ ] Products is operable to access the memory to retrieve code and data during system control functions under the construction adopted above. *See* CX-1594C (Acton WS) at Q&A 369. [

]." *See id.* [

]. *See id.* [

]. *See id.* Further, [

]. *See id.* at 106, Q&A 107. In this case, [ ]. *See id.* [

]. *See id.*

Dr. Acton testified that certain "[

]. *See id.* Examples of system control functionality that controls operations during decoding [

]. *See id.* For these system control functions, [

]. *See id.* The system controller is [

]. *See id.* [

]. *See id.* [

]. *See id.*

Dr. Acton's testimony also shows that [

]. *See id.* [

]. *See id.*

[

]. *See id.*

3. Claim 5

The record evidence shows that the accused Funai products satisfy all limitations of asserted claim 5 of the '087 patent under the claim constructions adopted above.

a. The MPEG decoder system of claim 1,

As shown above, the accused Funai products satisfy all limitations of asserted claim 1 under the adopted claim constructions.

b. wherein the memory stores anchor frame data during reconstruction of temporally compressed frames.

i. The Funai [ ] Products

In each of the Funai [ ] Products, the MPEG decoder stores anchor frame data during reconstruction of temporally compressed frames. *See* CX-1594C (Acton WS) at Q&A 197. For instance, Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that in the Funai [ ] Products, the [ ] decoder stores anchor frame data during reconstruction of temporally compressed frames. *See* CX-1594C (Acton WS) at Q&A 293. [

]." *See id.* [

]. *See id.* ([

]. *See id.*) [

]

See id.

iii. The Funai [ ] Products

Dr. Acton testified that in each of the Funai [ ] Products, the MPEG decoder system stores, in memory, anchor frame data during reconstruction of temporally compressed frames. *See* CX-1594C (Acton WS) at Q&A 328. This specific functionality is found [ ]. *See id.*

iv. The Funai [ ] Products

In each of Funai's [ ] Products, the memory stores anchor frame data during reconstruction of temporally compressed frames. *See* CX-1594C (Acton WS) at Q&A 371. Specifically, the evidence shows that [

] *See id.* [

]. *See id.*

[

]. *See id.*

Dr. Acton testified that the code in [

]. *See id.* In [

]. *See id.* In addition, each of the Funai [

]. *See id.* at 107, Q&A 372. [

]. *See id.*

4. Claim 7

The record evidence shows that the accused Funai products satisfy all limitations of asserted claim 7 of the '087 patent under the claim constructions adopted above.

a. The MPEG decoder system of claim 1,

As shown above, the accused Funai products satisfy all limitations of asserted claim 1 under the adopted claim constructions.

b. wherein said memory includes a plurality of memory portions, wherein said memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic.

i. The Funai [ ] Products

In each of the [ ] Products, the memory includes a plurality of memory portions, wherein the memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic. *See* CX-1594C (Acton WS) at Q&A 200.

With respect the video frame portion, Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

See id.]

ii. The Funai [ ] Products

Dr. Acton testified that in the Funai [ ] Products, the memory includes a plurality of memory portions, wherein the memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic. *See* CX-1594C (Acton WS) at Q&A 294. With respect to the frame portion, [

]. *See id.*

Regarding the system controller portion, Dr. Acton testified that [

]. *See id.* [

.]

iii. The Funai [ ] Products

The evidence shows that in each of the Funai [ ] Products, the memory includes a plurality of memory portions, wherein the memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic. *See* CX-1594C (Acton WS) at Q&A 329. For instance, Dr. Acton testified that [

]. *See id.* [

]. *See id.* Further, [

]. *See id.* [

]. *See id.*

iv. The Funai [ ] Products

In each of the Funai [ ] Products, the memory includes a plurality of memory portions, wherein the memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic. *See* CX-1594C (Acton WS) at Q&A 373. [ ]. *See id.* at Q&A 374. Dr. Acton testified that with respect to the video frame portion for storing video frames, [

]. *See id.* [

]. *See id.* [

]. *See id.*

Dr. Acton also testified that with respect to the system controller portion for storing code and data, [ ] *See id.* [

]. *See id.* [

]. *See id.* Further, Dr. Acton testified that for the transport buffer portion for storing data used by the transport logic, [

]. *See id.*

v. Respondents' Non-Infringement Arguments

Respondents allege that the accused products do not infringe claim 7 because "Complainants have not identified any portions of the memory that match up with the claimed video frame portion, system controller portion, or transport logic portion of memory." Resps. Br. at 453. The evidence does not support this argument. For instance, with respect to the Funai [ ] Products, Dr. Acton testified, *inter alia*, how [ ]. CX-1594C (Acton WS) at Q&A 200. Similarly, Dr. Acton testified that [ ]. *Id.* Similar identifications were made for the Funai [ ] Products, the Funai [ ] Products, and the Funai Panasonic TV Products. *Id.* at Q&A 294, Q&A 329, Q&A 373-74.

5. Claim 8

The record evidence shows that the accused Funai products satisfy all limitations of asserted claim 8 of the '087 patent under the claim constructions adopted above.

a. The MPEG decoder system of claim 7,

As shown above, the accused Funai products satisfy all limitations of asserted claim 7 under the adopted claim constructions.

b. wherein said memory further includes a video decode buffer portion for storing decoded video data, a video display sync buffer, and an on-screen display buffer.

i. The Funai [ ] Products

In each of the Funai [ ] Products, the memory further includes a video decode buffer portion for storing decoded video data, a video display sync buffer, and an on-screen display buffer. *See* CX-1594C (Acton WS) Q&A 203.

Regarding the video decode buffer, using DVD video as an example, Dr. Acton testified [ ]. *See id.* [ ]. *See id.* Furthermore, [ ] *See id.* Finally, [ ]. *See id.*

ii. The Funai [ ] Products

In the Funai [ ] Products, the memory further includes a video decode buffer portion for storing decoded video data, a video display sync buffer, and an on-screen display buffer. *See* CX-1594C (Acton WS) at Q&A 295. Dr. Acton testified that [ ]. *See id.* [ ]. *See id.* [ ]. *See id.* [

]

iii. The Funai [ ] Products

The evidence shows that in each of the Funai [ ] Products, the memory further includes a video decode buffer portion for storing decoded video data, a video display sync buffer, and an on-screen display buffer. *See* CX-1594C (Acton WS) at Q&A 330. In particular, Dr. Acton testified that the [ ]. *See id.* In [ ]. *See id.* [ ]. *See id.* For example, [ ]. *See id.* In [ ]. *See id.*

iv. The Funai [ ] Products

In each of Funai's [ ] Products, the memory further includes a video decode buffer portion for storing decoded video data, a video display sync buffer, and an on-screen display buffer. *See* CX-1594C (Acton WS) at Q&A 375. With respect to the video decode buffer portion, [ ]. *See id.* [ ]. *See id.* With respect to the video sync buffer, [ ]. *See id.* [ ]. *See id.* There

[

]. *See id.*

Dr. Acton testified that the MPEG decoding functionality in [

]. *See id.* With respect to the on-screen display buffer, in [

]. *See id.* at Q&A 376. [

]. *See id.* [ ].

See id.

v. Respondents' Non-Infringement Arguments

Respondents allege that Complainants "did not identify any memory portions that match up with the claimed video decode buffer portion, video display synch buffer, or on-screen buffer." Resps. Br. at 454. This argument is not supported by the evidence. Dr. Acton provided detailed testimony regarding how the accused products infringe claim 8 of the '087 patent. With regard to the Funai [ ] Products, for example, Dr. Acton testified as follows:

[

].

CX-1594C (Acton WS) at Q&A 203. Thus, far from not identifying "any memory portions" as alleged by Respondents, Dr. Acton identified with specificity where the memory portions recited in claim 8 may be found in the Funai [ ] Products. The same is true for the Funai

[ ] Products, the Funai [ ] Products, and the Funai [ ] Products. *Id.* at Q&A 295, Q&A 330, Q&A 375.

6. Claim 9

The record evidence shows that the accused Funai products satisfy all limitations of asserted claim 9 of the '087 patent under the claim constructions adopted above.

a. The MPEG decoder system of claim 8,

As shown above, the accused Funai products satisfy all limitations of asserted claim 8 under the adopted claim constructions.

b. wherein said memory further includes one or more audio buffers for storing audio data.

i. The Funai [ ] Products

In each of the Funai [ ] Products, the memory further includes one or more audio buffers for storing data. *See* CX-1594C (Acton WS) at Q&A 205.]

]. *See id* at Q&A 206. [

]. *See id.*

[

]. *See id.*

ii. The Funai [ ] Products

In the Funai [ ] Products, the memory further includes one or more audio buffers for storing data. *See* CX-1594C (Acton WS) at Q&A 296. For instance, [

]. *See id.* [

]. *See id.*

iii. The Funai [ ] Products

The evidence shows that in each of the Funai [ ] Products, the memory further includes one or more audio buffers for storing data. *See* CX-1594C (Acton WS) at Q&A 331. [

]). *See id.* [ ]. *See id.* This audio decoding may be applied in conjunction with MPEG decoding. *See id.*

iv. The Funai [ ] Products

In each of Funai's [ ] Products, the memory further includes one or more audio buffers for storing audio data. *See* CX-1594C (Acton WS) at Q&A 377. The evidence shows that accused products are capable of audio decoding in conjunction with the MPEG standard. *See id.* at Q&A 378. For example, [

]. *See id.* [

]. *See id.* [

]. *See id.* [ ]. *See id.* [

]. *See id.* [

]. There is also [ ] *See id.*

v. Respondents' Non-Infringement Arguments

Respondents' allege that Complainants have not identified one or more audio buffers for storing audio data in the accused products, but the evidence shows otherwise. *See* Resps. Br. at 455. With respect to the Funai [ ] Products, Dr. Acton testified:

[

].

CX-1594C (Acton WS) at Q&A 206. Thus, Dr. Acton identified with specificity where in the Funai [ ] Products the audio buffer recited in claim 9 of the '087 patent may be found. The same is true for the Funai [ ] Products, the [ ], and the Funai [ ] Products. *Id.* at Q&A 296, Q&A 331, Q&A 377.

7. Claim 10

The record evidence shows that the accused Funai products satisfy all limitations of asserted independent claim 10 of the '087 patent under the claim constructions adopted above.[19]

a. A method for performing video decoding in an MPEG decoder system which includes a single memory for use by transport, decode and system controller functions, the method comprising:

i. The Funai [ ] Products

The evidence shows that the method of claim 10 is performed by each of the Funai [ ] products. *See* CX-1594C (Acton WS) at Q&A 208. As stated before, each of the Funai [ ] Products includes either a MediaTek [ ] or [ ] video decoder integrated circuit. *See id.* at Q&A 209. Operation of each of the Funai [ ] involves performing video decoding in an MPEG decoder system which [ ]. *See id.*

[19] Complainants have not adduced evidence to show that the accused Funai products practice the methods of claim 10 and 11 upon importation into the United States. *See Electronic Devices* at 13-14 ("[I]nfringement, direct or indirect, must be based on the articles as imported to satisfy the requirements of section 337."). A violation of section 337 with respect to method claims 10 and 11 may nevertheless be found if it is determined that Complainants are liable for indirect infringement of these claims. Indirect infringement will be discussed in a separate section below.

In particular, the [

]" *See* CX-0300C ([ ] Datasheet) at 6; CX-0438C ([

]) at 1. Block diagrams appearing in the [ ] Approval Datasheet and the [ ]

[ ] indicate that [

]. *See* CX-1594C (Acton WS) at Q&A 209. The [is

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that operation of Funai's [ ] Products, each of which utilizes a MediaTek [ ] video decoder integrated circuit, involves performing video decoding in an MPEG decoder system which includes a single memory for use by transport, decode and system controller functions. *See* CX-1594C (Acton WS) at Q&A 298. Each of the Funai [ ] Products includes an [ ] video decoder and a unified memory for use by transport, decode and system controller functions. *See id.* A brochure for the [ ] indicates that the [ ]

[ ]. *See id.*;

CX-0965C ([ ] Product Brief) at 1-2. [

]. *See*

CX-1594C (Acton WS) at Q&A 298; CX-0965C ([ ]) at 1.

iii. The Funai [ ] Products

Operation of each of the Funai [ ] Products, which utilizes a video decoder integrated circuit, involves performing video decoding in an MPEG decoder system that includes

a single memory for use by transport, decode and system controller functions. *See* CX-1594C (Acton WS) at Q&A 333.

iv. The Funai [ ] Products

Operation of Funai's [ ] Products, each of which utilizes a video decoder integrated circuit, involves performing video decoding in an MPEG decoder system that includes a single memory for use by transport, decode and system controller functions. *See* CX-1594C (Acton WS) at Q&A 380.

v. Analysis Under Alternate Claim Construction

If Respondents' proposed construction of the claim terms "single memory," "memory," and "first unified memory" were adopted, the evidence shows that the accused Funai products would not satisfy the claim 10 requirement of "a single memory for use by transport, decode and system controller functions." Specifically, the accused products [

]. *See* RX-2814C (Schonfeld RWS) at Q&A 20, Q&A 47, Q&A 74, Q&A 101, Q&A 128. Moreover, [ ]. *See, e.g.*, RX-1650C ([ ]); RX-1682C ([ ]).

b. receiving an MPEG encoded stream;

i. The Funai [ ] Products

The evidence shows that during operation of each of the Funai [ ] Products, the video decoder system receives an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 210. The block diagrams from the [

] indicate that the [

]. *See id.* at Q&A 211. In addition, [

]. *See id.*

[

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that during operation of the Funai [ ] Products, the [ ] receives an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 299. In particular, the [ ] Brochure indicates that [

]. *See id.* [

]. *See id.* [

]. *See id.*

iii. The Funai [ ] Products

Dr. Acton testified that during operation of each of the Funai [ ] Products, the MPEG decoder receives an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 334. For example, source code in [

]. *See id.* As shown in [

]. *See id.*

iv. The Funai [ ] Products

The evidence shows that during operation of the Funai [ ] Products, the MPEG decoder system receives an MPEG encoded stream. *See* CX-1594C (Acton WS) at Q&A 381. The Funai [ ] Products accept [

]. *See id.* at Q&A 382. [

]. *See id.* Similarly, [

]. *See id.* Other encoded streams supported include [

]. *See id.* The physical receiving channels may be achieved [ ], for example. *See id.*

Dr. Acton testified that another example of code demonstrating the channel receiving capability is found in [ ]. *See id.* Here, [

]. *See id.* Further, in [

]. *See id.*

c. demultiplexing one or more multimedia data streams from the encoded stream, wherein said demultiplexing one or more multimedia data streams from the encoded stream operates using a first unified memory;

i. The Funai [ ] Products

The evidence shows that operation of each of Funai's [ ] Products involves demultiplexing one or more multimedia data streams from the encoded stream, wherein the demultiplexing one or more multimedia data streams from the encoded stream operates using

a first unified memory. *See* CX-1594C (Acton WS) at Q&A 212. For example, features of the [

"]." *See id.* The evidence shows that during operation, the [

]. *See id.* [

]. *See id.*

In the [

]. *See id.* [

]. *See id.* at 52-53, Q&A 213. [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

Further, Dr. Acton testified that the [

]. *See*

id. [

]. *See id.*

[

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* at

Q&A 214.

ii. The Funai [ ] Products

The evidence shows that operation of the Funai [ ] Products involves demultiplexing one or more multimedia data streams from the encoded stream, wherein the demultiplexing one or more multimedia data streams from the encoded stream operates using a first unified memory. *See* CX-1594C (Acton WS) at Q&A 300. Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

iii. The Funai [ ] Products

The evidence shows that operation of each of the Funai [ ] Products involves demultiplexing one or more multimedia data streams from the encoded stream, wherein the demultiplexing one or more multimedia data streams from the encoded stream operates using a first unified memory. *See* CX-1594C (Acton WS) at Q&A 335. Dr. Acton testified that the

[

]. *See id.* [

]. *See id.* [

]. *See id.*

iv. The Funai [ ] Products

The evidence shows that during video decoding in the MPEG decoder system, each of Funai's [ ] Products demultiplexes one or more multimedia data streams from the encoded stream, wherein the demultiplexing one or more multimedia data streams from the encoded stream operates using a first unified memory. *See* CX-1594C (Acton WS) at Q&A 383. Demultiplexing, in the context of MPEG decoding in the Funai [ ] Products, operates using the main memory, which is unified. *See id.* at Q&A 384. Within [

]. *See id.* [

]. *See id.*

Dr. Acton testified that [

]. *See id.* This code gives "[

]. *See id.* Dr. Acton also testified that [

]. *See id.*

d. performing MPEG decoding on the multimedia data streams, wherein said performing MPEG decoding operates using said first unified memory; and

i. The Funai [ ] Products

Operation of each of the [ ] Products involves performing MPEG decoding on the multimedia data streams, wherein the performing MPEG decoding operates using the first unified memory. *See* CX-1594C (Acton WS) at Q&A 215. The evidence showed that [

]. *See id.* at Q&A 216. [

]. *See id.* [

]. *See id.* For instance, [

]. *See id.* [

]. *See id.* In the [

]. *See id.*

The [

]. *See id.* Dr. Acton testified [

]. *See id.* [

]. [

]. *See id.* [

]. *See id.*

[

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that operation of the Funai [ ] Products involves performing MPEG decoding on the multimedia data streams, wherein the performing MPEG decoding operates using the first unified memory. *See* CX-1594C (Acton WS) at Q&A 301. The [

]. *See id.* at Q&A 302. Dr. Acton testified that [

]. *See id.*

Further, Dr. Acton testified [

]. *See id.* [

]. *See id.*

iii. The Funai [ ] Products

The evidence shows that operation of each of the Funai [ ] Products involves performing MPEG decoding on the multimedia data streams, wherein the performing MPEG decoding operates using the first unified memory. *See* CX-1594C (Acton WS) at Q&A 336. [

]. *See id.* Dr. Acton testified that [

]. *See id.* Additionally, [

]. *See id.* Dr. Acton further testified that [

]." *See id.* [

]. *See id.*

iv. The Funai [ ] Products

Dr. Acton testified that during video decoding in the MPEG decoder system, each of Funai's [ ] Products performs MPEG decoding on the multimedia data streams, wherein the performing MPEG decoding operates using the first unified memory. *See* CX-1594C (Acton WS) at Q&A 385. [

]. *See id.* at Q&A 386. [

]. *See id.* [

]. *See id.* The evidence shows that the decoder used in [ ]. *See id.* [

]. *See id.*

e. a system controller controlling operations within the MPEG decoder system, wherein said controlling operations accesses code and data from said first unified memory;

i. The Funai [ ] Products

The evidence shows that during operation of each of the Funai [ ] Products, a system controller controls operations within the MPEG decoder system, wherein the controlling operations accesses code and data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 219. [

]." *See id.* at Q&A 220. [

]. *See id.* The evidence [

] *See id.* Specifically, [

].

See id.

Further, Dr. Acton testified [

]. *See id.* Specifically, [

]. *See id.* [

]. *See id.* [

]. *See id.*

Dr. Acton testified [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* [

].

See id.

ii. The Funai [ ] Products

The evidence shows that during operation of the Funai [ ] Products, a system controller controls operations within the MPEG decoder system, wherein the controlling operations accesses code and data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 303. Specifically, [

]. *See id.* [

]. *See id.* [

]. *See id.*

iii. The Funai {] Products

The evidence shows that during operation of each of the Funai [ ] Products, a system controller controls operations within the MPEG decoder system, wherein the controlling operations accesses code and data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 337. [

]. *See id.* [

]. *See id.*

iv. The Funai [ ] Products

The evidence shows that each of Funai's [ ] Products includes a system controller controlling operations within the MPEG decoder system, wherein the controlling operations accesses code and data from said first unified memory. *See* CX-1594C (Acton WS) at Q&A 387. [

]. *See id.* at Q&A 388. [

]. *See id.* [

]. *See id.*

[

]. *See id.*

As discussed above, [

]. *See id.* In this case, [

]. *See id.* [

]. *See id.*

Dr. Acton testified that [

]. *See id.* [

]. *See id.* For these system control functions, [

]. *See id.* [

]. *See id.* For instance, [

]. *See id.* [

]. *See id.* Dr. Acton also

testified that [ ]

See id. [

]. *See id.* [

]. *See id.*

f. wherein said demultiplexing one or more multimedia data streams, said performing MPEG decoding, and said controlling operations each use said first unified memory.

i. The Funai [ ] Products

The evidence shows that during operation of each of Funai's [ ] Products, the demultiplexing one or more multimedia data streams, the performing MPEG decoding, and the controlling operations each use the first unified memory. *See* CX-1594C (Acton WS) at Q&A 221. [

]. *See id.*

For the decoder, Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.*

ii. The Funai [ ] Products

The evidence shows that during operation of the Funai [ ] Products, the demultiplexing one or more multimedia datastreams, the performing MPEG decoding, and the controlling operations each use the first unified memory. *See* CX-1594C (Acton WS) at Q&A 304. [ ]. *See id.* For instance, [

]. *See id.* [

]. *See id.* [ ] *See id.*

Dr. Acton testified that for MPEG decoding, [ ]. *See id.* Additionally, in MPEG decoding, [ ]. *See id.* [ ]. *See id.* [ ]. *See id.* [ ]. *See id.*

iii. The Funai [ ] Products

The evidence shows that during operation of each of the Funai [ ] Products, the demultiplexing one or more multimedia data streams, the performing MPEG decoding, and the controlling operations each use the first unified memory. *See* CX-1594C (Acton WS) Q&A 338. Regarding the demultiplexing, [ ]. *See id.* [ ]. *See id.*

Dr. Acton testified with respect to the MPEG decoder that a [ ]. *See id.* [ ]. *See id.*

iv. The Funai [ ] Products

The evidence shows that during operation of the Funai [ ] Products, the demultiplexing one or more multimedia data streams, the performing MPEG decoding, and the controlling operations each use the first unified memory. *See* CX-1594C (Acton WS) at Q&A 389. For instance, [

]. *See id.* at Q&A 390. [

]. *See id.*

Dr. Acton testified that [

]. *See id.* [

]. *See id.* Further, Dr. Acton testified that the code [

]. *See id.*

Also, with respect to the MPEG decoder, the evidence shows that [

]. *See id.* at Q&A 391. [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* at Q&A 392. [

]. *See id.*

Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

In addition, [

]. *See id.* at Q&A 393. [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.* [

]. *See id.*

The evidence also shows that [

]. *See id.* [

]. *See id.*

[

]. *See id.*

8. Claim 11

The record evidence shows that the accused Funai products satisfy all limitations of asserted claim 11 of the '087 patent under the claim constructions adopted above.

a. The method of claim 10,

As shown above, the accused Funai products satisfy all limitations of asserted claim 10 under the adopted claim constructions.

b. wherein said demultiplexing one or more multimedia data streams from the encoded stream includes accessing multimedia data stream data from said first unified memory; wherein said performing MPEG decoding on the multimedia data streams includes accessing video frame data from said first unified memory; and wherein said controlling operations includes accessing code and data from said first unified memory.

i. The Funai [ ] Products

During operation of each of the Funai [ ] Products, the demultiplexing one or more multimedia data streams from the encoded stream includes accessing multimedia data stream data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 225. For instance, [

]. *See id.* [

]. *See id.*

Dr. Acton testified that during operation of each of the Funai [ ] Products, [

]. *See id.* at Q&A 226. [

]. *See id.* [

]. *See id.*

During operation of each of the Funai [ ] Products, [

]. *See id.* at Q&A 227.

For instance, Dr. Acton testified that [

]. *See id.* [

]. *See id.* [

]. *See id.*

ii. The Funai [ ] Products

During operation of the Funai [ ] Products, the demultiplexing one or more multimedia data streams from the encoded stream includes accessing multimedia data stream data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 306. For instance, [

]. *See id.* [

]. *See id.* [

]. *See id.*

Dr. Acton testified that during operation of the Funai [Products, the performing MPEG decoding on the multimedia data streams includes accessing video frame data from the first unified memory. *See id.* at Q&A 307. [

]. *See id.* [

]. *See id.*

[

]. *See id.*

Dr. Acton also testified that during operation of the Funai [ ] Products, [

]. *See id.* at Q&A 308. [

].

See id.

iii. The Funai [ ] Products

During operation of each of the Funai [ ] Products, the demultiplexing one or more multimedia data streams from the encoded stream includes accessing multimedia data stream data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 340. Dr. Acton testified, for example, [

]. *See id.* [

]. *See id.*

Dr. Acton also testified that during operation of each of the Funai [ ] Products, performing MPEG decoding on the multimedia data streams includes accessing video frame data from the first unified memory. *See id.* at Q&A 341. For instance, [

]. *See id.*

The evidence also shows that during operation of each of the Funai [ ] Products, the controlling operations include accessing code and data from the first unified

memory. *See id.* at Q&A 342. Specifically, [

]. *See id.*

iv. The Funai [ ] Products

The evidence shows that during video decoding in the MPEG decoder system of each of the Funai [ ] Products, the demultiplexing one or more multimedia data streams from the encoded streams includes accessing multimedia data stream data from the first unified memory. *See* CX-1594C (Acton WS) at Q&A 394. [

]. *See id.* at Q&A 395. [

]. *See id.*

[ ]. *See id.* Multimedia streams (audio and video) are therefore accessed from the buffers in the unified memory. *See id.*

Dr. Acton testified that during video decoding in the MPEG decoder system of each of the Funai [ ] Products, the performing MPEG decoding on the multimedia data streams includes accessing video frame data from the first unified memory. *See id.* at Q&A 396. [

]. *See id.* [

]. *See id.*

Dr. Acton also testified that during video decoding in the MPEG decoder system of each of the Funai [ ] Products, the controlling operations includes accessing code and data from the first unified memory. *See id.* at Q&A 397. [

]. *See id.* [

]. *See id.*

[

]. *See id.*

v. Respondents' Non-Infringement Arguments

Respondents argue that the "accused products do not have multimedia data stream data because it is unclear and ambiguous and Complainants have not asserted what would meet that limitation." Resps. Br. at 456. This argument is not supported by the evidence, because Respondents' expert Dr. Schonfeld was able to understand the meaning of the term in question. *See* RX-2814C (Schonfeld RWS) at Q&A 41 ("the term 'multimedia data stream data' means 'multimedia stream data'"). Furthermore, Respondents do not dispute that Complainants identified specifically where within each of the accused products each and every element of Claim 11 may be found. *See* CX-1594C (Acton WS) at Q&A 224-27, Q&A 305-08, Q&A 339-42, Q&A 394-97.

9. Claim 16

The record evidence shows that the accused Funai products satisfy all limitations of asserted independent claim 16 of the '087 patent under the claim constructions adopted above.

a. The Funai [ ] Products

Claim 16 is directed to a video decoder system, whereas claim 1 is directed to an MPEG decoder system. *See* JX-0001 ('087 patent) at col. 19, ln. 6 – col. 20, ln. 7. An MPEG decoder is a type of video decoder. *See* CX-1594C (Acton WS) at Q&A 229. In all other respects claims 1 and 16 are the same. *See id.* Accordingly, for the same reasons stated before regarding claim 1, these products infringe claim 16. *See id.*

b. The Funai [ ] Products

Claim 16 is directed to a video decoder system, whereas claim 1 is directed to an MPEG decoder system. *See* JX-0001 ('087 patent) at col. 19, ln. 6 – col. 20, ln. 7. An MPEG decoder is a type of video decoder. *See* CX-1594C (Acton WS) at Q&A 309. In all other respects claims 1 and 16 are the same. *See id.* Accordingly, for the same reasons stated before regarding claim 1, these products infringe claim 16. *See id.*

c. The Funai [ ] Products

Claim 16 is directed to a video decoder system, whereas claim 1 is directed to an MPEG decoder system. *See* JX-0001 ('087 patent) at col. 19, ln. 6 – col. 20, ln. 7. An MPEG decoder is a type of video decoder. *See* CX-1594C (Acton WS) at Q&A 343. In all other respects claims 1 and 16 are the same. *See id.* Accordingly, for the same reasons stated before regarding claim 1, these products infringe claim 16. *See id.*

d. The Funai [ ] Products

Claim 16 is directed to a video decoder system, whereas claim 1 is directed to an MPEG decoder system. *See* JX-0001 ('087 patent) at col. 19, ln. 6 – col. 20, ln. 7. An MPEG decoder is a type of video decoder. *See* CX-1594C (Acton WS) at Q&A 398. In all other respects claims 1 and 16 are the same. *See id.* Accordingly, for the same reasons stated before regarding claim 1, these products infringe claim 16. *See id.*

10. Induced Infringement

The evidence shows that Funai actively induces the direct infringement of asserted method claims 10 and 11 of the '087 patent. Funai encourages users to use the MPEG decoder systems incorporated in each of the devices. *See* CX-1594C (Acton WS) at Q&A 403. Based on how the devices are constructed, it is not possible to use the video decoder system in each of

these products without infringing claims 10 and 11 of the '087 patent. *See id.* Funai produces marketing documents and product manuals that describe features of these devices, include detailed instructions on how to use the described devices properly, and provide information on how to contact technical support if additional help or instructions is necessary. *See id.* at Q&A 404. For example, Exhibit CX-0609 ([ ]) states that "[ ]" and that it supports "[ ]" *See* CX-0609 ([ ]) at 2-3. Likewise, Exhibit CX-0124 ([ ]) claims features such as "Blu-ray Disc playback" and "BD-Live (Profile 2.0," and identifies supported compression features such as "MPEG2." *See* CX-0124 ([ ]).

The evidence shows that Funai also creates and distributes product manuals for the Funai Products that provide instructions as to how to set-up and operate their products. *See* CX-1594C (Acton WS) at Q&A 407. These instructions include details on how to play video streams that utilize the infringing video decoding processes. CX-0046 ([ ]) is the User Manual for [ ] product, and CX-0056 ([ ]) is the User Manual for the [ ] product. *See* CX-0046 ([ ]) and CX-0056 ([ ]). These are examples of the documents Funai produces that guide users through the steps needed to operate the video decoder systems, leading to direct infringement of claims 10 and 11. *See* CX-1594C (Acton WS) at Q&A 408. In these manuals, Funai also provides, or arranges for the provision of, technical support to ensure that end users are able to operate all features of the Funai Products, including video playback. *See id.* at Q&A 409. This technical support often is made available through a website, which is accessible in the United States, as

well as through a U.S. Customer Support Line. *See id.* Funai also provides warranty support for the Funai Products in the event a device is unable to perform an intended feature. *See id.* Again, these activities collectively aid end users in directly infringing the asserted claims of the '087 patent. *See id.*

Funai had actual knowledge of the '087 patent no later than March 2012, when Complainants filed the complaint in this investigation and provided infringement claim charts to Funai. *See* CX-1594C (Acton WS) at Q&A 403. Following the institution of this investigation, Funai continued to provide the materials discussed above to its customers. *See id.* at Q&A 410. Inasmuch as Funai knew its actions would aid end users in directly infringing the '087 patent, it is therefore determined that Funai is liable for inducing infringement of asserted method claims 10 and 11 of the '087 patent.

D. Validity

1. General Principles of Law[20]

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Nevertheless, each claim of a patent is presumed to be valid, even if it depends from a claim found to be invalid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986).

A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption of patent validity by "clear and convincing" evidence of invalidity. *Checkpoint Systems, Inc. v. United States Int'l Trade Comm'n*, 54 F.3d 756, 761 (Fed. Cir. 1995).

[20] The legal principles set forth in this section apply equally to the validity analysis of the other patents asserted in this investigation.

In this investigation, Respondents raise the following validity defenses: anticipation, obviousness, indefiniteness, lack of a written description, lack of enablement, and lack of patent-eligible subject matter. *See* GR12 Filing.

a. Anticipation

Anticipation under 35 U.S.C. § 102 is a question of fact. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007). Section 102 provides that, depending on the circumstances, a claimed invention may be anticipated by variety of prior art, including publications, earlier-sold products, and patents.[21] *See* 35 U.S.C. § 102 (*e.g.*, section 102(b) provides that one is not entitled to a patent if the claimed 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").

The general law of anticipation may be summarized, as follows:

> A reference is anticipatory under § 102(b) when it satisfies particular requirements. First, the reference must disclose each and every element of the claimed invention, whether it does so explicitly or inherently. *Eli Lilly & Co. v. Zenith Goldline Pharms., Inc.*, 471 F.3d 1369, 1375 (Fed.Cir.2006). While those elements must be "arranged or combined in the same way as in the claim," *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed.Cir.2008), the reference need not satisfy an *ipsissimis verbis* test, *In re Bond*, 910 F.2d 831, 832-33 (Fed.Cir.1990). Second, the reference must "enable one of ordinary skill in the art to make the invention without undue experimentation." *Impax Labs., Inc. v. Aventis Pharms. Inc.*, 545 F.3d 1312, 1314 (Fed.Cir.2008); *see In re LeGrice*, 49 C.C.P.A. 1124, 301 F.2d 929, 940-44 (1962). As long as the reference discloses all of the claim limitations and enables the "subject matter that falls within the scope of the claims at issue," the reference anticipates -- no "actual creation or reduction to practice" is required. *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1380-81 (Fed.Cir.2003); *see In re Donohue*, 766 F.2d 531, 533 (Fed.Cir.1985). This is so despite the fact that the description provided in the anticipating reference might not otherwise entitle its author to a patent. *See Vas-Cath*

[21] Section 102(g)(1) is discussed separately, below.

> *Inc. v. Mahurkar*, 935 F.2d 1555, 1562 (Fed.Cir.1991) (discussing the "distinction between a written description adequate to support a claim under § 112 and a written description sufficient to anticipate its subject matter under § 102(b)").

In re Gleave, 560 F.3d 1331, 1334 (Fed. Cir. 2009).

b. Obviousness

Under section 103 of the Patent Act, a patent claim is invalid "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."[22] 35 U.S.C. § 103. While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on "underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

The objective evidence, also known as "secondary considerations," includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). "[E]vidence arising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as commercial success, will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR*

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[22] The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

Int'l Co. v. Teleflex Inc., 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

"One of the ways in which a patent's subject matter can be proved obvious is by noting that there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims." *KSR*, 550 U.S. at 419-20. "[A]ny need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.*

Specific teachings, suggestions, or motivations to combine prior art may provide helpful insights into the state of the art at the time of the alleged invention. *Id.* at 420. Nevertheless, "an obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way." *Id.* "Under the correct analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed." *Id.* A "person of ordinary skill is also a person of ordinary creativity." *Id.* at 421.

Nevertheless, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more

than yield a predictable result; combining elements that work together in an unexpected and fruitful manner would not have been obvious).[23]

c. Indefiniteness

The definiteness requirement of 35 U.S.C. § 112 ensures that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2; *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1366 (Fed. Cir. 2004). If a claim's legal scope is not clear enough so that a person of ordinary skill in the art could determine whether or not a particular product infringes, the claim is indefinite, and is, therefore, invalid. *Geneva Pharm., Inc. v. GlaxoSmithKline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003).[24]

Thus, it has been found that:

> When a proposed construction requires that an artisan make a separate infringement determination for every set of circumstances in which the composition may be used, and when such determinations are likely to result in differing outcomes (sometimes infringing and sometimes not), that construction is likely to be indefinite.

Halliburton Energy Servs. v. M-I LLC, 514 F.3d 1244, 1255 (Fed. Cir. 2008).

d. Lack of a Written Description

The issue of whether a patent is invalid for failure to meet the written description requirement of 35 U.S.C. § 112, ¶ 1 is a question of fact. *Bard Peripheral Vascular, Inc. v. W.L. Gore & Assocs., Inc.*, 670 F.3d 1171, 1188 (Fed. Cir. 2012). A patent's written description must clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is

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[23] Further, "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." *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

[24] Indefiniteness is a question of law. *IGT v. Bally Gaming Int'l, Inc.*, 659 F.3d 1109 (Fed. Cir. 2011).

claimed. The test for sufficiency of a written description is "whether the disclosure of the application relied upon reasonable conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date." *Id.* (quoting *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*)).

e. Lack of Enablement

The enablement requirement of 35 U.S.C. § 112, ¶ 1 requires that a patent specification must be enabling such that one skilled in the art would be able to make and use the claimed invention after reading the specification. *See, e.g.*, *In re Vaeck*, 947 F.2d 488, 495 (Fed. Cir. 1991). Whether a specification is enabling is a question of law. *Id.* A specification is enabling when undue experimentation is not required to make and use the invention. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). A determination of whether undue experimentation is required takes into consideration the following factors: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *Id.*

f. Patentable Subject Matter

"A patent is presumed valid and the party asserting invalidity has the burden of persuasion to show the contrary by clear and convincing evidence." *Research Corp. Techs., Inc. v. Microsoft Corp.*, 627 F.3d 859, 870 (Fed. Cir. 2010). Section 101 of the Patent Act sets forth the general categories of subject matter eligible for patent protection:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 101. "Section 101 emphasizes that 'any' subject matter in the four independent categories and 'any' improvement in that subject matter qualify for protection." *Research Corp.*, 627 F.3d at 867. Indeed, the Supreme Court has articulated only three exceptions to these broad categories: laws of nature, physical phenomena, and abstract ideas. *See Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

In order for a patent claim to be held invalid as an "abstract idea," the Federal Circuit requires that "this disqualifying characteristic should exhibit itself so manifestly as to override the broad statutory categories of eligible subject matter and the statutory context that directs primary attention on the patentability criteria of the rest of the Patent Act." *Research Corp.*, 627 F.3d at 868. To that end, "inventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language and framework of the Patent Act." *Id.* at 869; *see also Diamond v. Diehr*, 450 U.S. 175, 187 (1981) ("It is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

Moreover, in determining the eligibility of a claimed "process" under Section 101, "claims must be considered as a whole." *Diehr*, 450 U.S. at 188. As such, "[i]t is inappropriate to dissect the claims into old and new elements and then ignore the presence of the old elements in the analysis." *See id.* "This is particularly true in a process claim because a new combination of steps may be patentable even though all the constituents of the combination were well known and in common use before the combination was made." *Research Corp.*, 627 F.3d at 869 (*quoting Diehr*, 450 U.S. at 188).

In 2008, the Federal Circuit issued its *en banc* decision in *In re Bilski*, in which the majority held that the "machine-or-transformation test" ("MOTT") is the definitive inquiry

governing patentability of a process claim. *In re Bilski*, 545 F.3d 943, at 954-55, 959-60 (Fed. Cir. 2008) ("*Bilski I*"). As articulated by the Supreme Court, the MOTT provides that a process is patent-eligible under Section 101 if:

> (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. A claimed process involving a fundamental principle [such as an equation] that uses a particular machine or apparatus would not preempt uses of the principle that do not also use the specified machine or apparatus in the manner claimed. And a claimed process that transforms a particular article to a specified different state or thing by applying a fundamental principle would not pre-empt the use of the principle to transform any other article, to transform the same article but in a manner not covered by the claim, or to do anything other than transform the specified article.

Id. at 954 (citing *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972)). In so holding, the *Bilski I* Court rejected the applicability of other articulations of Section 101 tests: (1) the *Freeman-Walter-Abele* test, which consisted of determining both whether the claim recites an algorithm, and whether that algorithm is applied to a physical element or process step; and (2) the "useful, concrete and tangible result" test, which focused on preventing patents on mathematical or other principles. *Id.* at 958-60. On appeal, the Supreme Court held that the MOTT is not the exclusive test for determining the patent eligibility of a process. *Bilski v. Kappos,* 130 S. Ct. 3218, 3226-27 (2010) ("*Bilski II*"). The MOTT remains, however, "a useful and important clue, an investigative tool, for determining whether some claimed inventions are processes under § 101." *Id.* at 3227; *accord CLS Bank Int'l v. Alice Corp.*, No. 11-1301 (Fed. Cir. May 10, 2013).

Whether the asserted claims are invalid for failure to claim statutory subject matter is a question of law that may be informed by subsidiary factual issues. *See In re Comiskey*, 554 F.3d 967, 976 (Fed. Cir. 2009) (citations omitted).

2. U.S. Patent No. 5,898,695 ("Fujii")

U.S. Patent No. 5,898,695 ("the '695 patent" or "Fujii") is entitled: "Decoder for Compressed and Multiplexed Video and Audio Data." RX-0069 (Fujii '695). The named inventors are Yukio Fujii and Masuo Oku; the patent assignee is Hitachi, Ltd. of Tokyo, Japan. The Fujii patent application was filed on March 27, 1996. The Fujii patent claims a priority date of March 29, 1995, from Japanese patents No. 7-071131 and 7-071132. *Id.* Both the Fujii priority date of March 29, 1995 and the Fujii filing date of March 27, 1996 are earlier in time than the '087 patent's November 13, 1996 filing date. Thus, Fujii is prior art to the asserted claims of the '087 patent under 35 U.S.C. § 102(e).

a. Anticipation Analysis

Respondents argue that Fujii anticipates all asserted claims of the '087 patent under 35 U.S.C. § 102. Resps. Br. at 461-91. In general terms, Fujii relates to "a receiver/decoder for receiving video and audio data compression encoded by high efficiency coding means and decoding the received encoded data." *See* RX-0069 (Fujii '695) at col. 1, lns. 5-9. The evidence adduced by Respondents, however, fails to show clearly and convincingly that Fujii anticipates the asserted '087 claims.

i. Claim 1

The evidence shows that Fujii does not anticipate claim 1 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 269-74. In particular, the evidence shows that Fujii does not disclose an MPEG decoder system that includes a single memory for use by transport, decode and system controller functions and requires that the transport logic is operable to access the memory to store and retrieve data during demultiplexing operations. *See* CX-1640C (Acton RWS) at Q&A 270. Respondents' expert Dr. Schonfeld argued that Fujii discloses the use of

RAM (including RAM and Program Memory) that is accessed by the Channel Demultiplexer (including the Program Packet Filter and Interface Unit) for demultiplexing of multiple programs such as video and audio data, and that the transport logic "in fact does store and retrieve data during demultiplexing operations." *See* RX-0007C (Schonfeld WS) at Q&A 148. The evidence shows otherwise, however, as Complainants' expert Dr. Acton testified that the demultiplexer of Fujii cannot retrieve data from the memory during demultiplexing operations. *See* CX-1640C (Acton RWS) at Q&A 273. In fact, Dr. Acton testified that the channel demultiplexer receives data only from the error correction demodulator, and that there is nothing in the specification of Fujii to suggest that the channel multiplexer receives data from the RAM. *See id.*; Acton Tr. 2000-2001.

ii. Claim 5

Claim 5 of the '087 patent depends from claim 1, and the evidence shows that Fujii does not anticipate claim 5 of the '087 patent for the same reasons that Fujii does not anticipate claim 1 of the '087 Patent. *See* CX-1640C (Acton RWS) at Q&A 276.

iii. Claim 7

Claim 7 of the '087 patent depends from claim 1, and adds the feature that "said memory includes a plurality of memory portions, wherein said memory includes a video frame portion for storing video frames, a system controller portion for storing code and data executable by the system controller, and a transport buffer portion for storing data used by the transport logic." The evidence shows that Fujii does not anticipate claim 7 of the '087 patent for the same reasons that Fujii does not anticipate claim 1 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 280. In addition, with respect to the specific features recited in claim 7, the evidence shows that Respondents' argument that the RAM of Fujii includes a video frame portion for storing video

ignores the specific disclosure of Fujii. *See id.* at Q&A 281. Dr. Acton testified that FIG. 11, for example, depicts the video decode buffer 9 as a component that is completely separate, apart, and not unified with the RAM. *See id.*

Moreover, the evidence shows that, in every embodiment disclosed in Fujii, the video decode buffer is similarly disconnected from the RAM and, thus, Fujii teaches away from including a video frame portion in the RAM. *See id.* at Q&A 282.

Accordingly, it has not been shown that Fujii discloses the additional limitations of claim 7.

iv. Claim 8

Claim 8 of the '087 patent depends from claims 1 and 7, and the evidence shows that Fujii does not anticipate claim 8 for the same reasons that Fujii does not anticipate claims 1 and 7 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 284-85. In addition, the evidence shows that Fujii teaches away from including the video decode buffer in the RAM and, in every embodiment of Fujii, the video decode buffer is completely separate from the RAM. *See id.* at Q&A 286. Therefore, Respondents' arguments that Fujii discloses the use of RAM (including RAM and Program Memory) that includes the "video decode buffer" for storing decoded video data is not supported by the evidence. *See id.* Therefore, it has not been shown that Fujii discloses the additional limitations of claim 8.

v. Claim 9

Claim 9 of the '087 patent depends from claims 1, 7, and 8, and the evidence shows that Fujii does not anticipate claim 9 for the same reasons that Fujii does not anticipate claims 1, 7, and 8 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 288.

vi. Claim 10

The evidence also shows that claim 10 of the '087 patent is not anticipated by Fujii. *See* CX-1640C (Acton RWS) at Q&A 289-95. Specifically, the evidence shows that Fujii does not disclose at least an MPEG decoder system which includes a single memory for use by transport, decode and system controller functions and requires that the demultiplexing one or more multimedia data streams from the encoded stream operates using a first unified memory. *See id.* at Q&A 290-93. Respondents' expert Dr. Schonfeld argued that Fujii discloses the use of RAM (including RAM and Program Memory) that is used for all read and write operations by the Channel Demultiplexer (including in Program Packet Filter and Interface Unit) for demultiplexing of multiple programs such as video and audio data. *See* RX-0007C (Schonfeld WS) at Q&A 164. The evidence shows, however, that the demultiplexer of Fujii cannot retrieve data from the memory during demultiplexing operations. *See* CX-1640C (Acton RWS) at Q&A 294. In addition, the evidence shows that in FIG. 17 of Fujii, the channel demultiplexer receives data only from the error correction demodulator, and that nothing in FIG. 17 or the specification of Fujii suggests that the channel multiplexer receives data from the RAM. *See id.*; Acton Tr. 2000-2001. Therefore, it has not been shown that Fujii discloses the additional limitations of claim 9.

vii. Claim 11

The evidence shows that Fujii does not anticipate claim 11 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 296-99. In particular, because claim 11 of the '087 patent depends from claim 10, Fujii does not anticipate claim 11 for the same reasons that Fujii does not anticipate claim 10 of the '087 patent. *See id.* at Q&A 297.

Claim 11 also requires that demultiplexing one or more multimedia data streams from the encoded stream includes accessing multimedia data streams from the first unified memory. *See* JX-0001 ('087 patent) at col. 18, lns. 31-34. Respondents' expert Dr. Schonfeld argued that Fujii discloses the use of RAM (including RAM and Program Memory) that is used by the Video Decoder to read and write video frame data. *See* RX-0007C (Schonfeld WS) at Q&A 171. Complainants' expert Dr. Acton testified, however, that the demultiplexer of Fujii cannot access data from the RAM. *See* CX-1640C (Acton RWS) at Q&A 298. Dr. Acton further testified that the channel demultiplexer receives data only from the error correction demodulator and that there is nothing in the specification of Fujii to suggest that the channel multiplexer receives data from the RAM. *See id.*; Acton Tr. 2000-2001. Accordingly, it has not been shown that Fujii satisfies the additional limitations of claim 11.

viii. Claim 16

Independent claim 16 is very similar to independent claim 1, except that claim 16 is directed to a video decoder system instead of an MPEG decoder system. The evidence shows that Fujii does not anticipate claim 16 for the same reasons that Fujii does not anticipate claim 1 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 300.

b. Obviousness Analysis

Respondents allege that Fujii alone renders obvious each and every asserted claim of the '087 patent, but Respondents' position is not supported by the record evidence. *See* Resps. Br. at 495-501.

As set forth above, Fujii does not disclose transport logic that "is operable to access the memory to store and retrieve data during demutliplexing operations" as recited in asserted claims 1 and 16. Respondents argue that such a feature would have been obvious to one of ordinary

skill in the art. Resps. Br. at 496. In support of this position, Respondents cite to the testimony of Dr. Schonfeld, and in particular to Dr. Schonfeld's answers to questions 303 to 314 in Dr. Schonfeld's direct witness statement. *See id.* Dr. Schonfeld addresses the alleged obviousness of claim 1 in his answer to question 303. RX-0007C (Schonfeld WS) at Q&A 303. In Dr. Schonfeld's opinion, claim 1 is obvious because "it would have been obvious to a person of ordinary skill in the art to use the Compressed and Multiplexed Video and Audio Decoder disclosed by Fujii to include a single memory used to store all code and data used by the system controller to perform control functions within the MPEG decoder system."[25] *Id.* Dr. Schonfeld does not discuss the channel demultiplexer or provide any analysis as to why one of ordinary skill in the art would have had any reason to modify the disclosure of Fujii so that the channel demultiplexer could receive data from the memory during demultiplexing operations. Respondents have therefore failed to provide clear and convincing evidence showing that Fujii renders the asserted '087 claims obvious.

3. Fujii in Combination with U.S. Patent No. 5,874,995 ("Naimpally")

U.S. Patent No. 5,874,995 to Naimpally and Inoue (RX-0056) ("Naimpally" or "the '995 patent") is titled, "MPEG Video Decoder Having a High Bandwidth Memory for Use in Decoding Interlaced and Progressive Signals," and has an effective filing date of November 23, 1994. Thus, Naimpally is prior art to the asserted '087 claims.

Respondents assert that it would have been obvious to a person of ordinary skill in the art to combine the structure of memory disclosed in Naimpally with the memory structure disclosed

[25] Dr. Schonfeld's analysis of independent claims 10 and 16 is substantially the same as his analysis of claim 1. *See* RX-0007C (Schonfeld WS) Q&A 308, Q&A 314. Thus, for the same reasons Fujii does not render obvious independent claim 1, it also does not render obvious independent claims 10 and 16.

in Fujii, and that the resulting combination renders obvious claims 7-9 of the '087 patent. Resps. Br. at 505-06. The evidence, however, does not support this position.

As Complainants' expert Dr. Acton testified, even if it were proper to combine Fujii and Naimpally, the resulting combination still would not teach or suggest all of the features recited in independent claim 1, from which claim 7 depends. CX-1640C (Acton RWS) at Q&A 660. For instance, there is no disclosure in Naimpally of transport logic that demultiplexes one or more multimedia data streams from an encoded stream. Thus, even if Respondents were able to combine Fujii and Naimpally as they propose, the resulting combination still would not include the required transport logic that demultiplexes one or more multimedia data streams from an encoded stream. For this reason alone, the combination of Fujii with Naimpally fails to render obvious claims 7-9 of the '087 patent.

a. Claim 7

In addition to not disclosing transport logic that is operable to access memory to store and retrieve data during demultiplexing operations, Naimpally also does not disclose that the memory includes a system controller portion for storing code and data executable by the system controller, as required by claim 7 of the '087 patent. *See* CX-1640C (Acton RWS) at Q&A 661-62. Respondents assert that Figure 2 and col. 5, lines 51-53 of Naimpally provide the necessary disclosure. Resps. Br. at 507. Dr. Acton's testimony shows otherwise: "[t]his portion of Naimpally [] does not disclose that code is stored in a buffer. Figure 2 also does not depict the storage of code executable by the system controller. In fact, nowhere in Naimpally is there such disclosure." CX-1640C (Acton RWS) at Q&A 662. Accordingly, for this additional reason, Respondents have not shown clearly and convincingly that the combination of Fujii and Naimpally renders obvious claim 7 of the '087 patent.

b. Claim 8

Claim 8 depends from claims 1 and 7. Thus, for all the reasons that the combination of Fujii with Naimpally does not render obvious claims 1 and 7, the combination also does not render obvious claim 8. CX-1640C (Acton RWS) at Q&A 665. In addition to those reasons, claim 8 is not rendered obvious because Naimpally does not disclose the video synch buffer recited in claim 8. Respondents do not allege Naimpally discloses a video synch buffer, but instead argue that the buffer is inherent. Resps. Br. at 509. Complainants' expert Dr. Acton testified, however, that a video sync buffer is not "required by Naimpally, much less required to exist in the memory. For example, a buffer could exist separate and apart from the unified memory of the decoder or even be part of the display." CX-1640C (Acton RWS) at Q&A 667. Accordingly, Respondents have failed to show clearly and convincingly that the combination of Fujii and Naimpally renders obvious claim 8 of the '087 patent.

c. Claim 9

Claim 9 of the '087 patent depends from claims 1, 7, and 8. Thus, for all the reasons that the combination of Fujii with Naimpally does not render obvious any of Claims 1, 7, and 8, the combination does not render obvious Claim 9. CX-1640C (Acton RWS) at Q&A 670.

4. Secondary Considerations of Nonobviousness

Complainants argue that secondary considerations demonstrate that the asserted claims of the '087 patent are not obvious. *See* Compls. Br. at 198-99. Specifically, Complainaints argue that evidence of commercial success, long felt but unmet need, failure of others, copying, and praise for the claimed invention weighs against a finding of obviousness. *Id.* The evidence cited by Complainants, however, does not support their argument. In particular, Complainants have not shown the requisite nexus between the alleged secondary considerations and the '087 patent.

Moreover, inasmuch as Respondents have not shown by clear and convincing evidence that the asserted claims are anticipated or rendered obvious in light of the cited prior art references, the secondary considerations play only a minor role in the validity analysis of the '087 patent.

5. Indefiniteness

Respondents argue that claims 7-9 of the '087 patent are indefinite because a person of ordinary skill in the art at the time of the invention would not have understood the distinction between the "video frame" memory portion of claim 7 and the "video decode buffer" of claim 8. Resps. Br. at 514-16. The evidence, however, shows that these claim terms are definite. For instance, Complainants' expert Dr. Acton testified that, contrary to Respondents' arguments, there is no requirement, implied or otherwise, that the video frame portion only holds decoded data. CX-1640C (Acton RWS) at Q&A 767. Dr. Acton also testified that one of ordinary skill in the art would understand that the video frame portion recited in claim 7 could hold the encoded video frame data, while the video decode buffer portion recited in claim 8 could hold decoded frame data. *Id.* In other words, the evidence shows that these claim terms are not insolubly ambiguous and are amenable to construction. *Id.* at Q&A 765.

Respondents' indefiniteness arguments are undercut by their own positions with respect to the alleged obviousness of claims 7-9. In particular, Respondents have argued that each of the elements recited in claims 7-9 of the '087 Patent "is a conventional element of prior art decoder." *See* Resps. Br. at 502. In view of Dr. Acton's testimony that claims 7-9 "are not at all ambiguous and are readily amenable to construction," plus Respondents' assertions that the features of claims 7-9 are "conventional," the record evidence does not show clearly and convincingly that claims 7-9 are insolubly ambiguous or not amenable to construction. *See*

CX-1640C (Acton RWS) at Q&A 767; RIB at 502. It is therefore determined that claims 7-9 of the '087 patent are not invalid for indefiniteness.

VI. The '663 Patent

A. The Asserted Claims and Accused Products

Asserted U.S. Patent No. 6,982,663 ("the '663 patent") is titled, "Method and System for Symbol Binarization." JX-0007 ('663 patent). The '663 patent issued on January 3, 2006, and the named inventor is Lowell Winger. *Id.* The '663 patent relates generally to a "method for the binarization of data in an MPEG data stream." *Id.* at Abstract.

LSI asserts independent claims 1 and 11, and dependent claims 2-9 against Funai. These claims read as follows:

> **1.** A method for generating an index value from a codeword for digital video decoding, comprising the steps of:
>
> (A) setting said index value to a threshold in response to a first portion of said codeword having a first pattern;
>
> (B) adding an offset to said index value based on a second pattern in a second portion of said codeword following said first portion in response to said first portion having said first pattern; and
>
> (C) adding a value to said index value based on a third pattern in a third portion of said codeword following said second portion in response to said first portion having said first pattern.
>
> **2.** The method according to claim 1, further comprising the step of:
>
> generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern.
>
> **3.** The method according to claim 2, wherein said first pattern is a predetermined pattern unique from all possible representations of said fourth pattern.

4. The method according to claim 2, wherein said fourth pattern comprises (i) between zero and a plurality of first bits having a first state and (ii) a second bit having a second state opposite said first state.

5. The method according to claim 4, wherein said second bit follows said first bits.

6. The method according to claim 1, wherein said first pattern comprises a plurality of bits each having a first state.

7. The method according to claim 1, wherein said second pattern comprises between zero and a plurality of first bits having a first state and (ii) a second bit having a second state opposite said first state.

8. The method according to claim 1, wherein said third pattern comprises a binary number.

9. The method according to claim 1, wherein said codeword in compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications Standardization Sector Recommendation H.264.

11. A system comprising:

a decoder configured to generate a codeword; and

a circuit configured to (i) set an index value to a threshold in response to a first portion of said codeword having a first pattern, (ii) add an offset to said index value based on a second pattern in a second portion of said codeword following said first portion in response to said first portion having said first pattern and (iii) add a value to said index value based on a third pattern in a third portion of said codeword following said second portion in response to said first portion having said first pattern.

JX-0007 at col. 7, ln. 31 – col. 8, ln. 2; col. 8, lns. 14-25.

Complainants accused the following Funai products, identified by buyer model number, of infringing one or more asserted claims of the '663 Patent: [

] (collectively, the "Accused Funai H.264 Products"). Compls. Br. at 43 (citing CX-1597C (Reinman WS) at 9, Q&A 38-39).

Exhibit CX-0500C (Reinman Report Ex. D)[26] purports to identify for each Accused Funai H.264 Product, *inter alia*, the internal accused Funai product code, the buyer product code, the supplier of the video decoder, and the part number associated with the video decoder. The information from CX-0500C is summarized in CDX-0800C (Reinman 001) and CDX-0801C (Reinman 002):

[26] The information in CX-0500C (Reinman Report Ex. D) was derived from the following: CX-0555C ([ ] to P&F), which is a spreadsheet from [ ] containing information on products supplied by [ ] to Respondent P&F USA, Inc.; Funai discovery responses; and service manuals produced by Funai marked as CX-0824C (Funai 3rd Response to 2nd Rog Set, Nov. 30, 2012), CX-0141C ([ ]), CX-0556C ([ ]), CX-0557C ([ ]), CX-0560C ([ ]), CX-0558C ([ ]), and CX-0554C ([ ]). CX-1597C (Reinman WS) at Q&A 46.

[

]

B. Claim Construction

1. Level of Ordinary Skill

A person of ordinary skill in the art relating to the '663 patent would be a person with a degree in electrical engineering, computer engineering, computer science, or the equivalent, and would have at least 2-3 years of experience in developing or implementing data processing software or hardware such as video decoders. CX-1644C (Richardson RWS at Q&A 27; CX-1597C (Reinman WS) at Q&A 47-48. This would necessarily include some specific experience with video decoders.[27] CX-1597C (Reinman WS) at Q&A 48.

2. "setting said index value to a threshold" / "set an index value to a threshold"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"setting said index value to a threshold" "set an index value to a threshold"	No construction needed. Alternatively, "setting the index value to an initial number representing the point at which unary to exp-Golomb switching occurs"	"assigning the index value to a predetermined constant"

The claim terms "setting said index value to a threshold" and "set an index value to a threshold" appear in claims 1 and 11 of the '663 patent. Complainants take the position that no construction is necessary, but propose the following alternate construction in the event it is determined that these terms should be construed: "setting the index value to an initial number

[27] Respondents propose that a person of ordinary skill in the art would have three years of work experience in the area of multimedia compression including the binary encoding and decoding of digital signals such as digital image and digital video. Resps. Br. at 269 (citing RX-0007C (Schonfeld WS) at Q&A 13). The parties have not identified any way in which differences in their proposed definitions of the level of ordinary skill in the art affect issues in this investigation. *See id.* at 271.

representing the point at which unary to exp-Golomb switching occurs." *See* Compls. Br. at 200-03. Respondents argue that these claim terms should be construed to mean "assigning the index value to a predetermined constant." Resps. Br. at 339-44.

As proposed by Complainants, the claim terms "setting said index value to a threshold" and "set an index value to a threshold" are construed to mean "setting the index value to an initial number representing the point at which unary to exp-Golomb switching occurs."

Claim 1 of the '663 patent is directed to "generating an index value from a codeword." JX-0007 ('663 patent) at col. 7, lns. 31-32; Schonfeld Tr. 1593, 1596.[28] As a conditional part of this process, element A of claim 1 describes "setting said index value to a threshold." JX-0007 ('663 patent) at col. 7, lns. 33-34. In subsequent elements B and C, the index value is increased by "adding an offset to said index value" and "adding a value to said index value," respectively. *Id.* at col. 7, lns. 35-42. Thus, at the end of this entire process, the index value has been generated from a given codeword. As such, the claim language "setting said index value to a threshold," including the constituent "said index value," speaks for itself concerning what happens to the index value in element A of claim 1.

The claim language of Claim 1 specifies that the "index value" is set to an initial "threshold" in element A, as subsequent claim elements B and C increase this initial "index value" by an "offset" and by an additional "value" in order to finish "generating an index value from a codeword." JX-0007 at col. 7, lns. 31-43; CX-1644C (Richardson RWS) at Q&A 65-66. Further, the specification of the '663 patent designates that the claimed "threshold" represents the point "at which unary to exp-Golomb occurs." JX-0007 at col. 6, lns. 45-47; CX-1644C (Richardson RWS) at Q&A 65-66. Moreover, the constituent term "said index value" refers

[28] This discussion applies equally to claim 11.

back to the preamble of claim 1, which indicates that the claim is directed to "generating an index value from a codeword." JX-0007 ('663 patent) at col. 7, lns. 31-32; Schonfeld Tr. 1593, 1596. Thus, Complainants' proposed construction is consistent with the intrinsic evidence.

In contrast, the '663 specification does not support Respondents' proposed construction. Respondents' proposed construction is wrong to the extent Respondents contend that the claimed "index value" never changes after being set to a "threshold" in element A of claim 1. Claim 1 explicitly discloses that the final "index value" is the end result "generat[ed] from a codeword" after *all* processing of the codeword is completed, including the conditional portions of elements B and C that add both "an offset" and an additional "value" to the initial "threshold" value. *See* CX-1644C (Richardson RWS) at Q&A 90-91. Respondents' argument that the "index value" can never change once set to a "threshold" in element A, or can only change once in either element B or C, would render one or both elements B and C of claim 1 superfluous. *Id.*

Therefore, the claim terms "setting said index value to a threshold" and "set an index value to a threshold" are construed to mean "setting the index value to an initial number representing the point at which unary to exp-Golomb switching occurs."

3. "adding an offset to said index value" / "add an offset to said index value"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"adding an offset to said index value" "add an offset to said index value"	No construction necessary. Alternatively, "increasing the initial index value by a discrete amount"	Indefinite.

The claim terms "adding an offset to said index value" and "add an offset to said index value" appear in claims 1 and 11 of the '663 patent. Complainants take the position that no

construction is necessary, but propose the following alternate construction in the event it is determined that these terms should be construed: "increasing the initial index value by a discrete amount." *See* Compls. Br. at 203-10. Respondents argue that these claim terms are indefinite. Resps. Br. at 344-46.

As proposed by Complainants, it is determined that the claim terms "adding an offset to said index value" and "add an offset to said index value" are not indefinite, and they are construed to mean "increasing the initial index value by a discrete amount."

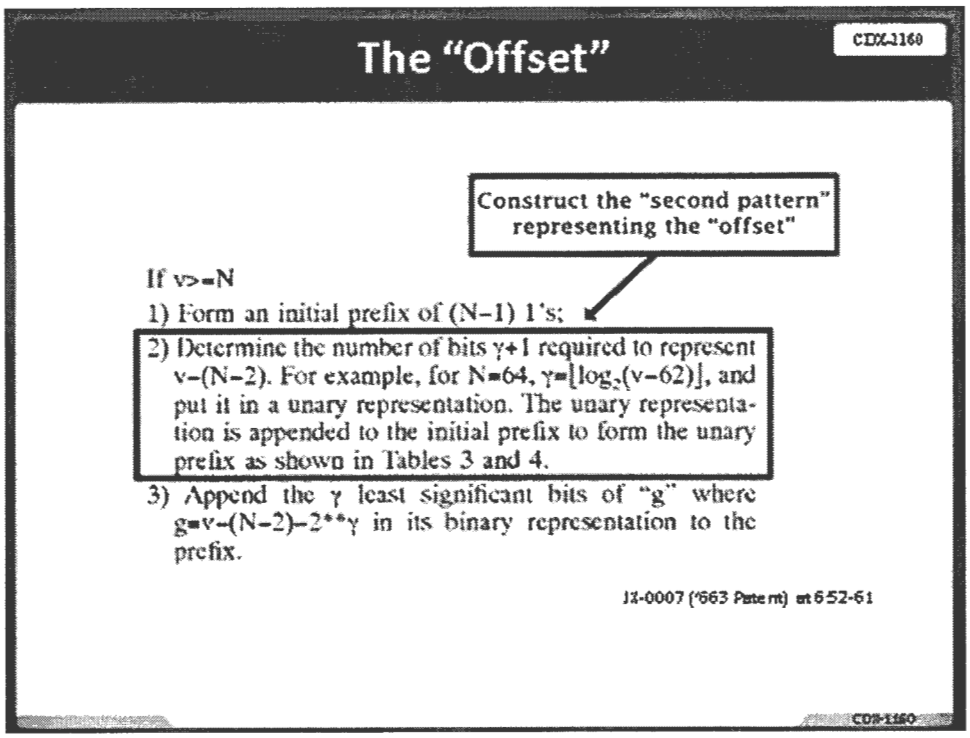
As discussed previously, the entirety of claim 1 is directed to "generating an index value from a codeword." JX-0007 ('663 patent) at col. 7, lns. 31-32; Schonfeld Tr. 1593, 1596.[29] As essential portions of this claimed process, element B of claim 1 describes "adding an offset to said index value" and element C of claim 1 describes "adding a value to said index value." JX-0007 ('663 patent) at col. 7, lns. 35-38. Complainants' proposed construction reflects a succinct restatement of what occurs in element B of claim 1, and thus reflects the plain and ordinary meaning of the term to a person of ordinary skill in the art. *See* CX-1644C (Richardson RWS) at Q&A 70-71.

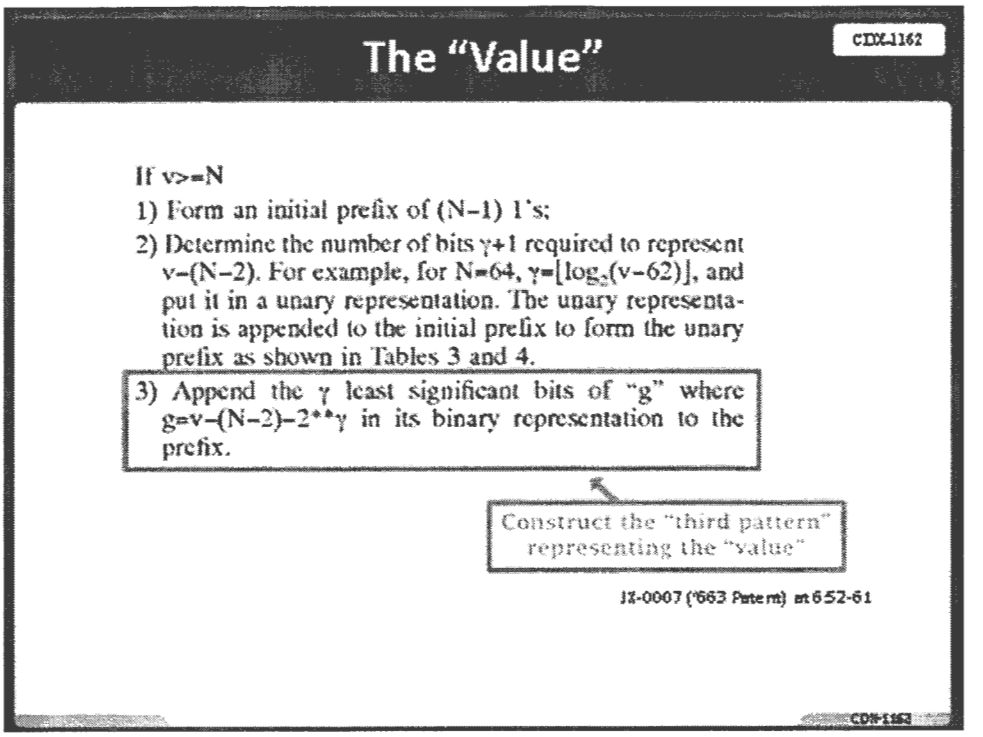
In contrast, Respondents' have not shown clearly and convincingly that the terms "adding/add an offset to said index value" and "adding/add a value to said index value" are indefinite. Respondents' expert Dr. Schonfeld argues that these terms are indefinite because the '663 patent specification purportedly "never even uses" the words "offset" and "value" in this context. *See* RX-0007C (Schonfeld WS) at Q&A 371-72. There is no requirement in patent law that the words used in the claims be exactly the same as the words used in the specification. *See, e.g., All Dental Prodx, LLC v. Advantage Dental Prods., Inc.*, 309 F.3d 774, 778-79 (Fed. Cir.

[29] This discussion applies equally to claim 11.

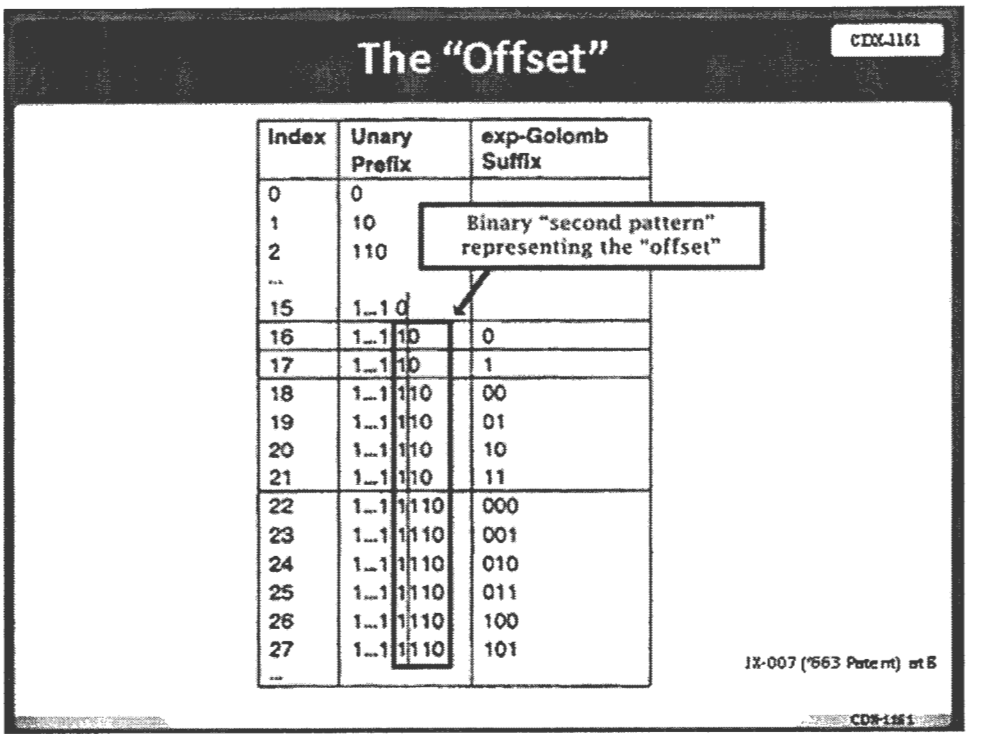
2002). Therefore, the presence or absence of the specific words "offset" and "value" in the written description portion of the specification is not determinative of the question of whether the terms are indefinite.

Moreover, the '663 patent specification includes an embodiment that provides a description of constructing a codeword from three distinct portions of an index value, including a "second pattern" and a "third pattern" described in the claims as representing an "offset" and a "value," respectively. CX-1644C (Richardson RWS) at 26. This is illustrated, for example, in CDX-1160 (Richardson 011) and CDX-1162 (Richardson 013):



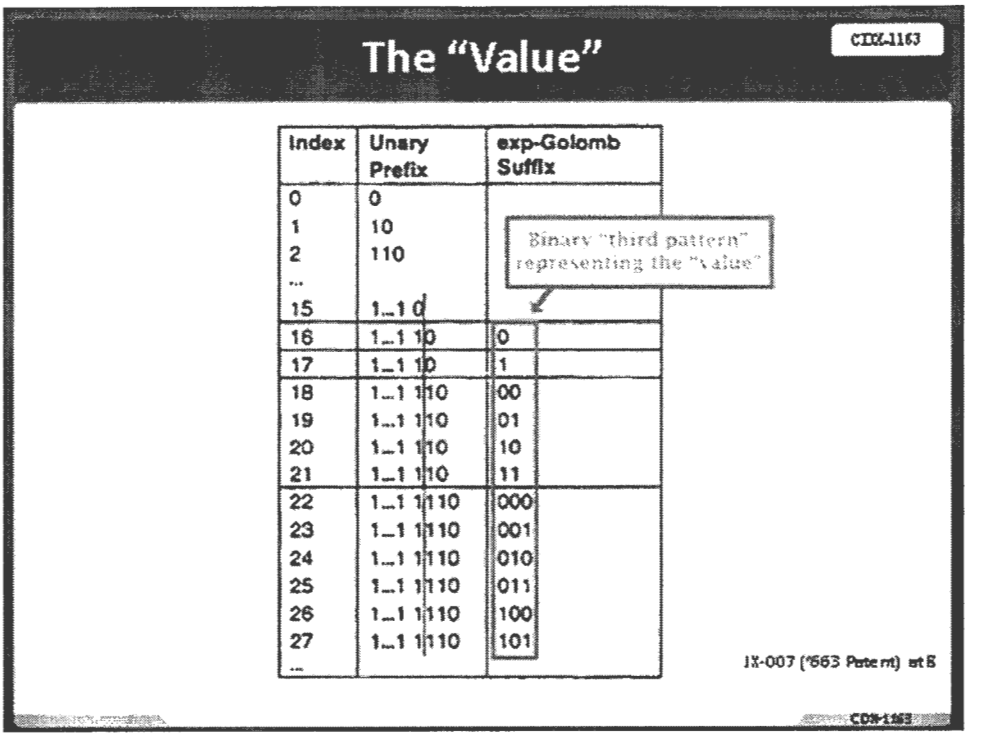


The actual codeword portions generated for the "offset" and "value" portions of a given series of index values pursuant to this embodiment are contained in the tables of Figures 5 and 6 of the '663 patent. Specifically, the second pattern representing the "offset" is represented in Figure 6 of the '663 patent, as illustrated in CDX-1161 (Richardson 012):



Therefore, one of ordinary skill in the art would understand that when the decoder "reverses the steps" of this embodiment to generate the index value from the codeword as described in asserted claims 1 and 11, it is the value of this "offset" that is parsed "based on a second pattern in a second portion of said codeword" and is added to the "index value" previously set to a "threshold" value. CX-1644C (Richardson RWS) at Q&A 74.

Similarly, for that same embodiment, the third pattern representing the claimed "value" is represented in Figure 6 of the '663 Patent, as illustrated in CDX-1163 (Richardson 014):



Therefore, one of ordinary skill in the art also would understand that when the decoder "reverses the steps" of this embodiment to generate the index value from the codeword as described in asserted claims 1 and 11, it is this "value" that is parsed "based on a third pattern in a third portion of said codeword" and is added to the "index value" previously set to a "threshold" value. CX-1644C (Richardson RWS) at Q&A 81-82.

In light of this disclosure in the specification of the '663 patent, the meaning of "adding/add an offset to said index value" and "adding/add a value to said index value" from claims 1 and 11 would be apparent to one of ordinary skill in the art. As such, nothing about these terms, especially when viewed in the context of the specification of the '663 patent, is ambiguous, much less "insolubly ambiguous" as required for a finding of indefiniteness. CX-1644C (Richardson RWS) at Q&A 73; Q&A 79-83.

Therefore, Respondents have failed to adduce clear and convincing evidence that the terms "adding/add an offset to said index value" and "adding/add a value to said index value" from claims 1 and 11 of the '663 patent are indefinite.

4. "adding a value to said index value" / "add a value to said index value"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"adding a value to said index value" / "add a value to said index value"	No construction necessary.	Indefinite.

The terms "adding a value to said index value" and "add a value to said index value" appear in claims 1 and 11 of the '663 patent. Complainants take the position that no construction of these terms is needed. *See* Compls. Br. at 203-10. Respondents argue that these terms are indefinite. *See* Resps. Br. at 346.

For the reasons discussed above with respect to the claim terms "adding/add an offset to said index value" and "adding/add a value to said index value," it is determined that Respondents have not adduced clear and convincing evidence showing that the terms "adding a value to said index value" and "add a value to said index value" are indefinite.

5. "said index value"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"said index value"	No construction necessary. Alternatively, "the value being generated from a codeword"	"the index value assigned to a predetermined constant"

The claim term "said index value" appears in claims 1, 2, 10, and 11 of the '663 patent. Complainants take the position that no construction is necessary, but propose the following

alternate construction in the event it is determined that this term should be construed: "the value being generated from a codeword." *See* Compls. Br. at 200-03. Respondents argue that this claim term should be construed to mean "the index value assigned to a predetermined constant." Resps. Br. at 346-48.

For the reasons discussed above with respect to the claim terms "setting said index value to a threshold" and "set an index value to a threshold," the term "said index value" is construed to mean "the value being generated from a codeword."

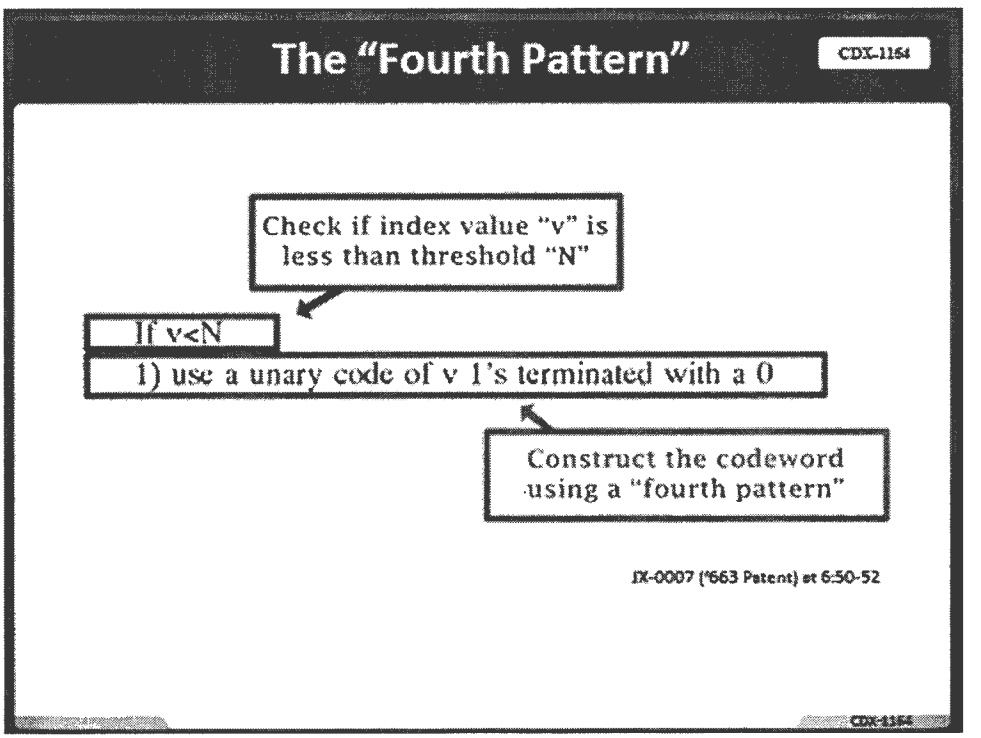
6. "generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern"	No construction needed. Alternatively, "setting the index value based on detection of a fourth pattern representing the binarization of a number different than the number represented by the first pattern"	Indefinite.

The claim term "generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern" appears in claim 2 of the '663 patent. Complainants take the position that no construction is necessary, but propose the following alternate construction in the event it is determined that this term should be construed: "setting the index value based on detection of a fourth pattern representing the binarization of a number different than the number represented by the first pattern." *See* Compls. Br. at 210-14. Respondents argue that these claim terms are indefinite. Resps. Br. at 348-51.

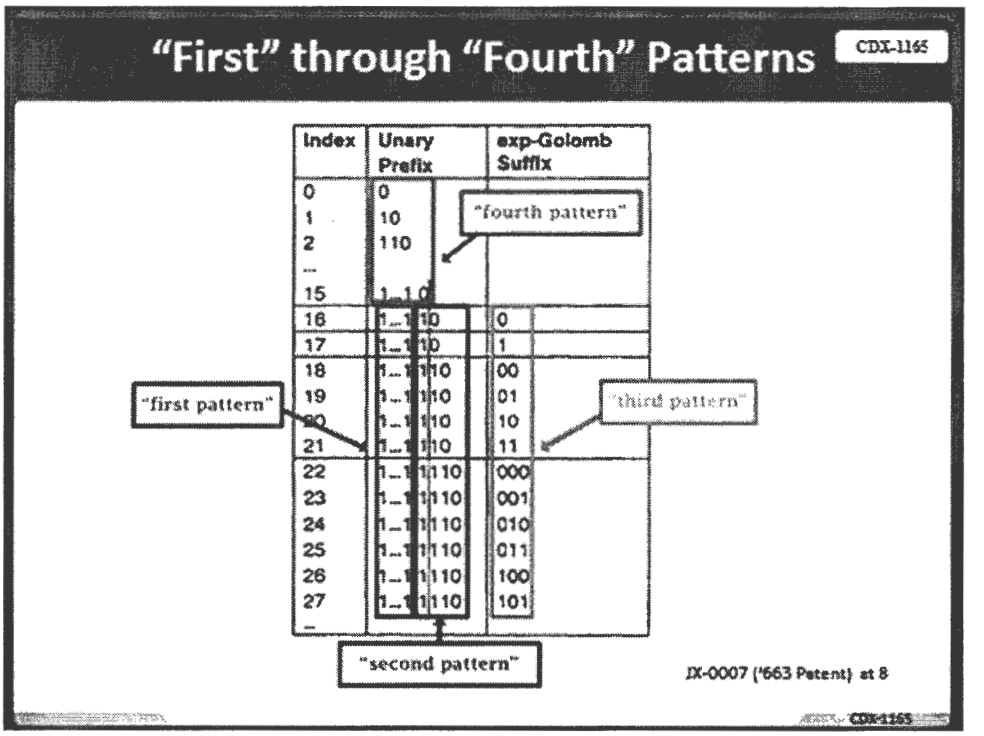
As proposed by Complainants, the claim term "generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern" is construed to mean "setting the index value based on detection of a fourth pattern representing the binarization of a number different than the number represented by the first pattern."

As discussed previously, one embodiment in the '663 specification shows an example of a process that can be used for constructing a codeword from a given index value. As delineated at column 6, lines 50-63, of the '663 patent, the claimed "fourth pattern" is generated in the case of index values with a magnitude below a given threshold. CX-1644C (Richardson RWS) at Q&A 97. This is illustrated below in CDX-1164 (Richardson 015):



Applying the step of this embodiment to the sub-threshold index values from Figure 6 provides an example of the contrast between the "first pattern" and "fourth pattern," and in

particular how that the "fourth pattern" is a pattern "other than said first pattern" (claim 2) and how the "first pattern" is "unique from all possible representations of said fourth pattern" (claim 3). *See* CX-1644C (Richardson RWS) at Q&A 97, Q&A 107-09. This is illustrated below in CDX-1165 (Richardson 016):



As seen in the embodiment depicted above, the first pattern is a "predetermined pattern" related to the value of the threshold. In contrast, the "fourth pattern" varies depending on the associated index value and always ends in a zero. Thus, the "fourth pattern" is a pattern "other than said first pattern" (claim 2) and the "first pattern" is "unique from all possible representations of said fourth pattern" (claim 3). The adopted construction reflects the understanding of a person of ordinary skill in the art with respect to this teaching of the '663 patent. *See* CX-1644C (Richardson RWS) at Q&A 98-99.

Respondents' indefiniteness argument is based on the contention that "the '663 patent specification never even uses the word 'pattern,' much less 'fourth pattern,' nor any indication as to how one would decipher the 'fourth pattern.'" *See* RX-0007C (Schonfeld WS) at Q&A 374-75. As discussed earlier there is no legal requirement that the words used in the claims be exactly the same as the words used in the remainder of the specification. *See, e.g., All Dental Prodx*, 309 F.3d at 778-79. As such, the presence or absence of the specific words "fourth pattern" in the specification has no relevance in and of itself to whether or not the term "generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern" is indefinite.

It is determined that Respondents have not adduced clear and convincing evidence showing that this claim term is indefinite.

7. "wherein said codeword is compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications Standardization Sector Recommendation h./264"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"wherein said codeword is compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications Standardization Sector Recommendation h./264"	No construction needed.	Indefinite.

The claim term "wherein said codeword is compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications

Standardization Sector Recommendation h./264" appears in claim 9 of the '663 patent. Complainants take the position that no construction is needed for this term, and that its plain meaning should apply. Compls. Br. at 217-18. Respondents argue that this term is indefinite. Resps. Br. at 351-52.

The H.264 standard, which is the standard referred to in claim 9, provides details about the various codewords that are "compatible" with the standard and how such codewords are used and constructed. CX-1597C (Reinman WS) at Q&A 155. For example, the H.264 standard provides detail regarding codewords created using UEGk binarization that would be "compatible" with the H.264 standard. *Id.*; CX-1644C (Richardson RWS) at Q&A 131; CX-0642 (H.264 Standard, Jan. 2012) at 267-69, 270-71, 274-75; CX-1597C (Reinman WS) at Q&A 165-72. One of ordinary skill in the art would understand such codewords to be "compatible" with the H.264 standard as required in claim 9 without further construction or explanation.

It is therefore determined that Respondents have not adduced clear and convincing evidence to show that the claim term "wherein said codeword is compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications Standardization Sector Recommendation h./264" is indefinite.

C. Infringement

1. Complainants' Reliance on the H.264 Reference Software to Show Infringement

The H.264 Standard[30] is an industry standard for video encoding and decoding. The H.264 Standard utilizes UEGk[31] encoding for specific index values essential to commercial H.264 Standard compliance. Complainants argue:

> [T]he asserted claims of the '663 Patent represent the only commercially-viable methodology for decoding the UEGk encoded index values described in the H.264 Standard. As a result, any commercial product that performs decoding of H.264-compliant video streams utilizing UEGk encoded index values necessarily practices the asserted claims of the '663 Patent.

Compls. Br. at 218-19.

In support of this argument, Complainants adduced evidence showing that the H.264 Standard describes specific UEGk index values for compliant video streams. *See* Compls. Br. at 219-20. In particular, the evidence shows that the H.264 Standard describes the process for constructing various types of binary codewords from index values, also called "syntax elements," utilizing UEGk encoding. CX-0642 (H.264 Standard, Jan. 2012) at 270-71, § 9.3.2.3. UEGk encoded index values consist of the concatenation of a fixed unary first part followed by a two-part exp-Golomb portion. CX-1597C (Reinman WS) at Q&A 168. For values below a given threshold, only unary binarization is used for the entire codeword. *Id.*

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[30] For purposes of this Initial Determination, "H.264 Standard" refers to Recommendation ITU-T H.264, International Standard ISO/IEC 14496-10 (01/2012) marked as CX-0642 (H.264 Standard, Jan. 2012). The H.264 Standard has undergone a number of revisions over the years; however, the operative sections of the H.264 Standard are materially identical in earlier revisions of the H.264 Standard. Some of the earlier versions of the H.264 Standard can be found in exhibits CX-0549 (H.264 Standard, Mar. 2010), CX-0646 (H.264 Standard, Nov. 2007), CX-0647 (H.264 Standard, Mar. 2009), and CX-0137 (H.264 Standard, Jun. 2011).

[31] "UEGk" is an acronym for "unary/exp-Golomb."

The H.264 Standard states that "input to this [UEGk encoding] process is a request for UEGk binarization for a syntax element . . . Output of this process is the UEGk binarization of the syntax element." CX-0642 (H.264 Standard, Jan. 2012) at 270-71, § 9.3.2.3. With respect to the reverse process, the H.264 Standard describes the decoding of UEGk index values, again also called "syntax elements." Accordingly, "input to this process is a binarization of the requested syntax element . . . Output of this process is the value of the syntax element." CX-0642 (H.264 Standard, Jan. 2012) at 274-75, § 9.3.3. In particular, the UEGk decoding process of Section 9.3.3 "specifies how each bit of a bit string is parsed for each syntax element." *Id.*

UEGk encoding is used for three specific index values described in the H.264 Standard: (1) "mvd_l0;" (2) "mvd_l1;" and (3) "coeff_abs_level_minus1." CX-0642 (H.264 Standard, Jan. 2012) at 267-69, Table 9-34; CX-1597C (Reinman WS) at Q&A 170-71. The index values "mvd_l0" and "mvd_l1" each specify the difference between a particular motion vector component to be used and its prediction. CX-0642 (H.264 Standard, Jan. 2012) at § 7.4.5.1; CX-1597C (Reinman WS) at Q&A 172. The index value "coeff_abs_level_minus1" represents the absolute value of a transform coefficient level minus 1. CX-0642 (H.264 Standard, Jan. 2012) at § 7.4.5.3.3; CX-1597C (Reinman WS) at Q&A 172. As such, each of the three UEGk encoded index values described in the H.264 Standard plays an important role in compressing and decompressing frame data associated with digital video. CX-1597C (Reinman WS) at Q&A 172-73.

The record evidence shows that the H.264 Standard itself provides guidance with respect to the actual implementation of a decoder that performs decoding of the UEGk index values described in the H.264 Standard. Specifically, reference software called "H.264.2" is provided in conjunction with the H.264 Standard. *See* CX-0644 (H.264.2 Reference Manual & Software,

Jan. 2012). This reference software sets forth, among other things, the presumptive method for decoding the UEGk index values described in the H.264 Standard. CX-1597C (Reinman WS) at Q&A 174. The particular source code section of the H.264.2 Reference Software that performs decoding of the UEGk index values from the H.264 Standard is entitled "cabac.c". *See* CX-0499C (Reinman Report Ex C-1).[32]

In their post-hearing brief, Complainants offer evidence showing that the methodology used for decoding UEGk index values in the H.264.2 Reference Software practices each of the limitations of claims 1-9 of the '663 patent, and that a product or system that implements the methodology disclosed in the H.264.2 Reference Software for decoding UEGk index values would satisfy all of the limitations of claim 11 of the '663 patent. *See* Compls. Br. at 221-41. Although Complainants do not argue that the accused Funai products infringe the asserted '663 claims by virtue of their incorporation of the H.264.2 Reference Software, they do allege the following:

> The methods and system described in the asserted claims of the '663 Patent represent the only commercially viable methodology for decoding the UEGk index values described in the H.264 Standard. CX-1597C (Reinman Direct Witness Statement) at 77, Q&A 221. Therefore, it is far more likely than not—indeed, almost certain—that the operation of each of the Accused Funai Products infringes Claims 1-9 of the '663 Patent, and the Accused Funai Products themselves each infringe Claim 11 of the '663 Patent. *Id.*

Compls. Br. at 241-42.

Complainants argue that "[t]he lack of a realistic commercial alternative to the asserted claims of the '663 Patent for decoding of H.264-compliant UEGk index values is demonstrated

[32] CX-0499C is a copy of the cabac.c file from the H.264.2 Reference Software. Line numbers have been added to the left-hand side of CX-0499C (Reinman Report Ex C-1) for reference. Additional copies of all or part of this same code are marked as CX-0550 (cabac.c), CX-0551 (cabac.c), CX-0552 (cabac.c), CX-0553 (cabac.c), and CX-0139 (cabac.c).

in a number of ways, including by (i) the adoption of the methodology of the asserted claims in the H.264.2 Reference Software; (ii) a comprehensive review of theoretical alternatives to the asserted claims of the '663 Patent; and (iii) [ ]." Compls. Br. at 242. Based on these arguments, Complainants conclude that, inasmuch as "the methods and system described in the asserted claims of the '663 Patent represent the only commercially viable methodology for decoding the UEGk index values described in the H.264 Standard," it is therefore "far more likely than not that any commercial product employing an H.264 decoder practices Claims 1-9 of the '663 Patent, and each such product itself would satisfy all limitations of Claim 11 of the '663 Patent." *Id.* at 248.

Complainants' analysis of the H.264.2 Reference Software, however, is not dispositive of the question of whether Funai's products infringe the asserted '663 claims. The record evidence shows that the ITU provides the software as an aid to assist in the implementation of decoding syntax elements encoded using UEGk binarization. CX-1644C (Richardson RWS) at Q&A 514. As such, use of the H.264.2 Reference Software is optional, and there is no evidence that [ ]. Complainants have therefore failed to meet their burden to prove infringement by a preponderance of the evidence based on the H.264.2 Reference Software.

2. The Accused Funai Products

With respect to the accused Funai products, Complainants allege the following:

> [T]he asserted claims of the '663 Patent represent the only commercially viable methodology for decoding H.264-compliant UEGk index values. Each of Accused Funai H.264 Products [ ]. As such, Funai directly infringes Claim 11 of the '663 Patent, either literally or

> under the doctrine of equivalents, by selling and/or importing the Accused Funai H.264 Products into the United States. In addition, Funai indirectly infringes Claims 1-9 of the '663 Patent by actively inducing others to directly infringe by operating the accused Funai products [ ]. Furthermore, Funai contributorily infringes Claims 1-9 of the '663 Patent.

Compls. Br. at 249.

Further, Complainants argue that "it is far more likely than not" that a company manufacturing decoders that decode bitstreams compliant with the H.264 Standard would use the methodologies described in the H.264.2 Reference Software. Compls. Br. at 243-44. These allegations, however, are not enough to prove infringement by a preponderance of the evidence. The fact that a set of products uses methodology similar to a published reference does not show that those products actually infringe the asserted claims of the '663 patent.

Complainants do provide an infringement analysis of MediaTek decoder source code incorporated into certain Funai products, but do not provide any analysis for Funai products that do not use MediaTek decoders. *See* Compls. Br. 255-77. Accordingly, it is determined that Complainants have not shown that Funai products using non-MediaTek satisfy the elements of the asserted '663 claims.

As for the Funai products that use MediaTek decoders, the following section provides a claim-by-claim infringement analysis.

3. Accused Products Containing MediaTek Decoders

Complainants argue that "the source code for the MediaTek commercial decoders used in a number of the Accused Funai H.264 Products predictably confirms that each such decoder

practices the asserted claims of the '663 Patent."[33] Compls. Br. at 255 (citing CX-1597C (Reinman WS) at Q&A 256. There are [ ] MediaTek decoders used in the accused Funai H.264 products: [

]. *See* JX-0019C ([ ] Dep.) at 60-61; CX-1597C (Reinman WS) at Q&A 259.

a. Claim 1

The record evidence shows that the MediaTek decoders do not satisfy all elements of claim 1.[35]

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[33] The pertinent source code for the MediaTek decoders can be found in CX-0559C (MediaTek Source Code).

[34] The relevant source code for the [ ] is found at CX-0559C (MediaTek Source Code) at 837MEDIATEK_SC0000384-456; 837MEDIATEK_SC0001753-1785; 837MEDIATEK_SC0000611-674; and 837MEDIATEK_SC0001712-1731, respectively.

[35] Complainants have not adduced evidence to show that the accused Funai products practice the methods of claims 1-9 upon importation into the United States. *See Electronic Devices* at 13-14 ("[I]nfringement, direct or indirect, must be based on the articles as imported to satisfy the requirements of section 337."). A violation of section 337 with respect to method claims 1-9 may nevertheless be found if it is determined that Complainants are liable for indirect infringement of these claims. Indirect infringement will be discussed in a separate section below.

i. A method for generating an index value from a codeword for digital video decoding, comprising the steps of:

As indicated by the relevant source code, the [ ] decoders each performs [ ] and thereby generates the corresponding index values. CX-1597C (Reinman WS) at Q&A 262. In particular, [ ]. *See id.*

ii. (A) setting said index value to a threshold in response to a first portion of said codeword having a first pattern;

Complainants allege that the MediaTek decoders practice this first step of claim 1.[36] *See* Compls. Br. at 257-78. The evidence shows, however, [ ]. CX-1597C (Reinman WS) at Q&A 263. [ ]. *Id.*; CX-0559C (MediaTek Source Code) at 837MEDIATEK_SC0000394, lines 26967-68 ([ ]); 837MEDIATEK_SC0000618, lines 5761-62 ([ ]).[37]

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[36] A similar limitation appears in claim 11. The analysis set forth in this section applies equally to claim 11.

[37] [CX-1597C CX-0559C CX-1597C [ ]

Complainants argue that [ ] is within the scope of the '663 claims, but this argument is not supported by the evidence. *See* Compls. Br. at 283-84. First, [ ]" contradicts Dr. Reinman's testimony confirming that receiving the first pattern is a "predicate" or prerequisite to performing steps (A), (B), and (C) of claim 1. Reinman Tr. 631. Second, there is no intrinsic support for this argument; neither the '663 patent specification nor the '663 patent prosecution history mentions [ ]. Third, this argument contradicts the express language of claim 1, which recites performing step (A) "in response to a first portion of said codeword having a first pattern."

Therefore, it is determined that the MediaTek decoders do not satisfy this claim limitation.

iii. (B) adding an offset to said index value based on a second pattern in a second portion of said codeword following said first portion in response to said first portion having said first pattern; and

[

CX-1597C

CX-0559C

CX-1597C .]

[

]).

[

]." *Id.* [

]. *Id.* [

]." *Id.*;

CX-0559C

]).

[

]).

[

]. CX-0559C

]).

[

].

[

CDX-0828C

]).

Inasmuch as step (B) of claim 1 requires "adding an offset to said index value," and the evidence summarized above shows that [

], it is determined that Complainants have not shown literal infringement of step (B) of claim 1. RX-2814C (Schonfeld WS) at Q&A 177.

iv. (C) adding a value to said index value based on a third pattern in a third portion of said codeword following said second portion in response to said first portion having said first pattern.

[

]. *See* CX-1597C

CX-0559C

CX-0559C

]. *Id.*

[

].

[

]. *See id.*; CX-0559C (

See CX-

CX-0559C

]).

[

CX-0559C

CX-0559C

See CX-1597C

CDX-0830C

]).

Inasmuch as step (C) of claim 1 requires "adding a value to said index value," and the evidence summarized above shows that [

], it is determined that Complainants have not shown literal infringement of step (C) of claim 1. RX-2814C (Schonfeld WS) at Q&A 177.

v. Doctrine of Equivalents

Complainants also argue that the MediaTek decoders satisfy steps (B) and (C) of claim 1 under the doctrine of equivalents. *See* Compls. Br. at 285-87. In alleging infringement under the doctrine of equivalents, Complainants rely on the associative property of addition and "basic mathematics." *Id.* In essence, Complainants argue that "based on the associative property of addition, there is no material difference" between the two equations:

"Threshold" + ("Offset" + "Value")

("Threshold" + "Offset") + "Value"

Id. at 287.

Complainants' doctrine of equivalents analysis considers claim 1 as a whole and does not consider each limitation separately. *See Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 29 (1997) ("Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole."); *accord Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1356 (Fed. Cir. 2012) ("the doctrine of equivalents must be applied to the claims 'on an element-by-element basis,' so that every claimed element of the invention—or its equivalent—is present in the accused product").

For instance, Complainants consider the second and third limitations of claim 1 *together* when asserting that the differences between claim 1 and the accused products are allegedly insubstantial. *See* Compls. Br. at 287. Complainants state: "[the two equations] produce the exact same final result, *i.e.*, the 'offset' has been added to the 'index value' and the 'value' has

been added to the 'index value,' respectively." *Id.* at 287. When referring to the "final result," Complainants are referring to the combined result of steps (B) and (C) of claim 1, while ignoring the individual result of each step. This combined limitation differs from the actual limitations set forth in the claim, and it is improper to compare such a combined limitation for purposes of the doctrine of equivalents. *Warner-Jenkinson Co.*, 520 U.S. at 29.

Therefore, it is determined that the MediaTek decoders do not satisfy steps (B) and (C) of claim 1 under the doctrine of equivalents.

b. Claim 2

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 2.

i. The method according to claim 1, further comprising the step of:

As shown above, the MediaTek decoders do not satisfy all limitations of claim 1.

ii. generating said index value based on a fourth pattern in said first portion in response to said fourth pattern being other than said first pattern.

[

]"

[

]. *See* CX-1597C

CX-

].

[

]. CX-1597C

]. *Id.* [

]. *See id.*

c. Claim 3

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 3.

i. The method according to claim 2,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 2.

ii. wherein said first pattern is a predetermined pattern unique from all possible representations of said fourth pattern.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 3, "wherein said first pattern is a predetermined pattern unique from all possible representations of said fourth pattern."

[

CX-1597C CX-0559C

CX-1597C

CX-0559C

]. CX-1597C

CX-0559C

See CX-1597C

]. *See id.*

d. Claim 4

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 4.

i. The method according to claim 2,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 2.

ii. wherein said fourth pattern comprises (i) between zero and a plurality of first bits having a first state and (ii) a second bit having a second state opposite said first state.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 4, "wherein said fourth pattern comprises (i) between zero and a plurality of first bits having a first state and (ii) a second bit having a second state opposite said first state."

[

CX-1597C

].

[

]. *Id.*

e. Claim 5

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 5.

i. The method according to claim 4,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 4.

ii. wherein said second bit follows said first bits.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 5, "wherein said second bit follows said first bits."

[

].

See CX-1597C (Reinman WS) at Q&A 271. [

]. *See id.* at Q&A 272.

f. Claim 6

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 6.

i. The method according to claim 1,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 1.

ii. wherein said first pattern comprises a plurality of bits each having a first state.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 6, "wherein said first pattern comprises a plurality of bits each having a first state."

[

]. *See* CX-1597C (Reinman WS) at Q&A 270. [

]. *See id.* at Q&A 273.

g. Claim 7

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 7.

i. The method according to claim 1,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 1.

ii. wherein said second pattern comprises between zero and a plurality of first bits having a first state and (ii) a second bit having a second state opposite said first state.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 7, "wherein said second pattern comprises between zero and a plurality of first bits having a first state and (ii) a second bit having a second state opposite said first state."

[CX-0559C

CX-0559C

]" *See* CX-1597C

]. *See id.*

[

]. *See id.*

h. Claim 8

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 8.

i. The method according to claim 1,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 1.

ii. wherein said third pattern comprises a binary number.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 8, "wherein said third pattern comprises a binary number."

[

]. *See* CX-1597C [

]. *Id.*

[

]. *Id.*

i. Claim 9

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 9.

i. The method according to claim 1,

As shown above, the MediaTek decoders do not satisfy all limitations of claim 1.

ii. wherein said codeword in compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications Standardization Sector Recommendation H.264.

The evidence shows that the MediaTek decoders satisfy the additional limitation of claim 9, "wherein said codeword in compatible with at least one of an International Organization for Standardization/International Electrotechnical Commission 14496-10 standard and an International Telecommunication Union-Telecommunications Standardization Sector Recommendation H.264."

[

]." CX-1597C

See CX-0642

CX-

; CX-1597C].

[

].

CX-1597C (Reinman WS) at Q&A 276.

j. Claim 11

The record evidence shows that the MediaTek decoders do not satisfy all limitations of claim 11.

i. A system comprising:

The MediaTek [ ] used in the accused Funai H.264 products are each a system. CX-1597C (Reinman WS) at Q&A 276.

ii. a decoder configured to generate a codeword; and

The evidence shows that [ ] decoders each satisfy the limitation of "a decoder configured to generate a codeword." **[**] each include a decoder configured to generate a codeword. CX-1597C (Reinman WS) Q&A 277.

[

JX-0019C ; CX-0642

; CX-1597C].

iii. [ ]

[

CX-1597C

]. *See id.*

iv. (i) set an index value to a threshold in response to a first portion of said codeword having a first pattern,

For the reasons discussed above with respect to step (A) of claim 1, the evidence does not show that the MediaTek decoders satisfy this claim limitation.

v. (ii) add an offset to said index value based on a second pattern in a second portion of said codeword following said first portion in response to said first portion having said first pattern and

For the reasons discussed above with respect to step (B) of claim 1, the evidence does not show that the MediaTek decoders satisfy this claim limitation.

vi. (iii) add a value to said index value based on a third pattern in a third portion of said codeword following said second portion in response to said first portion having said first pattern.

For the reasons discussed above with respect to step (C) of claim 1, the evidence does not show that the MediaTek decoders satisfy this claim limitation.

4. Indirect Infringement

Complainants allege that Funai is liable for induced infringement and contributory infringement of claims 1-9 of the '663 patent. Compls. Br. at 277-82. As discussed above, Complainants have not established direct infringement of these claims. Nevertheless, the record evidence does establish that Funai would be liable for both induced infringement and contributory infringement of claims 1-9, in the event it is determined that there is direct infringement of these claims.[38]

a. Induced Infringement

The evidence shows that Funai markets the accused Funai H.264 products to U.S. consumers by featuring the accused H.264 high-definition playback functionality. *See* CX-1597C (Reinman WS) at Q&A 290. For example, the leaflet for [ ] states that "It is fully future proof as it supports 1080p signals from all sources, including the most recent like Blu-ray and advanced HD game consoles." *See* CX-0609 ([ ]) at 2. In addition, the same leaflet advertises H.264 as a playback format. *Id.* at 3. As another example, the leaflet for [ ] lists features such as "Blu-ray Disc playback." *See* CX-0124 ([ ]) at 1; CX-1597C (Reinman WS) at Q&A 290.

In addition, Funai creates and distributes product manuals for the accused Funai H.264 products that provide instructions regarding how to set-up and operate the products, including instructions that describe how to use the accused processes to play back H.264-compliant HD video. CX-1597C (Reinman WS) at Q&A 291. For example, the user manual for the

[38] The GR12 Filing indicates that this Initial Determination should address the issue of whether Funai indirectly infringes claim 11 of the '663 patent, but Complainants did not brief this issue. *See* GR12 Filing at 7; Compls. Br. at 277-82. Accordingly, the administrative law judge declines to make findings with respect to whether Funai indirectly infringes claim 11 of the '663 patent.

[ ] provides instructions on how to watch H.264-encoded and other MPEG videos using DLNA. *Id.*; CX-0046 ([ ]) at 15-16. In addition, the user manual for [ ] provides instructions on how to "use your Blue-ray disc/DVD player," which necessarily includes accused processes for UEGk decoding high-definition H.264-encoded Blu-ray discs. CX-0056 ([ ]) at 10; CX-1597C (Reinman WS) at Q&A 291. There are more such examples throughout the product literature for the accused Funai H.264 products. CX-1597C (Reinman WS) at Q&A 291 (listing specific product literature examples).

Moreover, the evidence shows that Funai provides, or arranges for the provision of, technical support to ensure that end users are able to operate all features of the accused Funai products in the United States, including the accused H.264-compliant high-definition video playback features. CX-1597C (Reinman WS) at Q&A 292. This technical support is made available through a website accessible in the United States, as well as through a U.S. Customer Support Line. *Id.* For example, the user manual for the [ ] states: "For further assistance, call the customer support service in your country." CX-0609 ([ ]) at 1. In addition, the manual states: "If you cannot resolve your problem, refer to the FAQ for this [ ]." *Id.* at 43. As another example, the user manual for the [ ] states: "If you still have a problem, [ ]." CX-0056 ([ ]) at 1, 25. There are more such examples throughout the product literature for the accused Funai H.264 products. *See* CX-1597C (Reinman WS) at Q&A 292.

Funai also provides warranty support for the accused Funai H.264 products in the event that a device is unable to perform the accused functionality. CX-1597C (Reinman WS) at Q&A 293; *see, e.g.*, CX-0046 ([ ]) at 45; CX-0056 ([ ]) at

68. Again, there are more such examples throughout the product literature for the accused Funai H.264 products. *See* CX-1597C (Reinman WS) at Q&A 293.

Funai had actual knowledge of the '663 patent no later than March 2012, when Complainants filed the complaint in this investigation and provided infringement claim charts to Funai. The record evidence discussed above demonstrates that, following institution of this investigation, Funai continued to provide marketing and product literature to its customers. The evidence also shows that Funai continued to provide technical and warranty support to its customers after this investigation was instituted.

Therefore, if the Commission were to reverse the finding of the administrative law judge that asserted method claims 1-9 of the '663 patent are not infringed, then Funai would be liable for induced infringement of these claims.

b. Contributory Infringement

The evidence shows that the accused Funai H.264 products [

]. *See* CX-1597C (Reinman WS) at Q&A 296. In particular, [

] from the H.264 Standard in the accused Funai H.264 products is essential for viewing high-definition H.264-compliant video, and that hardware is especially made to perform processes that are alleged to infringe claims 1-9 of the '663 patent. *Id.*

Furthermore, there are no substantial non-infringing uses for [

] in the accused Funai H.264 products. *Id.* at Q&A 298. Specifically, the accused Funai H.264 products cannot fully operate ([

]) without this hardware. *Id.* Moreover, there is no evidence that the [

]. *Id.* As described earlier in connection with the discussion of induced infringement, Funai has furnished this [ ] to end users of the accused Funai H.264 products with knowledge of the '663 patent since at least March 2012, when Complainants initiated this investigation.

Therefore, it is determined that Complainants have demonstrated that Funai would be liable for contributory infringement of claims 1-9 of the '663 patent in the event it is determined that there is direct infringement of these claims.

D. Validity

1. Priority Date

The '663 patent issued from Application No. 10/770,213 (filed February 2, 2004), which is a continuation of Application No. 10/191,596 (filed July 10, 2002). JX-0007. Complainants argue that the '663 patent is entitled to the July 10, 2002 priority date of its parent application. Compls. Br. at 16-20. Respondents contend that the claims of the '663 patent are entitled only to a priority date of March 4, 2005, when the applicants allegedly added new matter during the prosecution of the '663 patent. Resps. Br. at 277-305.

Specifically, Respondents cite to a March 4, 2005 office action response from the prosecution history of the '663 patent as supporting their priority date contentions, arguing that "the '663 patent applicant added new matter in the March 4, 2005 response." *See* RX-0007C (Schonfeld WS) at Q&A 368. An analysis of the prosecution history, however, demonstrates that the evidence does not support Respondents' argument.

A review of the complete prosecution history demonstrates that no "new matter" was added to the specification of the '663 patent on March 4, 2005. The specification of the '663 patent as originally filed included two tables of index values and their corresponding UEGk

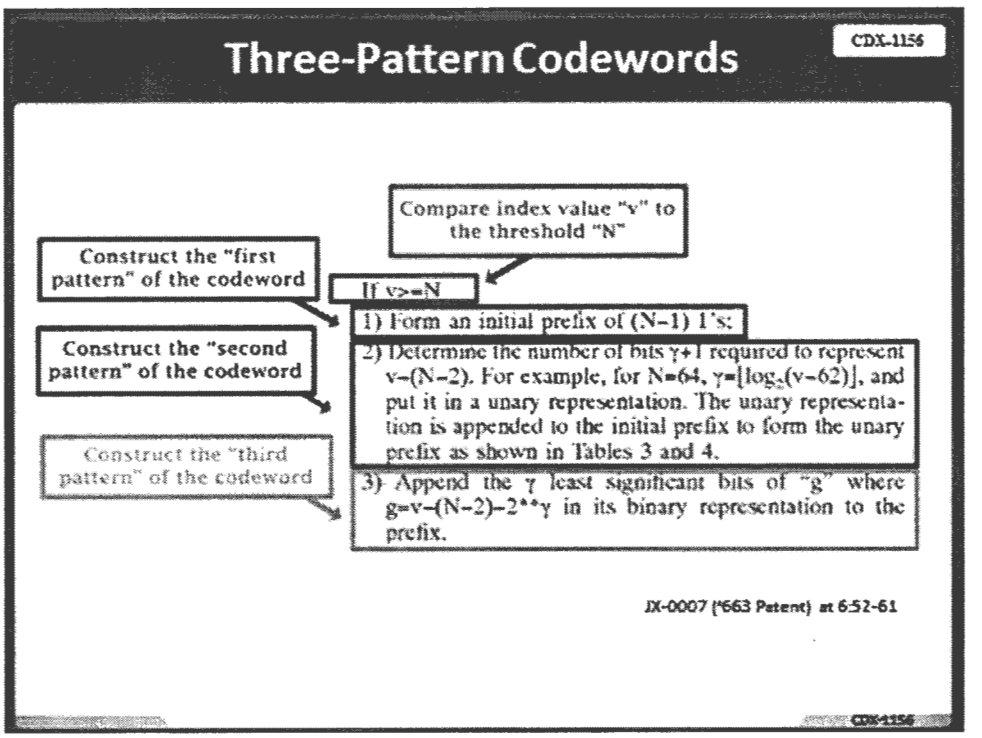
binarized codewords, *i.e.*, Table 3 and Table 4. See JX-0008 ('663 file history) at 16-17. On December 2, 2004, the PTO issued an action requiring amendment to the drawings, and specifically instructed that "[n]o new matter should be entered." *Id.* at 73. The applicant responded to that office action on March 4, 2005, indicating that "Tables 3 and 4, as originally filed, are moved into new FIGS. 5 and 6 each with an added line for clarity. Thus, no new matter has been added." *Id.* at 94. Other than the "added line for clarity," nothing else changed in Tables 3 and 4 other than the tables were turned into Figures 5 and 6. *Compare id.* at 16-17 *with id.* at 107-08; Reinman Tr. 749-750; Schonfeld Tr. 1624, 1625. Following this office action response, the PTO allowed all of the claims. JX-0008 ('663 file history) at 115. The PTOdid not reject any claims on the basis of the "added line for clarity" being new matter. *Id.*; Reinman Tr. 750.

Inasmuch as the PTO allowed the "added line for clarity" without objection, Respondents face an especially high burden in proving that the '663 patent is not entitled to the July 10, 2002 priority date of its parent application. "[I]n the context of a validity challenge based on new matter, the fact that the United States Patent and Trademark Office ('PTO') has allowed an amendment without objection 'is entitled to an especially weighty presumption of correctness' in a subsequent validity challenge based on the alleged introduction of new matter." *Commonwealth Sci. & Indus. Research Org. v. Buffalo Tech. (USA), Inc.*, 542 F.3d 1363, 1380 (Fed. Cir. 2008).

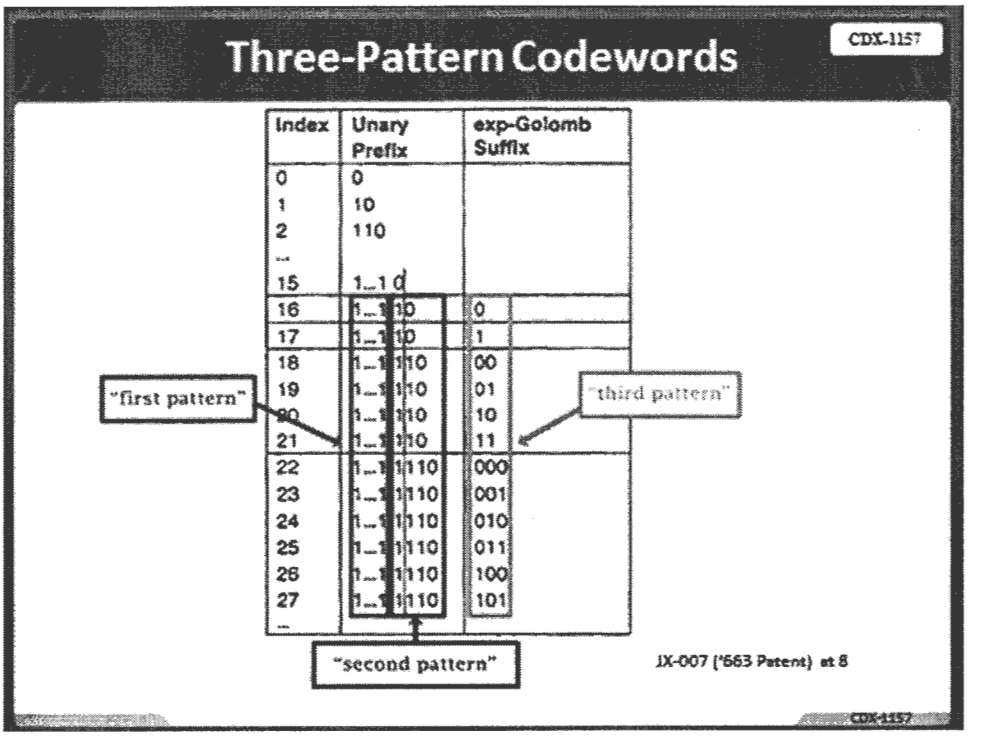
Respondents have not met their burden to adduce clear and convincing evidence that the "added line for clarity" constitutes "new matter" affecting the asserted claims of the '663 patent. Each of the asserted claims of the '663 patent involves generating an "index value" by analyzing each of three patterns used to form the corresponding "codeword" and taking certain actions as

appropriate. JX-0007 ('663 patent) at col. 7, ln. 31 – col. 8, ln. 25; CX-1644C (Richardson RWS) at Q&A 51. None of the asserted claims of the '663 patent reference or require the "added line for clarity" introduced in the March 4, 2005 office action response, as one of ordinary skill in the art can identify the three separate patterns in Figures 5 and 6 with or without the added line. *See* CX-1644C (Richardson RWS) at Q&A 51.

Specifically, the three patterns shown in Figures 5 and 6 trace back to the representative UEGk binarization process described at column 6, lines 44-63 of the '663 patent. *See id.* at Q&A 48-50. This is illustrated below in CDX-1156 (Richardson 007):

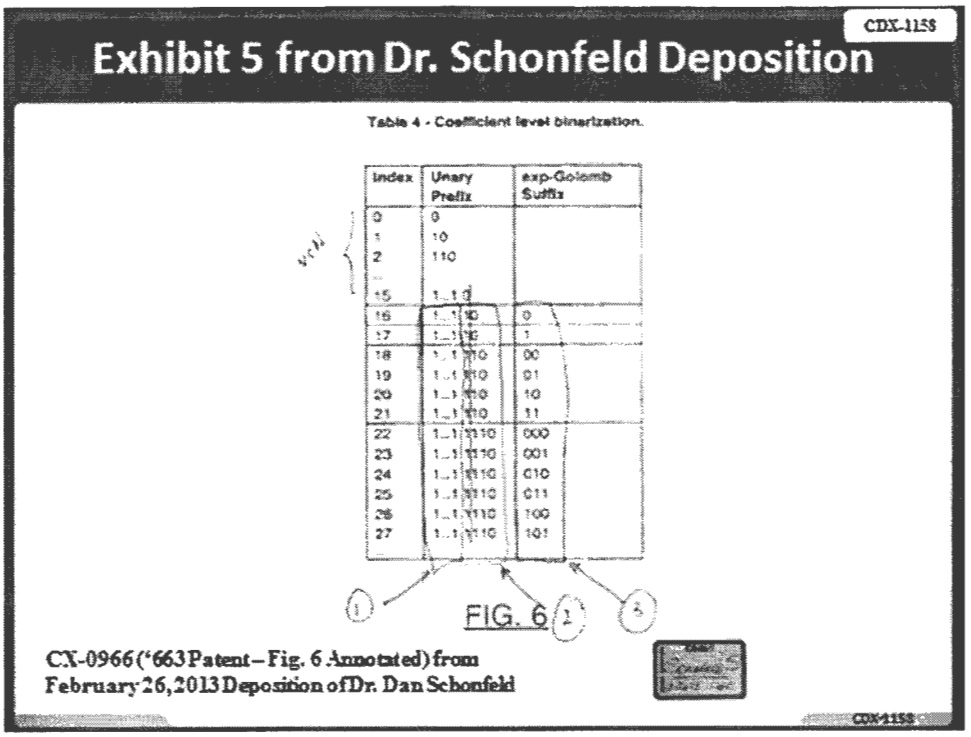


The three-pattern codewords generated from this process are found, for example, in Figure 6 (for index values above the threshold N=16). *See id.* This is seen below in CDX-1157 (Richardson 008):



Thus, the three patterns described in the asserted claims of the '663 patent would have been apparent to one of ordinary skill in the art, regardless of the presence of the vertical line. *Id.* at Q&A 51. Indeed, the "added line for clarity" does nothing more than clarify that an additional embodiment of the asserted claims can be identified in the existing tables from Figures 5 and 6. *See* Reinman Tr. 748.

Moreover, Respondents' expert Dr. Schonfeld, in reviewing column 6, lines 47-63 of the '663 patent, identified three distinct patterns in Figure 6 without any reliance on the "added line for clarity." *See id.* at Q&A 52; Schonfeld Tr. 1620-1622. This is demonstrated by Dr. Schonfeld's annotations of Figure 6 in CX-0966 ('663 Patent - Fig. 6 Annotated), shown below in CDX-1158 (Richardson 009):



See Schonfeld Tr. 1620-1622. Therefore, because none of the asserted claims of the '663 patent references or is reliant upon the "added line for clarity" from the March 4, 2005 office action, each of the asserted claims is entitled to the July 10, 2002 priority date of the '663 patent parent application. *See* CX-1644C (Richardson RWS) at Q&A 54.

2. Indefiniteness

Respondents argue that all asserted claims of the '663 patent are invalid for indefiniteness. *See* Resps. Br. at 354-55. For the reasons discussed previously with respect to the construction of the disputed claims terms, Respondents have not shown clearly and convincingly that any of the disputed claims terms are not amenable to construction or are insolubly ambiguous. Therefore, it is determined that none of the asserted claims are invalid for indefiniteness based on the disputed claim terms.

Respondents separately argue that claim 11 is indefinite because it combines function and apparatus elements in the same claim. Resps. Br. at 355-56. An apparatus claim such as claim

11 is not indefinite where it includes limitations that merely indicate the apparatus is "capable of performing the recited functions." *See Microprocessor Enhancement Corp. v. Tex. Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008). The language from claim 11 describes what the claimed "circuit" is "configured to" accomplish (*i.e.*, what it is "capable of performing"). JX-0007 ('663 patent) at col. 8, lns. 14-25. It is therefore determined that claim11 is not invalid for indefiniteness based on Respondents' argument that it combines function elements with apparatus elements.

3. Written Description

Respondents argue that "the specification of the '663 patent fails to provide a proper written description for any of the asserted claims to reasonably convey to one of ordinary skill in the art that the inventor had possession of the claimed subject." *See* Resps. Br. at 352-54. In particular, Respondents argue that the '663 specification does not provide any written description for how to perform the decoding process claimed in asserted claims 1-9 and 11. *Id.* at 353-54.

Respondents, however, have not adduced clear and convincing evidence that any asserted claim is invalid due to failure to satisfy the written description requirement.

For instance, Respondents' expert Dr. Schonfeld alleges "the '663 patent specification only describes decoding in Fig. 3 and at col. 4, lines 13-23." RX-0007C (Schonfeld WS) at Q&A 604. This testimony, however, overlooks the decoder process flow depicted in Figure 1, and the accompanying description of how such decoder "reverses the steps applied by encoder." *See* JX-0007 ('663 patent) col. 3, lns. 8-10; Fig. 1.

Moreover, Figure 4 of the '663 patent depicts "a flowchart of a process for codeword construction" using the unary/exp-Golomb ("UEGk") hybrid binarization approach disclosed in the '663 patent. *See* JX-0007 ('663 patent) at col. 6, lns. 64-65. In particular, Figure 4 discloses

a series of steps taken that are contingent on whether "the code symbol index is less than the value of the threshold." *Id.* at col. 7, lns. 1-4. As taught by the specification, the decoding of these novel UEGk codewords (*i.e.*, the process described in the asserted claims) is performed by "revers[ing] the steps" of the UEGk codeword construction shown generally in Figure 4 to arrive at the original index value. *See id.* at col. 3, lns. 8-10; CX-1644C (Richardson RWS) at Q&A 146.

Further, in column 6, lines 44-63, the '663 patent provides a "detailed description of the method for constructing such hybrid binarizations" using an encoder. CX-1644C (Richardson RWS) at Q&A 145. One embodiment of the asserted claims "reverses the steps applied by [the] encoder" during this UEGk encoding process. *See, e.g.*, Reinman Tr. 647-648; JX-0007 ('663 patent) at col. 3, lns. 8-10. Moreover, during the evidentiary hearing, testimony showed that the specification disclosed two additional embodiments of the asserted claims. Reinman Tr. 704.

Therefore, there is support in the specification of the '663 patent for the UEGk decoding process described in the asserted claims. Accordingly, it is determined that Respondents have not prevailed on their written description defense.[39]

4. Patentable Subject Matter

Respondents argue that the asserted claims of the '663 patent are invalid under 35 U.S.C. § 101 for failure to claim patentable subject matter. Resps. Br. at 317-38. As discussed below, it is determined that Respondents have not prevailed in this defense.

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[39] The GR12 Filing also indicates that this Initial Determination should address the issue of whether the asserted '663 claims are invalid for lack of enablement. GR12 Filing at 8. Respondents, however, did not address this issue in their brief. *See* Resps. Br. at 352-56; Compls. Reply at 76. Accordingly, the administrative law judge declines to make any findings on the issue of whether the asserted '663 claims are invalid for lack of enablement.

As in initial matter, all the asserted claims of the '663 patent are patent eligible under Section 101 because each satisfies the "machine" prong of the Federal Circuit's machine-or-transformation test. The Federal Circuit defines "machine" in this context as:

> [A] concrete thing, consisting of parts, or of certain devices and combination of devices. This includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result.

SiRF Tech., Inc. v. Int'l Trade Comm'n, 601 F.3d 1319, 1332 (Fed. Cir. 2010).

A "machine," *i.e.*, a "decoder" used in the decompression of digital video, is integral to each of the asserted claims of the '663 patent. Claims 1-9 of the '663 patent are directed to "generating an index value from a codeword for digital video decoding," which is a process performed by digital video decoder. *See* JX-0007 ('663 patent) at col. 7, lns. 32-33. Similarly, in claim 11, a "decoder" is an express element of the system claim. *Id.* at col. 8, ln. 15. Moreover, each of the asserted claims involves "codewords" and "index values." As described in the '663 patent, these claimed "codewords" and "index values" represent specific data structures used exclusively in video encoders/decoders "such as transformed-quantized picture differences and motion vector residuals." *Id.* at col 4, lns. 44-45. As such, none of the asserted claims has meaning or application outside of a decoder used for decoding video.

Although satisfaction of only one prong of the Federal Circuit's machine-or-transformation test proves a claim is patent eligible under Section 101, the asserted claims of the '663 patent satisfy the second "transformation" prong as well as the first "machine" prong. The Federal Circuit has held that "the transformation of [] raw data into a particular visual depiction of a physical object on a display was sufficient" to render a particular process claim "patent-eligible" under Section 101. *In re Bilski*, 545 F.3d at 963. Moreover, the Federal Circuit

emphasized "for clarity" that "the electronic transformation of the data itself into a visual depiction . . . was sufficient; the claim was not required to involve any transformation of the underlying physical object that the data represented." *Id.*

Each of the asserted '663 claims is directed to "the transformation of [] raw data into a particular visual depiction of a visual object." *See id.* Specifically, the processes of claims 1-9 of the '663 patent are used "for generating an index value from a codeword for digital video decoding." JX-0007 ('663 patent) at col. 7, lns. 32-42. Claim 11 similarly describes a system that takes a "codeword" created by a "decoder" module and, using a "circuit," generates an "index value" from that "codeword." *Id.* at col. 4, lns. 24-25. In other words, the inventions claimed in the asserted claims take raw binarized "codeword" data received in a compressed digital video bit stream and transform the data into "index values" representing symbols "such as transformed-quantized picture differences and motion vector residuals" that instruct the decoder how to recreate the video image "that is delivered to the user." *Id.* at col. 4, lns. 44-45; col. 3, lns. 8-10. This "electronic transformation of the data itself into a visual depiction" is "sufficient" to satisfy the transformation prong of the machine-or-transformation test. *See In re Bilski*, 545 F.3d at 963.

In addition to satisfying both prongs of the Federal Circuit's machine-and-transformation test, the asserted claims of '663 patent also are patent-eligible under Section 101 because they represent narrow functional applications in the field of computer technology. "[I]nventions with specific applications or improvements to technologies in the marketplace are not likely to be so abstract that they override the statutory language [of § 101]." *Research Corp.*, 627 F.3d at 869. The asserted claims of the '663 patent each disclose a "binarization method" that "will reduce the complexity and the bitrate/size for compressing and decompressing video, images, and

signals that are compressed using binary arithmetic encoding for entropy encoding." JX-0007 ('663 patent) at col. 2, lns. 6-11. Therefore, like the patented inventions in *Research Corporation*, the inventions claimed in the '663 patent present "functional and palpable applications in the field of computer technology" and "are directed to patent-eligible subject matter." *See Research Corp.*, 627 F.3d at 868-69. As a result, "the process claims at issue, which claim aspects and applications of the same subject matter, are also patent-eligible." *See id.* at 869.

Inasmuch as the asserted claims of the '663 patent satisfy both prongs of the Federal Circuit's machine-or-transformation test for patent-eligibility, and inasmuch as the asserted claims represent narrow functional applications in the field of computer technology, it is therefore determined that Respondents have not prevailed in their Section 101 defense.

5. The JVT-C162-L Reference

Respondents argue that the JVT-C162-L proposal (RX-0740) renders obvious the asserted claims of the '663 patent. Resps. Br. at 306-09. JVT-C162-L is a proposal written the Lowell Winger, the named inventor of the '663 patent, for the Joint Video Team ("JVT") of ISO/IEC MPEG and ITU-T Video Coding Expert Group ("VCEG") entitled "Putting a Reasonable Upper Limit on Binary Expansion." RX-0740. JVT-C162-L was downloaded to a publicly available FTP site on or about May 2, 2002 in advance of the JVT 3rd Meeting in Fairfax, Virginia on May 6-10, 2002, and was therefore publicly available no later than the time of that conference. *See* JX-036C (Lindbergh Dep.) 71-73; RX-0003C (Lindbergh WS) at Q&A 26-34.

Respondents cannot prevail in their obviousness argument, however, because JVT-C162-L does not constitute prior art to the '663 patent.

As discussed previously, the asserted claims of the '663 patent are entitled to the July 10, 2002 filing date of the '663 patent parent application. Thus, in order to constitute prior art, the published reference must have been authored by someone other than the inventor of the patent. Inasmuch as Lowell Winger, the sole inventor named on the '663 patent, is also the sole author of JVT-C162-L, JVT-C162-L does not constitute prior art to the asserted claims of the '663 patent. CX-1644C (Richardson RWS) at Q&A 176.

6. The VCEG-P07 Reference

Respondents also allege that the VCEG-P07 reference renders obvious the asserted claims of the '663 patent. Resps. Br. at 309-13. VCEG-P07 is a draft of the H.264 video compression standard of the Joint Video Team ("JVT") of ISO/IEC MPEG and ITU-T Video Coding Expert Group ("VCEG"). VCEG-P07 was publicly available within a few weeks of the JVT 3rd Meeting in Fairfax, Virginia on May 6-10, 2002, as well as the VCEG16th Meeting in Fairfax, Virginia also on May 6-10, 2002. RX-0003C (Lindbergh WS) at Q&A 35-40.

Respondents cannot prevail in their obviousness argument, however, because VCEG-P07 does not constitute prior art to the '663 patent.

Given the July 10, 2002 priority date of the '663 patent, the relevant content of the VCEG-P07 must be written by someone other than the inventor of the '663 patent in order to constitute prior art. *See* 35 U.S.C. § 102(a). Respondents have not presented any evidence showing or suggesting that the relevant sections of VCEG-P07 are attributable to anyone other than Lowell Winger, the sole inventor named on the '663 patent. Therefore, VCEG-P07 is not prior art to the '663 patent, and Respondents have not prevailed in their obviousness defense.[40]

[40] Moreover, by contending that all of the asserted claims of the '663 patent are invalid over the JVT-C162-L proposal which was published "on or around May 2, 2002," Respondents have, in

VII. The '958 Patent

A. The Asserted Claims and Accused Products

Asserted U.S. Patent No. 6,452,958 ("the '958 patent") is titled, "Digital Modulation System Using Extended Code Set." JX-0003 ('958 patent). The '958 patent issued on September 17, 2002, and the named inventor is Richard D. J. van Nee. *Id.* The '958 patent relates generally to "[a] digital (de)modulation system." *Id.* at Abstract.

LSI asserts independent claims 22, 29, 32, and 35, and dependent claims 23-26 against Funai and Realtek. The relevant claims are as follows:

> **22.** A digital modulation system for modulating data bits, comprising:
>
> a serial-to-parallel converter that groups the data bits, and
>
> a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N, and wherein the code set is derived from a complementary code that provides autocorrelation sidelobes suitable for multipath environments.
>
> **23.** The digital modulation system according to claim 22, further comprising a mixer that modulates a carrier signal in accordance with the chosen code.
>
> **24.** The digital modulation system according to claim 23, wherein the mixer modulates the phase of at least one carrier signal in accordance with the selected code.
>
> **25.** The digital modulation system according to claim 24, wherein the phase of the at least one carrier signal is QPSK modulated in accordance with the selected code.

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effect, admitted that Lowell Winger invented and implemented the asserted '663 patent claims no later than May 2, 2002. Inasmuch as May 2, 2002 predates the purported public availability of VCEG-P07, Respondents effectively concede that VCEG-P07 is not prior art under 35 U.S.C. § 102(a). *See* CX-1644C (Richardson RWS) at Q&A 183.

26. The digital modulation system according to claim 22, further comprising a scrambler for scrambling the group of data bits.

29. A digital modulation system for modulating data bits, comprising:

a serial-to-parallel converter that groups the data bits, and

a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N, and wherein the code set is derived from a complementary code,

wherein the complementary code is defined by the sequence ABAB′, such that A is a sequence of elements and B is a sequence of elements and wherein B′ is derived by inverting all elements in the sequence B.

32. A digital modulation system for modulating a group of data bits, comprising:

a scrambler for scrambling the group of data bits, and

a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M >N, and wherein the code set is derived from a complementary code that provides autocorrelation sidelobes suitable for multipath environments.

35. A digital modulation system for modulating a group of data bits, comprising:

a scrambler for scrambling the group of data bits, and

a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N, and wherein the code set is derived from a complementary code,

wherein the complementary code is defined by the sequence ABAB′, such that A is a sequence of elements and B is a sequence of elements and wherein B′ is derived by inverting all elements in the sequence B.

JX-0003 at col. 12, lns. 50-67; col. 13, lns. 1-3; col. 13, lns. 10-21; col. 13, lns. 38-46; col. 13, lns. 53-64.

Complainants accuse the following products of infringing the '958 Patent: (1) Realtek's products that are compliant or compatible with the applicable 802.11 standards described for CCK modulation; and (2) Funai's products that (a) are compatible with the applicable 802.11 standards described for CCK modulation; (b) contain at least one of Realtek's products; or (c) contain at least one of Ralink's products that are compatible with the applicable 802.11 standards described for CCK modulation. Compls. Br. at 45.[41]

Complainants provide the following table purporting to summarize Funai's products accused of infringing the '958 Patent and the '867 Patent, along with the WiFi chip supplier for each product and documentation showing 802.11 compatibility:

			]

[41] Complainants also accuse of infringement certain Funai products that contain chips from ["]). These products will be addressed separately in the section addressing Complainants' infringement arguments.

[			
			]

Compls. Br. at 46-47.

Complainants provide the following table purporting to summarize Realtek's products accused of infringing the '958 Patent and the '867 Patent, along with the documentation showing 802.11 compatibility:

[		
		]

[		

[		
	]	]

Compls. Br. at 47-49.

Complainants provide the following table purporting to list the Ralink products at issue with respect to the '958 Patent and the '867 Patent, along with the documentation showing 802.11 compatibility:

[		

[		
		]

Compls. Br. at 50.

B. Claim Construction

1. Level of Ordinary Skill

A person of ordinary skill in the art relevant to the '958 patent at the time of the invention had at least a master's degree in electrical engineering or a related field, and at least three years of experience and knowledge in digital communications or a related field. The Master's degree can be substituted by at least one year of training or additional work experience in the area of digital communications or a related field. *See* RX-0006C (Heegard WS) at Q&A 90-94.[42]

2. "chip"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"chip"	No construction necessary. Alternatively, "a code bit (as distinguished from a data bit)"	"a code bit (as distinguished from a data bit"

[42] Complainants argue that a person of ordinary skill in the relevant art at the time of the invention of the '958 patent would be someone with a BSEE or equivalent and at least two years of experience in developing or implementing wireless baseband algorithms or circuits at the PHY layer. Compls. Br. at 34 (citing CX-1596C (Negus WS) at Q&A 132). The parties have not identified any way in which differences in their proposed definitions of the level of ordinary skill in the art affect issues in this investigation. *See id.*

The parties agree that the claim term "chip," as used in asserted claims 22, 29, 32, and 35 of the '958 patent, should be construed to mean "a code bit (as distinguished from a data bit)." *See* Compls. Br. at 368; Resps. Br. at 55. Therefore, the claim term "chip" is construed to mean "a code bit (as distinguished from a data bit)."

3. "code"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"code"	No construction necessary. Alternatively, "a sequence of chips"	"a sequence of chips representing a real value"

The claim term "code" appears in asserted claims 22, 23-25, 29, 32, and 35 of the '958 patent. Complainants argue that no construction is necessary, but that if it is determined that "code" needs construction, it should be construed to mean "a sequence of chips." Compls. Br. at 368-70. Respondents argue that "code" should be construed to mean "a sequence of chips representing a real value." Resps. Br. at 55-62.

As proposed by Respondents, the claim term "code" is construed to mean "a sequence of chips representing a real value." This construction is consistent with the intrinsic evidence, and reflects the understanding of a person of ordinary skill in the art at the time of the '958 invention.

The intrinsic evidence requires restricting the claims to real codes because that is all the '958 specification discloses and allows. The stated purpose of the '958 patent, which is to overcome the limitation of "conventional M-ary keying systems" where "the number of possible codes M is not more than the code length N in chips," makes clear that the claim limitation "code" encompasses only real codes. *See* JX-0003 ('958 patent) at col. 4, lns. 61-64; Katti Tr. 1795-1797; RX-2813C (Heegard RWS) at Q&A 93 ("[I]f the 'code length N in chips' were

construed to include 'complex chips,' a greater number than N orthogonal sequences of 'complex' length N would exist; accordingly, the patent's description of both its purported problem and its purported solution would be inaccurate."); Negus Tr. 457-458. As Respondents' expert Dr. Heegard testified, "[o]ne of ordinary skill would understand that within the context of the patent, the inventor was describing real valued codes, or even integer valued codes, since there is never an inkling of a non-zero imaginary part to these codes." RX-2813C (Heegard RWS) at Q&A 90.

The only codes described in the '958 patent are set forth in Tables 1, 2, and 3 of the specification. JX-0003 ('958 patent) at col. 5, ln. 25 – col. 6, ln. 40; RX-2811C (Vojcic WS) at Q&A 36, Q&A 113; RX-2813C (Heegard RWS) at Q&A 31, Q&A 86-91. All of the codes are binary and, therefore, real. *See* RX-2813C (Heegard RWS) at Q&A 31, Q&A 86-91. Complainants' expert Dr. Negus [

]. *See* RX-2837C ([ ].) at 102-104.

By contrast, Complainants' proposed construction considers the real codes as "complex" codes with the imaginary part always set to zero. This proposed construction has already been rejected in previous litigation. RX-1345 (*Sony* Order) at 7-8; RX-2811C (Vojcic WS) at Q&A 109-11, Q&A 140; RX-2813C (Heegard RWS) at Q&A 98-99.

Moreover, the embodiments depicted in the '958 specification are designed for real codes, and not complex codes. Specifically, the system shown in Figure 3 of the '958 patent cannot accommodate complex codes, because it cannot place the imaginary part on one channel and the real part on the other channel. JX-0003 ('958 patent) at col. 7, lns. 11-34; RX-2811C (Vojcic WS) at Q&A 116-19; RX-2813C (Heegard RWS) at Q&A 86-91. Similarly, the "fallback mode" illustrated in Figures 4 and 7 requires the simultaneous transmission of the same

code on the I and Q channels, which can be achieved only with real codes, and not complex codes. *See* RX-1345 (*Sony* Order) at 7-8; JX-0003 ('958 patent) at col. 8, lns. 46-50; col. 9, lns. 52-64; RX-2811C (Vojcic WS) at Q&A 120-21; RX-2813C (Heegard RWS) at Q&A 86-91.

Complainants' proposed construction, which expands the definition of "code" to include complex codes, contradicts their agreed-upon construction of the term "chip" as "a code bit." A chip, or code bit, is "binary" and can take on only one of two values, whereas a complex chip has both real and imaginary dimensions. RX-2813C (Heegard RWS) at Q&A 43. Complex codes use "complex chips," which require more than one bit, are not binary, and therefore are not "chips." RX-2811C (Vojcic WS) at QA 121; RX-2813C (Heegard RWS) at Q&A 92, Q&A 80-84. As an example, Figure 2 of the '958 specification "shows a digital modulator 28 according to the principles of the present invention." JX-0003 ('958 patent) at col. 4, lns. 22-24. Each chip in the selected "code" is binary, inasmuch as the figure refers to "1" times the number of chips N, *i.e.*, one bit per chip. JX-0003 ('958 patent) at Fig. 2; RX-2813C (Heegard RWS) at Q&A 71-79.

Complainants also take the position that a complex code can be modulated "independently" on the I and Q channels because the real and imaginary parts of the code can be modulated "independently" on the I and Q channels. *See* CX-1641C (Katti WS) at Q&A 125. This position is not persuasive, however, because decoding complex codes requires knowledge of both the I and Q channels, so that the two channels cannot be "independent." RX-2811C (Vojcic WS) at Q&A 116, Q&A 122, Q&A 156-57; RX-0006C (Heegard WS) at Q&A 283; RX-2813C (Heegard RWS) at Q&A 87-93, Q&A 175-187. Named inventor Mr. van Nee [

].

RX-1787C ([ ].) at 119, 129-130, 150-151, 160; RX-1788C ([

].) at 33, 37-38, 49-50; RX-1789C ([ ].) at LSIAgere837-01077136-37.

Therefore, the claim term "code" is construed to mean "a sequence of chips representing a real value."

4. "a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N"	No construction necessary. Alternatively, "the number of codes in the set from which a selected code is chosen must always exceed the number of chips in each code of the set"	"the number of codes in the set from which a selected code is chosen (M) must always exceed the number of bits in each code of the set (N)"

The claim limitation "a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N" appears in asserted claims 22, 29, 32, and 35 of the '958 patent. Complainants take the position that no construction is necessary for this term, but agrees to the alternative construction of "the number of codes in the set from which a selected code is chosen must always exceed the number of chips in each code of the set" in the event it is determined that construction is necessary. *See* Compls. Br. at 368. Respondents argue that the term should be construed to mean "the number of codes in the set from which a selected code is chosen (M) must always exceed the number of bits in each code of the set (N)." Resps. Br. at 62-63.

It is therefore determined that the claim limitation "a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein

M>N" should be construed to mean "the number of codes in the set from which a selected code is chosen (M) must always exceed the number of bits in each code of the set (N)."

5. "autocorrelation sidelobes suitable for multipath environments"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"autocorrelation sidelobes suitable for multipath environments"	No construction necessary. Alternatively, "autocorrelation sidelobes that can be used in multipath environments"	Indefinite.

The claim term "autocorrelation sidelobes suitable for multipath environments" appears in asserted claims 22 and 32 of the '958 patent. Complainants take the position that no construction is necessary for this term. *See* Compls. Br. at 370, 397-98. Respondents argue that this claim term is indefinite. *See* Resps. Br. at 63, 101-05. As discussed below in the section of this Initial Determination that addresses the validity of the '958 patent, it is determined that the claim term "autocorrelation sidelobes suitable for multipath environments" is not indefinite.

C. Infringement

1. The Accused CCK Functionality of the 802.11 Standards

Complainants accuse Respondents' products of infringing the asserted claims of the '958 patent [

] *See, e.g.*, CX-1596C (Negus WS) at Q&A 135.

CCK modulation according to the IEEE 802.11b standard involves selecting complex, not real, codes. The standard describes each CCK code word as "8 complex chips" long:

18.4.6.5 Spreading sequences and modulation for CCK modulation at 5.5 Mb/s and 11 Mb/s

For the CCK modulation modes, the spreading code length is 8 and is based on complementary codes. The chipping rate is 11 Mchip/s. The symbol duration shall be exactly 8 complex chips long.

The following formula shall be used to derive the CCK code words that shall be used for spreading both 5.5 Mb/s and 11 Mb/s

$$c = \{e^{j(\varphi_1+\varphi_2+\varphi_3+\varphi_4)}, e^{j(\varphi_1+\varphi_3+\varphi_4)}, e^{j(\varphi_1+\varphi_2+\varphi_4)}, -e^{j(\varphi_1+\varphi_4)}, e^{j(\varphi_1+\varphi_2+\varphi_3)}, e^{j(\varphi_1+\varphi_3)}, -e^{j(\varphi_1+\varphi_2)}, e^{j\varphi_1}\} \quad (18\text{-}1)$$

where C is the code word

C = {c0 to c7}

The terms φ1, φ2, φ3, and φ4 are defined in 18.4.6.5.2 for 5.5 Mb/s and 18.4.6.5.3 for 11 Mb/s.

This formula creates 8 complex chips (c0 to c7), where c0 is transmitted first in time.

This is a form of the generalized Hadamard transform encoding, where φ1 is added to all code chips, φ2 is added to all odd code chips, φ3 is added to all odd pairs of code chips, and φ4 is added to all odd quads of code chips.

The term φ1 modifies the phase of all code chips of the sequence and shall be DQPSK encoded for 5.5 Mb/s and 11 Mb/s. This shall take the form of rotating the whole symbol by the appropriate amount relative to the phase of the preceding symbol. Note that the chip c7 of the symbol defined above is the chip that indicates the symbol's phase and is transmitted last.

CX-0116C (802.11b Standard) at CX-0166C.0723-24. Each "complex chip" is a pair of bits, one pair representing the real component of a complex value, and the other pair representing the imaginary component. RX-2813C (Heegard RWS) at Q&A 142-44; RX-2813C-1 (Heegard RWS Errata) at Q&A 2. Inasmuch as the two bits of a "complex chip" represent the real and imaginary components of a complex value, each CCK codeword represents a complex value. RX-2813C (Heegard RWS) at Q&A 142-44, Q&A 167, Q&A 169-74. Complainants' expert Dr. Negus confirmed that this is considered "complex-valued notation," in which "a 'complex value' is expressed as a real part plus an imaginary part." RX-1596C (Negus WS) at Q&A 78-80.

Inasmuch as the accused CCK functionality uses complex codes, and inasmuch as the '958 claim term "code" is construed to mean "a sequence of chips representing a real value," the

accused products do not infringe any asserted claim of the '958 patent. Complainants and their expert Dr. Negus nevertheless take the position that the accused products infringe even under the adopted construction of "code."

In support of Complainants' infringement argument, Dr. Negus testified that he has not formed an opinion on what the 802.11b standard means by a "complex chip." Negus Tr. 309-310. He also testified that he did not know the industry has a belief that CCK modulation generates a sequence of complex chips. Negus Tr. 310. When describing CCK modulation, Dr. Negus did not use the phrase "complex codes," but instead stated that CCK modulation involved a code set of 64 codes of "8 phase-modulation chips" in length. *See* CX-1596C (Negus WS) at Q&A 84-87. His own paper on CCK, however, described CCK modulation as "pick[ing] one of 64 complex codes." RX-2836 (Negus WLAN History paper) at 8; Negus Tr. 326-328. He also testified that the CCK waveform is a "complex" waveform "defined to determine the complex chip code." Negus Tr. 333-334. He further testified to several examples of references referring to CCK modulation as having "complex codes," but did not identify any reference that refers to CCK as having real codes. Negus Tr. 314-315, 334-335.

2. Complainants' Reliance on HDL Code to Show Infringement

The Hardware Description Language (HDL) code for the Accused Products provides specific functionality for the applicable 802.11 standards. CX-1596C (Negus WS) at 41, Q&A 135. HDL code is a type of source code that describes the structure and function of electronic circuits. *Id.* The CCK and synchronization functionality at issue in this investigation are implemented in the form of electronic circuits, and thus HDL code describes the relevant functionality. *Id.* Complainants' expert Dr. Negus analyzed all the HDL code that was made available to him for products that Complainants allege infringe the '958 and '867 patents. *Id.* at

Q&A 138. In some instances, counsel for Respondents stipulated that [

] *Id.* In addition to HDL code, Complainants' expert Dr. Negus also relies on product datasheets, manuals, and portions of the 802.11 Standard for his infringement analysis of the '958 accused products. *See id.* at Q&A 136.

Ralink produced a subset of the overall HDL code for its products, and Dr. Negus analyzed everything that was provided to him. *Id.* at Q&A 139. Dr. Negus found [

] to his infringement analysis of the '958 and '867 patents among the various HDL code excerpts available to him from different Ralink products. *See id.*

Realtek provided access to all of the HDL code for the entirety of all the products alleged to be part of this case. After analyzing this code, Dr. Negus identified the appropriate HDL code sections relevant to his infringement analysis. *Id.* at Q&A 140. For the '958 patent, Dr. Negus found that [

] *Id.* [

] *See, e.g.*, [ ] Tr. 1195; Vojcic Tr. 1212.

3. Claim 22

The record evidence does not show that the accused products satisfy all limitations of claim 22.

a. A digital modulation system for modulating data bits, comprising:

i. 802.11

Respondents' products are [

] CX-1596C (Negus WS) at Q&A 176; CX-0116C (802.11 Standard, Jun. 2007) at §§ 18.1.1, 18.4, 18.4.5.3, 18.4.6.3, 18.4.6.5, 18.4.6.5.3.

ii. [ ]

[

].

iii. Realtek

Datasheets for Realtek's chips state that [ ] is supported for [ ] *See, e.g.*, CX-0571C [ ]) at 5; CX-0572C [ ]) at 7; CX-0573C [ ]) at 5; CX-0576C [ ]) at 5; CX-0577C [ ]) at 5; CX-0578C [ ]) at 5; CX-0579C [ ]) at 11; CX-0580C [ ]) at 7; CX-0581C [ ]) at 7; CX-0582C [ ]) at 6; CX-0583C [ ]) at 6; CX-0584C [ ]) at 5; CX-0585C [ ]) at 5; CX-0586C [ ]) at 3; CX-0127 [ ]) at 1; CX-1596C (Negus WS) at Q&A 179.

iv. Funai

For those Funai products that interoperate with 802.11 standards devices and incorporate at least one of Ralink's chips or Realtek's chips, the same evidence described above shows that this claim element is met by structure within Funai products. *See* CX-1596C (Negus WS) at Q&A 180; CX-0587C (Funai Source Code) at FUNAI-ITC837-SC-00000073.

b. a serial-to-parallel converter that groups the data bits, and

i. 802.11

[ ] Respondents' products are [ ] *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at § 18.4.6.5.3; CX-1596C (Negus WS) at Q&A 182. [ ] *Id.* at Q&A 183. [

] *Id.* at Q&A 184; CX-0116C (802.11 Standard, Jun. 2007) at § 18.4.6.5.3. [ ] *Id.* at Q&A 183.

ii. Ralink

[

] *See, e.g.*, CX-0561C (Ralink Source Code) at 837RALINK_SC0000001-4; CX-1596C (Negus WS) at Q&A 185.

iii. Realtek

Realtek's chips include a structure [

] The presence of a structure [

] is evident from [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002844,8,9; CX-1596C (Negus WS) Q&A 186. [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002848-49, 54; CX-1596C (Negus WS) at Q&A 186.

iv. Funai

For those Funai products that interoperate with 802.11 standards devices and incorporate at least one of Ralink's chips or Realtek's chips, the same evidence described above shows that this claim limitation is met by structure within Funai products. CX-1596C (Negus WS) at Q&A 187.

c. a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N, and

Each of the asserted claims 22-26, 29, 32 and 35 of the '958 patent recites "a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes." The term "code" is construed to mean "a sequence of chips representing a real value." As discussed above, the accused [

] Therefore, it is determined that the accused products do not satisfy this claim limitation.

If, however, Complainants' proposed construction of "code" were adopted such that "code" meant "a sequence of chips," then the evidence shows that the accused products would satisfy this claim limitation. The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. 802.11 – Analysis Under Alternate Construction

[ ] Respondents' products comprise structure [ ] as described above. The 802.11 Standard requires that each code is eight chips in length and there are 64 possible codes. Thus, M=64 and N=8 and M>N as required by the claim. *See* CX-1596C (Negus WS) at Q&A 188-97.

The code is chosen based on the grouped data bits. The data bits, which are grouped into di-bits, are used to select these chip sequences, or codes, to modulate signals. In particular, the grouped di-bits are mapped to "phases" denoted as "φ2, φ3, and φ4." CX-1596C (Negus WS) at Q&A 189. These phases are additively mapped to individual chips according to the rule: "φ2 is added to all odd code chips, φ3 is added to all odd pairs of code chips, and φ4 is added to all odd quads of code chips." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at § 18.4.6.5. Thus, the code selected to modulate the carrier signal is based on the grouped data bits. CX-1596C (Negus WS) at Q&A 189.

These codes are derived from a complementary code. There is a direct connection between the '958 patent and the 802.11 Standard in this regard. Equation 18-1 from the 802.11 Standard at §18.4.6.5 (CX-0116C (802.11 Standard, Jun. 2007)), which illustrates one possible

notation for representing "CCK code words," is identical to Equation 1 of the '182 patent, which is a parent patent to the '958 patent. *See* CX-0878 ('182 patent) at col. 2, lns. 21-22. Thus, the formula used to generate codes in CCK is part of the '958 patent.

Phase modulation involves mapping one or more data bits (or code bits known as "chips") to a particular phase angle of a transmitted carrier waveform. CX-1596C (Negus WS) at Q&A 193. The 11 Mb/s CCK mode of 802.11b is based on a particular form of phase modulation called "QPSK." In QPSK, one of 4 possible phase angles, each 90 degrees or $\pi/2$ radians apart, is selected as the mapping for a particular chip in the spreading sequence. *Id.* There are four possible phase angles ($0, \pi/2, \pi, 3\pi/2$) mapped to four different di-bits (00, 01, 10, and 11, respectively). *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at § 18.4.6.5.3.

Complainants' expert Dr. Negus described at least two typical structural styles for implementing [ ] One exemplary structure is a "phase modulator" that outputs a phase angle for each chip in a code. CX-1596C (Negus WS) at Q&A 196. In applying this phase modulator structure to in 11 Mb/s CCK modulation, the phases "$\varphi 2$, $\varphi 3$, and $\varphi 4$" described above are "binary coded" per the grouped di-bits to phase angles $\{0,\pi/2,\pi,3\pi/2\}$ (also expressed as multiples of $\pi/2$ and written as $\{0,1,2,3\}$). *Id.*; CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5.3.

These phase angles are used to modulate carrier waves. The 802.11 standard sets forth a specific set of rules to determine how these phase angles are used to modulate carrier waves. As described above, "$\varphi 2$ is added to all odd code chips, $\varphi 3$ is added to all odd pairs of code chips, and $\varphi 4$ is added to all odd quads of code chips." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5. In addition, the 802.11 Standard requires applying an additional rotation of π (or "+2" in $\pi/2$ incremental notation) to the 4th and 7th chips. *See e.g.*, CX-0116C (802.11

Standard, Jun. 2007) at §18.4.6.5.1; CX-1596C (Negus WS) at Q&A 198. When applying these rules, a code set of 64 unique sequences of chips is realized. *Id.*

Each sequence is of length 8 chips, and each chip is a phase angle comprising two code bits. *Id.* Each of the sequence values is chosen from the set of {0,1,2,3}. *Id.* Thus, M=64 codes and N=8 chips, or thus M>N and the number of codes in the set from which a selected code is chosen always exceeds the number of chips (or code bits) in each code of the set in the "CCK 11 Mb/s modulation" mode. *Id.*

Dr. Negus also described a second exemplary structure for implementing "CCK 11 Mb/s modulation" pursuant to the 802.11 Standard. In particular, Dr. Negus described a "dual-IQ channel binary modulator" that realizes the selection of binary-coded sequences of chips in separate "I" (or "in-phase") and "Q" (or "quadrature-phase") channels. *Id.* at Q&A 203.

In an exemplary dual-IQ channel binary modulator, two separate code set selection structures are used – one for the I-channel and another for the Q-channel. *Id.* Simply put, the four phase notation chips are mapped onto I and Q values using binary arithmetic. *Id.* Binary sequences (1s and 0s) are then then transmitted on separate I and Q channels. *Id.*

Although the dual-IQ channel binary modulator comprises effectively two modulators, either the I-channel or the Q-channel structure alone meets the limitation of this claim element. *Id.* Specifically, the set of "I-channel binary codes" for 11 Mb/s CCK modulation comprises 40 unique sequences of chips wherein each sequence is of length 8 chips and each chip comprises one code bit. *Id.* at Q&A 206. Thus, for the I-channel structure, this results in M=40 codes and N=8 chips, and thus M>N. *Id.*

In another variant of the dual-IQ channel binary modulator, the four phases of QPSK are then mapped to signed values of I and Q by the simple relationships "I=sin(phase)" and

"Q=cos(phase)." *Id.* This "dual-IQ channel signed binary modulator" also results in M=40 codes and N=8 chips for the I channel and M=64 and N=8 chips for the Q channel, with the result that M>N. *Id.*

ii. Ralink – Analysis Under Alternate Construction

[

] *Id.* Thus, Ralink's chips comprise a structure that is "a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N."

For example, [

] *Id.* at 61. [

] *Id.* [

] *Id.*; CX-0561C ([

]

[

] *See, e.g.*, JX-0032C ([.]

[

] *See* CX-1596C ([

] *Id.* [

] *Id.*

[

] *Id.*

[

] *Id.*; CX-0561C ([

CX-1596C (Negus WS) at Q&A 213.

Id.

[

] *Id.* at Q&A 215.]

iii. Realtek – Analysis Under Alternate Construction

Realtek's HDL code shows that [

] is present in Realtek's chips. *Id.* at Q&A 216. Thus, Realtek's chips also

comprise a structure [

]

Structure described by [

] *Id.*; CX-0298C (Realtek Source Code) at REA837ITC-SC-00000285; REA837ITC-SC-00002853,4,7-9. [

] CX-1596C (Negus WS) at 64-65, Q&A 218.

[

] CX-1596C (Negus WS) at Q&A 218.

[

] *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5; CX-0298C (Realtek Source Code) at REA837ITC-SC-000002854,57-59; CX-1596C (Negus WS) at Q&A 219.

Elements of [ ] structure within the Realtek HDL code [

]

Id. [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002857; REA837ITC-SC-00000285; REA837ITC-SC-00002853,4,7-9; CX-1596C (Negus WS) at Q&A 219.

[

]

CX-1596C (Negus WS) at Q&A 219. [

] *Id.* [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002857-59; CX-1596C (Negus WS) at Q&A 219.

iv. Funai – Analysis Under Alternate Construction

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Ralink's chips or Realtek's chips. CX-1596C (Negus WS) at Q&A 221.

d. wherein the code set is derived from a complementary code that provides autocorrelation sidelobes suitable for multipath environments.

A "complementary code" can be generated, *e.g.*, by composing sequences in the form "{A,B,A,B'}" where B' is the inverse of B. If A={1,1}, B={1,-1}, and B'={-1,1}, then ABAB'={1,1,1,-1,1,1,-1,1}. This is the code from which CCK codes are derived. *See* CX-0882 ('732 patent) at col. 5, lns. 1-21; CX-1596C (Negus WS) at Q&A 73.

As set forth above, the claim term "code" was construed to mean "a sequence of chips representing a real value." If, however, Complainant's proposed construction of "code" were adopted such that the term meant "a sequence of chips," then the evidence shows that the accused products would satisfy the claim limitation "wherein the code set is derived from a complementary code that provides autocorrelation sidelobes suitable for multipath environments."

The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. 802.11 – Analysis Under Alternate Construction

The 802.11 Standard explicitly states that CCK code words are "based on complementary codes." CX-0116C (802.11 Standard, Jun. 2007) at §§18.4.6.5. Codes are selected from a code set "derived from a complementary code" because the codes are formed by combining "generalized Hadamard transform encoding" and a "cover sequence" that is recognizable as {1,1,1,-1,1,1,-1,1}. *See* CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5; CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5.1; CX-1596C (Negus WS) at Q&A 232. This 802.11b cover sequence is a complementary code. CX-1596C (Negus WS) at Q&A 232.

The 802.11 standard states that the purpose of the "cover sequence" (or complementary code) is "to optimize the sequence correlation properties and minimize dc offsets in the codes." CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5.1. Since the "cross-correlation properties" of the code set are generally made acceptable by the "Hadamard transform encoding" process, the purpose of using the "cover sequence" (or complementary code) to "optimize the sequence correlation properties" is to provide low autocorrelation sidelobes suitable for multipath environments. CX-1596C (Negus WS) at Q&A 233.

The evidence shows that applying the cover sequence in fact results in low autocorrelation sidelobes. When the peak autocorrelation sidelobes of codes that meet the requirements of the 802.11 Standard at §18.4.6.5.3 are compared with and without application of the "cover sequence" (or complementary code) {1,1,1,-1,1,1,-1,1}, the peak autocorrelation sidelobes with the complementary code are lower than those without. CX-1596C (Negus WS) at Q&A 236. It is well known that for the complementary code {1,1,1,-1,1,1,-1,1} applied to the

"generalized Hadamard transform encoding," the resultant autocorrelation sidelobes range from about zero to less than one half of the code length when the shifted chips are time-aligned. *Id.* Per the explicit example given in the '958 patent, this range corresponds to a "small" "multipath performance degradation." *See* JX-0003 ('958 patent) at col. 4, lns. 1-6.

The drafters of the 802.11b standard chose the complementary code {1,1,1,-1,1,1,-1,1} as the "cover sequence" precisely because this provided low autocorrelation sidelobes due to its "sequence correlation properties" so as to create a standard suitable for "multipath environments." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §§5.2.4, 14.9, 19.7.2.1, 19.7.2.1.1, 19.7.2.1.3; CX-1596C (Negus WS) at Q&A 237.

ii. Ralink – Analysis Under Alternate Construction

[

] *See, e.g.*, CX-0561C (

] *See, e.g.*, CX-0561C ([

] *Id.*

[

] *See, e.g.*, CX-0561C ([

; CX-1596C .

] *Id.*

] CX-1596C .

iii. Realtek – Analysis Under Alternate Construction

[

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002857,8; CX-1596C (Negus WS) at Q&A 240. As with Ralink's chips, [

] CX-1596C (Negus WS) at Q&A 241. This complementary code provides for "autocorrelation sidelobes suitable for multipath environments" for at least the reasons described generally for such complementary codes in the 802.11 standard. *Id.*

iv. Funai – Analysis Under Alternate Construction

For those of Funai's products that interoperate with 802.11 standards devices and contain at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Ralink's chips or Realtek's chips and is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 242.

4. Claim 23

The record evidence shows that the accused products do not satisfy all limitations of claim 23.

a. The digital modulation system according to claim 22,

As shown above, the accused products do not satisfy all limitations of asserted claim 22 under the adopted claim constructions.

b. further comprising a mixer that modulates a carrier signal in accordance with the chosen code.

As set forth above, the claim term "code" was construed to mean "a sequence of chips representing a real value." If, however, Complainant's proposed construction of "code" were adopted such that the term meant "a sequence of chips," then the evidence shows that the accused products would satisfy the claim limitation "a mixer that modulates a carrier signal in accordance with the chosen code." The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. 802.11 – Analysis Under Alternate Construction

The 802.11 standard for 11 Mb/s CCK modulation requires that the selection of codes in response to grouped data bits "(d0 to d7; d0 first in time)" is at least a phase modulation using QPSK for a 2.4 GHz carrier signal. *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §§18.1, 18.4.6.5, 18.4.6.5.3; CX-1596C (Negus WS) at Q&A 249. As discussed above, the selected codes are used to modulate carrier signals to transmit information. Thus, this limitation is met under the 802.11 Standard.

ii. Ralink – Analysis Under Alternate Construction

[

] *See, e.g.*, CX-0562C

CX-0563C

; CX-0564C ; CX-0565C

CX-0566C ; CX-0567C ; CX-0568C

; CX-0569C ; CX-0570C ;

CX-1596C (

CX-0562C

CX-0563 ; CX-0566C

; CX-0567C ; CX-0568C

; CX-0569C ; CX-0570C ;

JX-0015C ; CX-1596C .]

iii. Realtek – Analysis Under Alternate Construction

Datasheets for certain of Realtek's chips describe [

] *See, e.g.*,

CX-0571C [at 8; CX-0572C [ ]) at 11;

CX-0573C [ ]) at 8; CX-0575C [ ]) at

8; CX-0576C [ ]) at 9; CX-0577C [ ]) at

9; CX-0578C [ ]) at 10; CX-0579C [ ]) at 16;

CX-0580C [ ]) at 57; CX-0581C [ ]) at 41;

CX-0582C [ ]) at 37; CX-0583C [ ]) at 38;

CX-0584C [ ]) at 9-10; CX-1596C (Negus WS) at Q&A 252. An [

] indicates that the [ ] comprises a [ ] to perform such [

] *See, e.g.*, CX-0572C [ ]) at 180-194; CX-1596C (Negus WS) at Q&A 252.

iv. Funai – Analysis Under Alternate Construction

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Ralink's chips or Realtek's chips and is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 254. Even if a Funai product comprised an older Realtek chip that may not meet the recited limitation due to a lack of RF circuitry, such RF circuitry would still necessarily be present in Funai's products even if supplied by some other non-accused Realtek chip or product(s) from another chip supplier. *Id.*

5. Claim 24

The record evidence shows that the accused products do not satisfy all limitations of claim 24.

a. The digital modulation system according to claim 23,

As shown above, the accused products do not satisfy all limitations of asserted claim 23 under the adopted claim constructions.

b. wherein the mixer modulates the phase of at least one carrier signal in accordance with the selected code.

As set forth above, the claim term "code" was construed to mean "a sequence of chips representing a real value." If, however, Complainant's proposed construction of "code" were adopted such that the term meant "a sequence of chips," then the evidence shows that the accused products would satisfy the claim limitation "the mixer modulates the phase of at least one carrier signal in accordance with the selected code." The accused products satisfy this claim limitation for the same reasons discussed above with respect to claim 23. In particular, the mixer

"that modulates a carrier signal in accordance with the chosen code" does so by modulating the phase of the carrier signal.

6. Claim 25

The record evidence shows that the accused products do not satisfy all limitations of claim 25.

a. The digital modulation system according to claim 24,

As shown above, the accused products do not satisfy all limitations of asserted claim 24 under the adopted claim constructions.

b. wherein the phase of the at least one carrier signal is QPSK modulated in accordance with the selected code.

As set forth above, the claim term "code" was construed to mean "a sequence of chips representing a real value." If, however, Complainant's proposed construction of "code" were adopted such that the term meant "a sequence of chips," then the evidence shows that the accused products would satisfy the claim limitation "the phase of the at least one carrier signal is QPSK modulated in accordance with the selected code." The accused products satisfy this claim limitation for the same reasons discussed above with respect to claim 23. In particular, CCK modulation is a form of QPSK modulation.

7. Claim 26

The record evidence shows that the accused products do not satisfy all limitations of claim 26.

a. The digital modulation system according to claim 22,

As shown above, the accused products do not satisfy all limitations of asserted claim 22 under the adopted claim constructions.

b. further comprising a scrambler for scrambling the group of data bits.

The evidence shows that the accused products satisfy the additional claim 26 limitation of "a scrambler for scrambling the group of data bits."

i. 802.11

[ ] Respondents' products include [ ] *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §18.2.4; CX-1596C (Negus WS) at Q&A 257. Thus, [ ] *Id.*

ii. Ralink

[JX- , CX-0561C ; CX-1596C .]

iii. Realtek

Datasheets confirm that the features claimed in dependent claim 26 [ ] *See, e.g.*, CX-0579C [ ]) at 16, 36; CX-0580C [ ] at 11; CX-0581C [ ]) at 10; CX-0582C [ ]) at 9; CX-0583C [ ]) at 9; CX-1596C (Negus WS) at Q&A 259. In addition, HDL code for Realtek's chips in the module [ ] shows that [ ] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002848-50; REA837ITC-SC-00002844,8,9; CX-1596C (Negus WS) at Q&A 259.

iv. Funai

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 260.

8. Claim 29

a. A digital modulation system for modulating data bits, comprising: a serial-to-parallel converter that groups the data bits, and a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N, and wherein the code set is derived from a complementary code,

As set forth above, the claim term "code" was construed to mean "a sequence of chips representing a real value." If, however, Complainant's proposed construction of "code" were adopted such that the term meant "a sequence of chips," then the evidence shows that the accused products would satisfy each of these claim limitations for the reasons discussed above with respect to claim 22.

b. wherein the complementary code is defined by the sequence ABAB′, such that A is a sequence of elements and B is a sequence of elements and wherein B′ is derived by inverting all elements in the sequence B.

As set forth above, the claim term "code" was construed to mean "a sequence of chips representing a real value." If, however, Complainant's proposed construction of "code" were adopted such that the term meant "a sequence of chips," then the evidence shows that the accused products would satisfy the claim limitation "the complementary code is defined by the sequence ABAB′, such that A is a sequence of elements and B is a sequence of elements and wherein B′ is derived by inverting all elements in the sequence B." The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. 802.11 – Analysis Under Alternate Construction

As discussed above, the codes in CCK modulation are derived from the sequence {1,1,1,-1,1,1,-1,1}, which is a sequence in the form ABAB'. [

] *See, e.g.*, CX-0561C (Ralink Source Code) at 837RALINK_SC0000007-8; CX-1596C (Negus WS) at Q&A 267; CX-0561C (Ralink Source Code) at 837RALINK_SC0000007,8; CX-1596C (Negus WS) at Q&A 268. [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002857-8; CX-1596C (Negus WS) at Q&A 269. [

] For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 270.

9. Claim 32

a. A digital modulation system for modulating a group of data bits, comprising: a scrambler for scrambling the group of data bits, and a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M >N, and wherein the code set is derived from a complementary code that provides autocorrelation sidelobes suitable for multipath environments.

Independent claim 32 recites all elements of claim 22 except "a serial-to-parallel converter that groups the data bits," and has no additional limitations. Under the claim constructions adopted above, Respondents' accused products would not satisfy all limitations of claim 32 for the reasons discussed above with respect to claim 22. If, however, Complainants' proposed construction of "code" were adopted, the evidence would show that the accused

products satisfy all elements of claim 32, again for the same reasons discussed above with respect to claim 22.

10. Claim 35

a. A digital modulation system for modulating a group of data bits, comprising: a scrambler for scrambling the group of data bits, and a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N, and wherein the code set is derived from a complementary code, wherein the complementary code is defined by the sequence ABAB′, such that A is a sequence of elements and B is a sequence of elements and wherein B′ is derived by inverting all elements in the sequence B.

Independent claim 35 recites all elements of claim 29 except "a serial-to-parallel converter that groups the data bits," and has no additional limitations. Under the claim constructions adopted above, Respondents' accused products would not satisfy all limitations of claim 35 for the reasons discussed above with respect to claim 29. If, however, Complainants' proposed construction of "code" were adopted, the evidence would show that the accused products satisfy all elements of claim 35, again for the same reasons discussed above with respect to claim 29.

11. Funai / [ ] Products

In a separate section of their post-hearing brief, Complainants argue that Funai products that contain chips sourced from [ ] infringe the asserted claims of the '958 patent by virtue of their implementation of the 802.11 CCK functionality. *See* Compls. Br. at 595-96. Complainants provide the following table that purports to list the Funai products accused of infringing the '958 patent that contain an [ ] chip, as well as relevant documentation showing 802.11 compatibility:

[			
		]	]

Compls. Br. at 595-96.

With respect to these products, Complainants argue:

> The datasheet for the [ ] clearly states that it "[.]" *See*, CX-0994C at 1, 34. All products that claim to have an 11 Mb/s CCK transmit capability that are in compliance or interoperable with any of the IEEE 802.11b, 802.11g, or 802.11n standards are, at minimum, more likely than not, and indeed highly likely, to infringe at least Claims 32 and 35 of the '958 Patent. CX-1643C (Negus Rebuttal Witness Statement) at 4, Q&A 11; 8, Q&A 42. Indeed, HDL code for numerous such products from Ralink and Realtek in this case demonstrates that the limitations of the asserted claims of the '958 Patent were met by all such products that claimed to have an 11 Mb/s CCK transmit capability in compliance or interoperable with any of the IEEE 802.11b, 802.11g, or 802.11n standards. *See* Section V.B, *supra*.
>
> Accordingly, Funai Products that incorporate the [ ] Chips are highly likely to infringe Claims 32 and 35 of the '958 Patent.

> CX-1643C (Negus Rebuttal Witness Statement) at 4, Q&A 11; 8, Q&A 42.

Compls. Br. at 596.

Complainants have not adduced evidence to show that the Funai/[ ] products in question infringe the '958 patent. As an initial matter, the administrative law judge denied Complainant's motion to supplement the expert report of Dr. Negus to include infringement opinions related to the Funai/[ ] products. Order No. 84 (Mar. 28, 2013). The administrative law judge also granted Respondents' motion to strike portions of Dr. Negus' witness statement that opined on the alleged infringement of the Funai/[ ] products. Order No. 85, at 4 (Mar. 29, 2013). Accordingly, Complainants' infringement arguments are not supported by expert testimony.

Complainants instead generally allege, without evidentiary support, that these products are "more likely than not" and "highly likely" to infringe the asserted claims. *See* Compls. Br. at 596. Such a statement is not enough to prove that the Funai/[ ] products practice all elements of the asserted '958 claims. Therefore, it is determined that Complainants have not shown that the Funai/[ ] products infringe the asserted claims of the '958 patent.

D. Validity

1. Priority Date

The parties dispute whether or not the asserted claims of the '958 patent are entitled to the July 30, 1996 priority date of U.S. Patent No. 5,862,182 ("the '182 patent"), which is an ancestor to the '958 patent and matured from Application No. 08/688/574 ("the '574 application"). *See* Compls. Br. at 30-33; Resps. Br. at 51-54. The record evidence shows that the amendment to the '958 patent adding the claim of priority to the '574 application was procedurally proper under the PTO rules in effect at the time. The '958 patent was filed on April

22, 1998. JX-0003. On January 28, 2002, a Supplemental Amendment was filed with the PTO that included a specification amendment adding a priority claim directly after the invention title. JX-0005 ('958 file history) at 124. The priority claim recites that the '958 patent application is a continuation-in-part ("CIP") of the Application No. 09/057,310 ("the '310 application"), and a further CIP of the '574 application. *Id.* Richard van Nee is listed as an inventor on all of these applications.

The Manual of Patent Examining Procedure ("MPEP") in place at the time provided that such a priority claim to an earlier application was proper if made "before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application." MPEP, Eighth Ed., § 201.08. The pendency requirement of the MPEP is based solely on the application filing date, which was before the date on which the first application was issued as a patent. Further, the incorporation of the prior specification did not add "new matter" to the application because the claims of the '958 patent were supported by the application prior to amendment, therefore precluding a finding of "new matter."

Moreover, the asserted claims themselves are supported by the specification of the '182 patent. Respondents assert that the following claim terms are not supported by the '182 patent: (1) serial-to-parallel converter, (2) M>N, (3) autocorrelation sidelobes, (4) QPSK, and (5) scrambler. *See* Resps. Br. at 52-54. The record evidence shows otherwise.

a. Serial-to-parallel converter

The concept of "a serial-to-parallel converter that groups the data bits" is disclosed in the '182 patent. The '182 specification describes "a conventional digital signal processor" that "partitions the data stream as it is received into successive groups of twelve bits." CX-0878

('182 patent) at col. 2, lns. 40-55. A person of ordinary skill in the art would have understood this to disclose using a serial-to-parallel converter to group data bits. CX-1641C (Katti RWS) at Q&A 130. The '182 patent further discloses that after the encoder circuit encodes the groups of bits into phases, "it then supplies those values for those phases to IFFT processor 40, which may be, for example, a conventional digital signal processor (DSP)." CX-0878 ('182 patent) at col. 3, lns. 35-38. A person of ordinary skill in the art would have understood "DSP" to include a serial-to-parallel converter. CX-1641C (Katti RWS) at Q&A 131.

b. M>N

The '182 patent discloses an extended code set in which the number of codes (M) is greater than the length of each code (N), that is M>N. The '958 patent claims non-orthogonal code sets in which the number of codes in the code set is larger than the length of each code in chips. Specifically, column 4, lines 59-65 of JX-0003 ('958 patent) states that "M represents an extended number of codes of length N when compared to conventional M-ary keying systems. In conventional M-ary keying systems, the number of possible codes M is not more than the code length N in chips. In the present invention, the number M of codes is always larger than the code length N."

An "orthogonal" code set in which the number of codes equals the code length can be expressed as a square matrix in which the number of rows is equal to the number of columns. CX-1641C (Katti RWS) at Q&A 134. Each row represents a code and each column entry represents a chip. *Id.* Thus, in a square matrix M=N. An extended code set in which M>N can thus be expressed as a nonsquare matrix. *Id.* Matrix A in column 4 of the '182 patent explicitly discloses a set of codes in which the number of codewords is greater than the code length. CX-0878 ('182 patent) at col. 4, lns. 49-58. There are eight rows and four columns used to

encode phases. CX-1641C (Katti RWS) at Q&A 135. A person of ordinary skill in the art would understand that the '182 patent discloses the claim element M>N. *Id.* at Q&A 136.

c. Autocorrelation sidelobes suitable for multipath environments

The '182 patent also discloses "autocorrelation sidelobes suitable for multipath environments." The '182 patent discloses the use of the following equation:

$$c=\{e^{j(\phi 1+\phi 2+\phi 3+\phi 4)},e^{j(\phi 1+\phi 3+\phi 4)},e^{j(\phi 1+\phi 2+\phi 4)},-e^{j(\phi 1+\phi 4)},e^{(\phi 1+\phi 2+\phi 3)},e^{j(\phi 1+\phi 3)},-e^{(\phi 1+\phi 2)},e^{j\phi i}\} \quad (1)$$

CX-0878 ('182 patent) at col. 2, lns. 21-22. This is identical to Equation 18-1 from the 802.11b standard, which is used to generate codes in CCK modulation that have autocorrelation sidelobes suitable for multipath environments. *See* CX-0116C (802.11 Standard, Jun. 2007) at §18.4.6.5.

The '182 patent also discloses the series {111-111-11} as a kernel for generating codes of length 8. CX-0878 ('182 patent) at col. 1, lns. 62-64. The use of this exact "cover sequence" in CCK modulation provides low autocorrelation sidelobes. CX-1596C (Negus WS) at Q&A 233. Thus, a person of ordinary skill in the art would understand the '182 patent to disclose low autocorrelation sidelobes. CX-1641C (Katti RWS) at Q&A 137-138.

A person of ordinary skill in the art likewise would have understood the '182 patent to disclose a modulation system suitable for multipath environments. The problems of operating wireless local area networks indoors (*i.e.*, in multipath environments) was well understood at the time of the filing of the application for the '182 patent, and a person of ordinary skill in the art would therefore have understood low autocorrelation sidelobes to be suitable for multipath environments. CX-1641C (Katti RWS) at Q&A 139. Further, the '182 patent teaches how to design complementary codes with low autocorrelation sidelobes for OFDM. *Id.* at Q&A 140. A

person of ordinary skill in the art would have known that OFDM is an especially attractive modulation system for tackling multipath, and therefore would have been able to apply the teachings of the '182 patent (specifically its code design) to the problem of communication in multipath environments. *Id.*

d. QPSK

QPSK is a type of Phase Shift Keying. The '182 patent explicitly discusses two variants of Phase Shift Keying, 8-PSK and BPSK. CX-0878 ('182 patent) at col. 7, lns. 39-43. As QPSK is just another variant of Phase Shift Keying such as BPSK and 8-PSK, a person of ordinary skill in the art would have understood the '182 patent to disclose phase shift keying generally, which would include QPSK. CX-1641C (Katti RWS) at Q&A 142.

e. Scrambler

The '182 patent specification does not explicitly disclose a scrambler, but a person of ordinary skill in the art would have understood the '182 patent to disclose an invention in which a data scrambler could be incorporated. *Id.* at Q&A 143. This is supported by the deposition testimony of Respondents' expert, Dr. Heegard, who testified that a scrambler is "pretty much inherit in any kind of digital communication systems." *Id.* at Q&A 144.

2. The Prasad Reference

K.V. Prasad & M. Darnell, "Data Transmission Using Complementary Sequence Sets" (1991) ("Prasad") (RX-0590 (Prasad - Data Transmission)) was published in Fifth International Conference on HF Radio Systems and Techniques, 1991, and was publicly available no later than March 3, 1992. RX-1352 (Ellett Declaration) ¶ 16. Accordingly, Prasad is prior art to the asserted claims of the '958 patent pursuant to 35 U.S.C. § 102(b).

a. Anticipation Analysis

Respondents argue that Prasad anticipates claims 22, 23, and 24 of the '958 patent. Resps. Br. at 105-110. Respondents' position is not supported by the record evidence, however.

Prasad is directed to a system for transmission over a multi-carrier system in which the available bandwidth is divided into several carriers and encodes data across all carriers simultaneously. CX-1641C (Katti RWS) at Q&A 169-170. This is different from the single-carrier system of the '958 patent. *Id.* In a multi-carrier system, one has to design encoding algorithms to map incoming data bits into codewords that are simultaneously modulated over multiple carriers. *Id.* at Q&A 172. The chips in a codeword are therefore spread over multiple carriers and frequencies. *Id.* Prasad maps a group of data bits to a single complementary sequence of chips (a code) that is then modulated in parallel on to all the sub-carriers. *Id.* at Q&A 173. The problem that Prasad addresses is how to map the group of data bits to the complementary sequence that is then modulated on to the sub-carriers and sent over the air. *Id.* In a single carrier system, the codeword is modulated over a single carrier frequency. *Id.* Hence, Prasad applies to a different type of communication system compared to the '958 patent. *Id.*

Prasad fails to teach deriving a code set in which the number of codes is greater than the code length. The solution in Prasad is to map each group of data bits to a codeword (also called a complementary set in the article), where each codeword consists of M sequences of length N that is an integer multiple of 2. *Id.* at Q&A 174. There are M such codewords, and the number of sequences in a codeword is *equal* to the number of codewords. *Id.*

Prasad also teaches that 2M codewords can be generated by inverting the sequences in each codeword. *Id.* An example of the code set in Prasad is shown in CDX-0301. In this example, there are 4 codewords (M=4) which are complementary to each other, and each

codeword has 16 chips (N=16), where each column of 4 chips would be mapped to a subcarrier and this code would support 4 subcarriers. *Id.* at Q&A 176. The hearing testimony of Respondents' expert Dr. Heegard was consistent with this explanation. Heegard Tr. 1125. To put it into the terminology of the '958 patent, the number of chips in each codeword is MxN, and there are at most 2M such codewords. The minimum value for N is 2, and in almost all the examples in the article N takes values from 4 to 32 bits. Thus, the number of chips in a codeword is typically 4M or 8M. CX-1641C (Katti RWS) at Q&A 176.

In Prasad, when the selection of the code set is carried out in accordance with the grouping of the data (or "in response to the group of the data bits" as required by the claim language), the length (N) of each of the M code sets is a multiple integer of 2M. *Id.* at Q&A 181. Further, the code set in Prasad cannot be "doubled" by inverting each code, as the use of such inversions to "double" a code set was disclaimed during the prosecution of the '574 application. *Id.*; JX-0004 ('958 file history) at 44, May 10, 2000 Office Action, at 4-8. Hence, in contrast to the asserted claims of the '958 patent requiring that M>N, in Prasad M<N or, at most, M=N. CX-1641C (Katti RWS) at Q&A 181. Accordingly, Prasad fails to disclose the claim element "a modulator that chooses a code having N chips in response to the group of data bits, the code being a member of a code set that includes M codes, wherein M>N," as required by all asserted claims. *Id.* It is therefore determined that Prasad does not anticipate any asserted claim of the '958 patent.

b. Obviousness Analysis

Respondents assert that Prasad renders obvious claims 25, 26, 29, 32 and 35 of the '958 patent. Resps. Br. at 110-112. Inasmuch as Prasad fails to disclose M>N, Respondents have not adduced clear and convincing evidence that Prasad renders obvious any of these claims.

Further, Prasad does not render obvious the ABAB' claim limitation of claims 29 and 35. *See* Resps. Br. at 111-12. While such sequences existed in the art, Respondents have pointed to nothing in the prior art in which such a sequence is used for modulation. Respondents' expert Dr. Heegard described the ABAB' limitation in the '958 patent as "silly" and "a travesty," and said that there would be no reason to use the ABAB' sequence. *See* Heegard Tr. 1144-1145. In light of Dr. Heegard's assertion that there would be no reason to use the ABAB' sequence, Respondents' argument that use of such a sequence was obvious from the prior art is not persuasive.

3. The Harris Proposal

The Harris Proposal (RX-0529 (Presentation – Harris High Rate Daa Modulation); RX-1351 (Harris Proposal)) was a prior art reference submitted in the '958 applicant's first Information Disclosure Statement. The Harris Proposal was presented to the IEEE 802.11 Working Group and made publicly available at least as early as November 10, 1997. RX-0001 (Andren WS) at Q&A 25-26. Inasmuch as it is determined that the '958 patent is entitled to a 1996 priority date, Respondents have not shown that the Harris Proposal is prior art to the asserted '958 claims.

a. Anticipation Analysis

The GR12 Filing indicates that this Initial Determination should include findings on whether the Harris Proposal anticipates claims 22, 23, 25, 26, 29, 32, and 35 of the '958 patent. *See* GR12 Filing at 12. Respondents, however, have not briefed the issue of anticipation by the Harris Proposal. *See* Resps. Br. at 96-121. Accordingly, the administrative law judge declines to issue any findings with respect to anticipation of the '958 patent by the Harris Proposal.

b. Obviousness Analysis

The GR12 Filing also indicates that this Initial Determination should include findings on whether the Harris Proposal renders obvious claim 26 of the '958 patent, but Respondents did not brief this issue. *See* GR12 Filing at 12; Resps. Br. at 96-121. Accordingly, the administrative law judge declines to issue any findings with respect to whether the Harris Proposal renders obvious the '958 patent.

4. Combinations of Prior Art

a. The Harris Proposal and van Nee 1996

Respondents allege that the Harris Proposal, in combination with a 1996 article by named inventor Richard van Nee, renders obvious all asserted claims of the '958 patent. *See* Resps. Br. at 113-16. "OFDM Codes for Peak-to-Average Power Reduction and Error Correction" by Richard van Nee ("van Nee 1996") (RX-0614 (van Nee – OFDM Codes)) was published in *Global Telecommunications Conference*, 1996, and was publicly available no later than December 6, 1996. RX-1352 (Ellett Declaration) ¶ 19. Inasmuch as it is determined that the '958 patent is entitled to a July 30, 1996 priority date, Respondents have not shown that van Nee 1996 is prior art to the asserted '958 claims. Accordingly, it is determined that the Harris Proposal in combination with van Nee 1996 does not render obvious the asserted '958 claims.

b. Proakis in Combination with Weathers

John. G. Proakis, Digital Communications (3d ed.) ("Proakis") (RX-1349 (Proakis – Digital Communications)) is the 1995 edition of a textbook for students and practicing engineers involved in the design of digital communications. *See* RX-0006C (Heegard WS) at Q&A 438-439. Proakis is prior art to the asserted claims pursuant to 35 U.S.C. § 102(b).

U.S. Patent No. 4,513,288 ("Weathers") to Glenn D. Weathers and Edward M. Holliday was assigned to the United States government as represented by the Secretary of the Army. RX-0099 (Weathers '288). The title of the patent is "Group-Complementary Code Sets for Implementing Pulse-Compression Processing with Optimum Aperiodic Autocorrelation and Optimum Cross-Correlation Properties." *Id.* The patent issued on April 23, 1985, and is prior art to the asserted '958 claims pursuant to 35 U.S.C. § 102(b).

The combination of these two references does not show by clear and convincing evidence that the asserted '958 claims are rendered obvious. Proakis discloses certain basic concepts applicable to digital signal modulation, and does not disclose autocorrelation sidelobes suitable for multipath. CX-1641C (Katti RWS) at Q&A 231. Weathers teaches a pulse compression radar system, and only discloses a code set with a single "group complementary code." *Id.* at Q&A 241; RX-0099 (Weathers '288) at col. 3, lns. 13-17. In Weathers M=1, and therefore M<N for a group complementary code of length N>1. While Weathers does discuss low autocorrelation sidelobes, Weathers fails to address the specific multipath issues present in the WLAN system of the '958 Patent. CX-1641C (Katti RWS) at Q&A 243. Weathers is not applicable to the problem solved by the '958 patent, even if some of the same terminology is used. Inasmuch as Weathers fails to disclose M>N, and neither Proakis nor Weathers discloses low autocorrelation sidelobes suitable for multipath environments, the combination of these two references do not render obvious any asserted claim of the '958 patent.

c. Other Prior Art Combinations

The GR12 Filing indicates that this Initial Determination should include findings on whether additional prior art combinations render obvious the asserted claims of the '958 patent,

but Respondents did not brief these combinations.[43] *See* GR12 Filing at 12-14; Resps. Br. at 96-121. Accordingly, the administrative law judge declines to issue any findings with respect to whether or not these prior art combinations render obvious the '958 asserted claims.

5. Secondary Considerations

Complainants argue that secondary considerations demonstrate that the asserted claims of the '958 patent are not obvious. *See* Compls. Br. at 417-20. Specifically, Complainaints argue that evidence of commercial success, long felt but unmet need, failure of others, copying, and praise for the claimed invention weighs against a finding of obviousness. *Id.* The evidence cited by Complainants, however, consists primarily of expert testimony from Dr. Negus,[44] and fails to establish the requisite nexus between the alleged secondary considerations and the '958 patent. Moreover, inasmuch as Respondents have not shown by clear and convincing evidence that the asserted claims are anticipated or rendered obvious in light of the cited prior art references, the secondary considerations play only a minor role in the validity analysis of the '958 patent.[45]

6. Indefiniteness

Respondents argue that each of the asserted independent '958 claims, *i.e.*, claims 22, 29, 32, and 35 are indefinite due to the limitation "wherein the code set is derived from a complementary code." *See* Resps. Br. at 97-101 (citing RX-0006C (Heegard WS) at Q&A

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[43] These combinations include: (1) Prasad in combination with Proakis and the Harris Proposal, (2) Proakis in combination with Kemp, (3) Prasad in combination with the 802.11-1997 reference, (4) Proakis in combination with Kemp and the 801.11-1997 reference, and (5) Proakis in combination with Weathers and the 802.11-1997 reference. GR12 Filing at 12-14.

[44] [

]

Tr. 237, 242.

[45] In any event, the discussion of the validity of the '958 patent is provided in the alternative, inasmuch as it has been determined that the asserted claims of the '958 patent are not infringed.

709-713). Respondents also argue that claims 22 and 32 of the '958 patent are indefinite due to the limitation of a code derived from a complementary code with "autocorrelation sidelobes suitable for multipath environments." *See* Resps. Br. at 101-04 (citing RX-0006C (Heegard WS) at Q&A 714-717). Based on the record evidence, it is determined that Respondents have not shown by clear and convincing evidence that the identified claims are invalid for indefiniteness.

Turning first to the claim limitation "wherein the code set is derived from a complementary code," a person of ordinary skill in the art would understand the term to mean that a complementary code is used to determine the code set. CX-1641C (Katti RWS) at Q&A 350. Inasmuch as the '958 patent provides examples of complementary codes, the term is well-defined by the patent and would be understood by one of ordinary skill in the art. *Id.*

Moreover, the asserted claims do not require that the modulation system itself derives the code set. *Id.* at Q&A 351. Rather, the claims require that the code set itself "is derived" from a complementary code. *Id.* This is a property of the code set that has nothing to do with any action taken by the modulation system. *Id.* So long as the modulation system is configured to modulate signals using a code set derived from a complementary code, the claim element is satisfied. *Id.*

Also, an "end user" need not know how a code set was derived, and a person of ordinary skill in the art would know, *e.g.*, whether the code set was derived from a complementary code set, such as by using Equation 1 of the parent '182 patent. *Id.* Inasmuch as the '182 patent specification and the '958 patent specification each provide specific examples of how a code set may be derived from a complementary code, the asserted claims are not indefinite with respect to this claim limitation.

As for the claim limitation "autocorrelation sidelobes suitable for multipath environments," the '958 patent specification includes disclosure sufficient to support this claim term. A person of ordinary skill in the art would have understood what size autocorrelation sidelobes would have been suitable for multipath environment. CX-1641C (Katti RWS) at Q&A 356. At the very least, the '958 patent specification provides a specific example of suitable autocorrelation sidelobes, namely "half a code length." JX-0003 ('958 patent) at col. 4, lns. 1-6. This specific example demonstrates that the claim limitation at issue is not indefinite.

Further, the term "suitable for multipath environment" modifies "autocorrelation sidelobes," and not the code set. CX-1641C (Katti RWS) at Q&A 357. Thus, the fact that there may be other factors that affect whether a particular code word or code set is "suitable for multipath environments" is irrelevant to the question of whether the autocorrelation sidelobes are suitable for multipath environments. *Id.*

7. Written Description

Respondents argue that, in the event that Complainants' proposed construction of "code" were adopted such that the term were construed to encompass both real and complex codes, the asserted claims of the '958 patent would then be invalid for lack of written description. *See* Resps. Br. at 96-97. Respondent's argument has merit.

The only codes described in the '958 patent are real codes, and the patent does not contain a description sufficient to support a broad claim over the entire "genus" of codes, both real and complex. As discussed above, not only is every code disclosed in the '958 specification a real code, but each described embodiment of a digital modulation system in fact requires that the codes selected are real. Accordingly, if the term "code" were construed to include the entire genus of codes, the asserted claims would be invalid for lack of written description.

Nevertheless, inasmuch as Complainants' proposed construction of "code" was not adopted in this investigation, the question of whether the asserted '958 claims are invalid for lack of written description is moot.

VIII. The '867 Patent

A. The Asserted Claims and Accused Products

Asserted U.S. Patent No. 6,707,867 ("the '867 patent") is titled, "Wireless Local Area Network Apparatus." JX-0005 ('867 patent). The '867 patent issued on March 16, 2004, and the named inventors are Wilhelmus J. M. Diepstraten, Hendrik van Bokhorst, and Hans van Driest. *Id.* The '867 patent relates generally to "[a] wireless local area network apparatus includ[ing] a transmitter and a receiver in which operation of the receiver is accurately synchronized with periodic signal from the transmitter." *Id.* at Abstract.

LSI asserts independent claims 20, 26, 34, 47, and 49, and dependent claims 23, 24, 27-33, 35, 37-40, 50-56, and 58-61 against Funai and Realtek. The relevant claims are as follows:

> **20.** A receiver, comprising:
>
> a receiver counter that counts up to n counts, and
>
> a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer, and wherein the timestamp accounts for delays due to a busy signal on a medium access protocol.
>
> **23.** The receiver of claim 20, wherein the transmission signal further includes a header field, which is transmitted before the timestamp field and the traffic pending field.
>
> **24.** The receiver of claim 23, wherein the header field includes type data indicating a type of the transmission signal.

26. A receiver, comprising:

a receiver counter that counts up to n counts,

a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer, and

circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer, wherein the receiver counter commences a synchronizing count sequence beginning at the adjusted value.

27. The receiver of claim 26, further comprising:

circuitry for commencing the synchronizing count sequence after the transmission signal is completely received.

28. The receiver of claim 27, further comprising circuitry for commencing the synchronizing count sequence after a CRC data in the received transmission signal is checked.

29. The receiver of claim 26, further comprising an adder for adding a compensation factor to the value at which the count sequence begins.

30. The receiver of claim 29, wherein the compensation factor compensates for propagation delay at the receiver.

31. The receiver of claim 29, wherein the compensation factor allows for time taken to process the transmission signal at the receiver.

32. The receiver of claim 26, wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal.

33. The receiver of claim 26, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol.

34. A receiver, comprising:

a receiver counter that counts up to n counts, and

a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a traffic pending field and a timestamp field the traffic pending field including data indicating stations for which the transmitter has data buffered, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer at the time of transmission of the transmission signal.

35. The receiver of claim 34, wherein the transmission signal further includes a timer interval field, and-the timer interval field includes timer interval data indicating an interval between periodic transmissions of transmission signals including traffic pending field.

37. The receiver of claim 35, wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal.

38. The receiver of claim 35, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol.

39. The receiver of claim 34, wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal.

40. The receiver of claim 34, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol.

47. A receiver comprising:

a receiver counter that counts up to n counts, and

a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer, and wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal.

49. A wireless local area network receiver, comprising:

a receiver timer that counts up to n counts, and

a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a timestamp for

synchronizing the receiver timer with a transmitter timer that counts up to n counts, the timestamp being a value m which accounts for a delay between a start of a process to transmit the transmission signal from the transmitter and an actual time of transmitting the transmission signal,

wherein the receiver retrieves the timestamp and the receiver timer commences a count sequence based on the value m as to synchronize the receiver timer with the transmitter timer.

50. The receiver of claim 49, wherein the timestamp accounts for delays in a modem of the transmitter.

51. The receiver of claim 49, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol.

52. The receiver of claim 49, wherein the receiver timer commences a synchronizing count sequence beginning at a value based on the timestamp.

53. The receiver of claim 52, further comprising circuitry for adjusting the value at which the count sequence begins.

54. The receiver of claim 53, further comprising an adder for adding a compensation factor to the value at which the count sequence begins.

55. The receiver of claim 54, wherein the compensation factor compensates for propagation delay at the receiver.

56. The receiver of claim 54, wherein the compensation factor allows for time taken to process the transmission signal at the receiver.

58. The receiver of claim 49, further comprising circuitry for commencing the synchronizing count sequence after the transmission signal is completely received.

59. The receiver of claim 58, further comprising circuitry for commencing the synchronizing count sequence after a CRC data in the received transmission signal is checked.

60. The receiver of claim 49, wherein the transmission signal further includes a traffic pending field that indicates stations for which the transmitter has data buffered.

> **61.** The receiver of claim 60, wherein the transmission signal further includes a timer interval field, and the timer interval field includes timer interval data indicating an interval between periodic transmissions of transmission signals including traffic pending fields.

JX-0005 at col. 9, lns. 57-67; col. 10, lns. 9-14; col. 10, lns. 23-67; col. 11, lns. 1-8; col. 11, lns. 12-25; col. 12, lns. 18-29; col. 12, lns. 38-67; col. 13, lns. 1-3; col. 13, lns. 8-21.

Complainants accused the following products of infringing the '867 Patent: (1) Realtek's products that are compliant or compatible with the applicable 802.11 standards described for timing synchronization; and (2) Funai's products that (a) are compatible with the applicable 802.11 standards described for timing synchronization; (b) contain at least one of Realtek's products; or (c) contain at least one of Ralink's products that are compatible with the applicable 802.11 standards described for timing synchronization. Compls. Br. at 45-46.[46]

Complainants provide the following table purporting to summarize Funai's products accused of infringing the '958 Patent and the '867 Patent, along with the WiFi chip supplier for each product and documentation showing 802.11 compatibility:

[			
			]

[46] Complainants also accuse of infringement certain Funai products that contain chips from [ ]. These products will be addressed separately in the section addressing Complainants' infringement arguments.

[			
			]

Compls. Br. at 46-47.

Complainants provide the following table purporting to summarize Realtek's products accused of infringing the '958 Patent and the '867 Patent, along with the documentation showing 802.11 compatibility:

[		
		]

[		
		]

Compls. Br. at 47-49.

Complainants provide the following table purporting to list the Ralink products at issue with respect to the '958 Patent and the '867 Patent, along with the documentation showing 802.11 compatibility:

[		
		]

Compls. Br. at 50.

B. Claim Construction

1. Level of Ordinary Skill

A person of ordinary skill in the art relevant to the '867 patent at the time of the invention would have at least a bachelor's degree in electrical engineering, computer science, or a related field, and at least one year of experience and knowledge in communication networks or a related field. RX-0006C (Heegard WS) at Q&A 718-21.[47]

[47] Complainants propose that a person of ordinary skill in the art at the time of the invention of the '867 patent would be someone with a BSEE or equivalent and at least two years of experience in developing or implementing wireless communications protocols at the MAC layer. Compls. Br. at 42 (citing CX-1596C (Negus WS) at Q&A 133). The parties have not identified any way in which differences in their proposed definitions of the level of ordinary skill in the art affect issues in this investigation. *See* Resps. Br. at 137.

2. "periodically receiving [a transmission signal from a transmitter]"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"periodically receiving [a transmission signal from a transmitter]"	No construction necessary. Alternatively, "receiving transmission signals separated by time intervals"	"receiving at regular intervals"

The claim term "periodically receiving [a transmission signal from a transmitter]" appears in asserted claims 20, 26, 34, 47, and 49 of the '867 patent. Complainants argue that this term needs no construction, but argue that it should be construed to mean "receiving transmission signals separated by time intervals" in the event it is decided this term should be construed. Compls. Br. at 452-53. Respondents argue that this term should be construed to mean "receiving at regular intervals." Resps. Br. at 152-52.

As proposed by Respondents, the claim term "periodically receiving [a transmission signal from a transmitter]" is construed to mean "receiving at regular intervals," which is a construction that comports with the plain meaning of the term as understood by a person of ordinary skill in the art, and is consistent with the intrinsic evidence.

The plain meaning of "periodically" is "at regular intervals" or periods. RX-2811C (Vojcic WS) at Q&A 264; RX-0006C (Heegard WS) at Q&A 909-15. This plain meaning construction was adopted by the court in a previous litigation, and Complainants agreed with the construction at that time. *See* RX-1345 (Sony Opinion) at 17.

The language of the other '867 claims are also in accord with Respondents' proposed construction. For instance, claims 2 and 21 recite "periodically waking the receiver from a sleep mode to receive transmissions." The '867 specification describes "periodically" waking or energizing the transceivers from a sleep mode at fixed, recurring intervals. JX-0005 ('867

patent) at Fig. 7; col. 3, lns. 11-16 ("transceivers in the stations 12.1-12.6 are periodically energized at regular intervals such that the stations 12.1-12.6 wake up from a doze state"); col. 1, lns. 42-44 ("transmitter timer means for controlling periodic generation of transmission signals"); col. 2, ln. 66 – col. 3, ln. 1 ("the stations 12.1-12.6 are operated in a power-save-mode in which their transceivers are periodically de-energized"); col. 3, lns. 27-29 ("with the exception of the periodic waking to receive the TIM packets, a station 12.1-12.6 remains in a power saving doze state").

Therefore, the claim term "periodically receiving [a transmission signal from a transmitter]" is construed to mean "receiving at regular intervals."

3. "a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer" / "a timestamp for synchronizing the receiver timer with a transmitter timer that counts up to n counts, the timestamp being a value m"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer" "a timestamp for synchronizing the receiver timer with a transmitter timer that counts up to n counts, the timestamp being a value m"	No construction necessary. Alternatively, "a timestamp representing a value of a counter in the transmitter"	"a timestamp representing a value m within the range 0 to n in the counter of the transmitter, where n represents the interval between transmission signals"

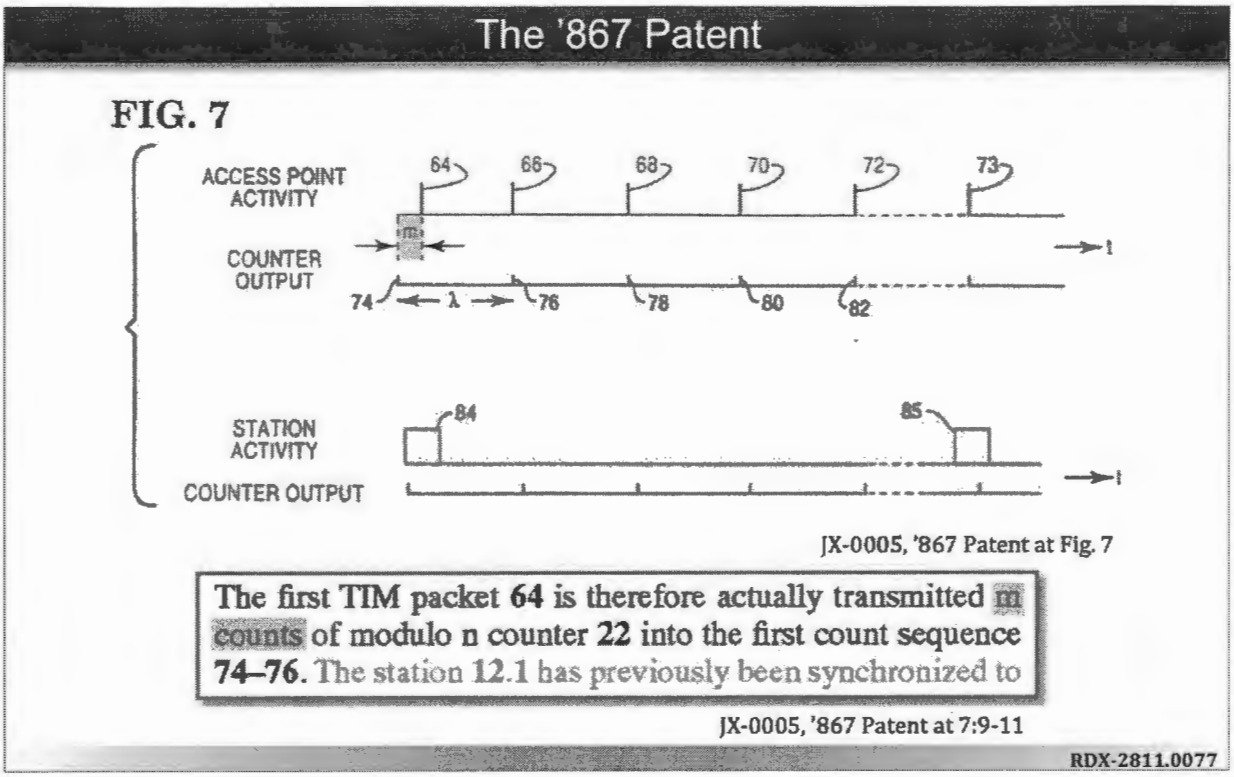
The claim terms "a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer" and "a timestamp for synchronizing the receiver timer with a transmitter

timer that counts up to n counts, the timestamp being a value m" (the "timestamp phrases") appear in asserted claims 20, 26, 34, 47, and 49 of the '867 patent. Complainants take the position that these terms need no construction, but argue that they should be construed to mean "a timestamp representing a value of a counter in the transmitter" in the event it is decided these terms should be construed. Compls. Br. at 453-56. Respondents argue that these terms should be construed to mean "a timestamp representing a value m within the range 0 to n in the counter of the transmitter, where n represents the interval between transmission signals." Resps. Br. at 139-46.

As proposed by Respondents, the timestamp phrases are construed to mean "a timestamp representing a value m within the range 0 to n in the counter of the transmitter, where n represents the interval between transmission signals."

The timestamp phrases expressly recite "value m," which the specification and the prosecution history define as the delay between the time the next transmission of the TIM[48] packet is scheduled to occur and the time of its actual transmission. JX-0005 ('867 patent) at Fig. 7; col. 7, lns. 9-11; RX-0006C (Heegard WS) at Q&A 916-28; RX-2813C (Heegard RWS) at Q&A 332-343; RX-2811C (Vojcic WS) at Q&A 221; *see* RDX-2811.0077.

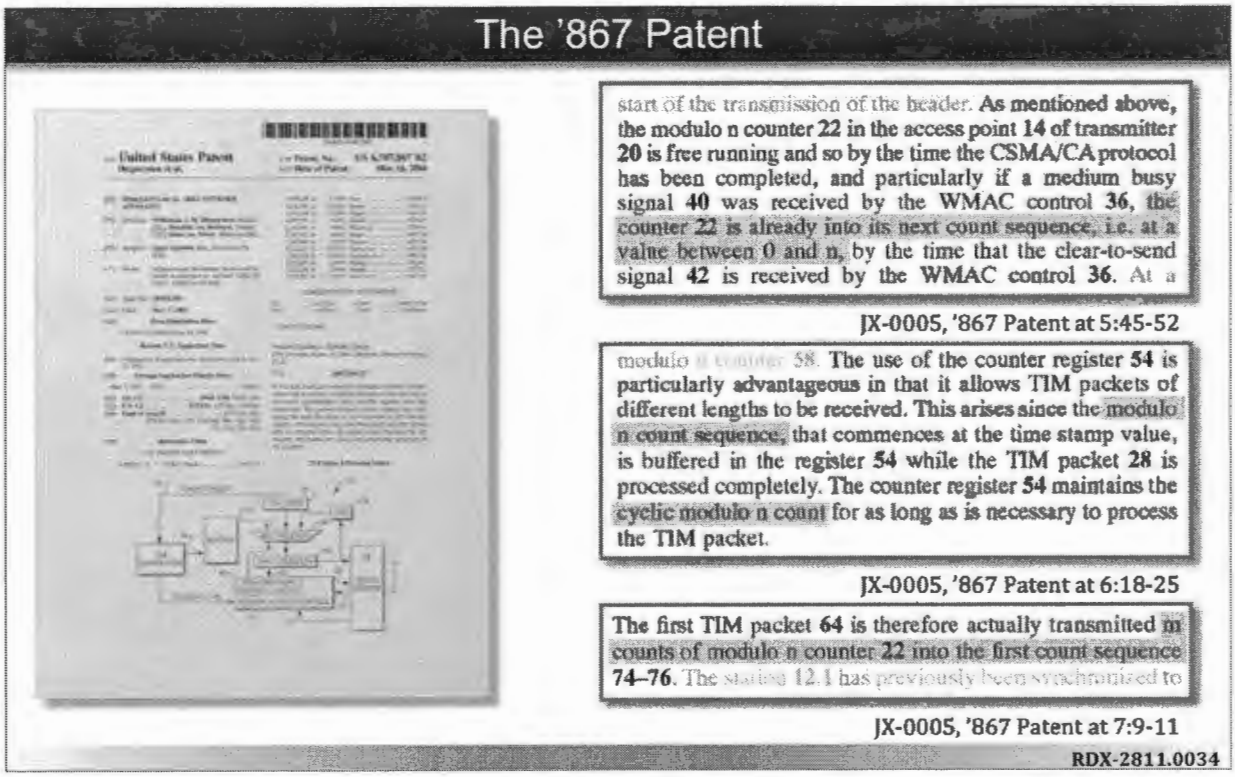
[48] "TIM" is an acronym for "traffic indication message." JX-0005 at col. 3, lns. 8-11.



As illustrated above in RDX-2811.0077, the specification describes Figure 7 and explains that the first TIM packet 64 is delayed by "m counts," and the timestamp will equal these "m counts" of delay. JX-0005 ('867 patent) at col. 7, lns. 9-15. The entire specification uses "m" consistent with only one meaning, which is the amount of delay.

During prosecution of the '867 patent, the applicants stated that m is the length of the delay, explaining, "If there was a delay (e.g. m counts), the 'time stamp' informs the receiver of the length of the delay (i.e. m counts)." RX-1165 (file history of '661 application) at REA837ITC00000498-99, 526; JX-0006 (file history of '867 patent) at JX-0006.0232-33; RX-2811C (Vojcic WS) at Q&A 222; RDX-2811.0078-79; Katti Tr. 1893-1894 ("Q. So the applicant is saying, here, that this timestamp not only indicates whether there was a delay, but how long the delay was. That's what they wrote here, right? A. It indicates how long was that delay.").

Each asserted claim also requires that the timestamp represent a value m within a "count sequence." As illustrated below, the '867 specification defines "count sequence" as "a value between 0 and n," by referring to the receiver as being "already into its next count sequence, *i.e.*, at a value between 0 and n." JX-0005 ('867 patent) at col. 5, lns. 49-51; RDX-2811.00034.



RDX-2811.00034.

During prosecution, the applicants explained that "timestamp" was "well defined in Applicants' specification" as "represent[ing] a value m within a count sequence," and that "[t]he count sequence ranges from 0 to n." RX-1165 (file history of '661 application) at REA837ITC00000474, 498-99 & n.*, 501-03 & n.****; RX-2811C (Vojcic WS) at Q&A 222-24. The applicants also distinguished prior art whose timer was "not caused to start counting from a value which is intermediate any count sequence such as a value m, where the

count sequence ranges from 0 to n, and 0 < m < n." RX-1165 (file history of '661 application) at 109; RX-2811C (Vojcic WS) at Q&A 224.

The specification defines "n" as the timer interval between successive TIM packets.[49] For example, the specification describes "A TIMER INTERVAL FIELD which indicates the value of n of the modulo n counter in the transmitter 20," and states, "[t]he modulo n [transmitter counter] functions as a timer and when the count value reaches n, a TIM function generator 24 is triggered by way of an interrupt signal 25 indicating that the next TIM packet should be constructed by way of a radio modem 26." JX-0005 ('867 patent) at col. 4, lns. 57-61, col. 5, lns. 5-6. One of the named inventors, Mr. Diepstraten, [

] JX-0020C (Feb. 15, 2013 Diepstraten Dep.) at 45-46; RX-2683 (Exhibits to Diepstraten Dep.). Complainants' expert Dr. Katti argues that this definition of n, which is the only definition of n in the intrinsic record, is merely a "preferred embodiment" and that n as used in the claims can represent "any whole number." CX-1641C (Katti WS) at Q&A 433. The '867 patent, however, discloses and suggests no value for n that represents anything other than the interval between transmission signals.

Complainants' proposed construction, "a timestamp representing a value of a counter in the transmitter," treats the terms "value m," "count sequence," and "synchronizing" as nonexistent. Complainants' proposed construction is also contrary to the intrinsic evidence, including the applicants' statements to the PTO during prosecution that "timestamp" was "well

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49 A TIM packet, or Traffic Indication Message, is shown in Figure 3 of the '867 patent. JX-0005 ('867 patent) at Fig. 3; col. 2, lns. 21-22. TIM packets are transmitted at regular intervals from an access point, or transmitter, to indicate which stations, or receiver, have information ready for transmission. *Id.* at col. 3, lns. 8-11.

defined" in the specification as "a value m within a count sequence," where "the count sequence ranges from 0 to n, where 0 < m < n," and the counters "remain in synchronization as they cyclically count up to value n," and that the purpose of the claimed "timestamp" is to "inform the receiver of the length of the delay (i.e. m counts)." RX-2811C (Vojcic WS) at Q&A 224, 229-31.

Complainants' proposed construction also strips the claimed timestamp of its essential purpose of enabling accurate synchronization between the transmitter and a receiver. As named inventor Mr. Diepstraten testified, [

] JX-0020C (Diepstraten Dep.) at col. 15, lns. 5-23; RX-2683 (Exhibits to Diepstraten Dep.). For the receiver to achieve synchronization, it must know the amount by which an arriving transmission signal has been delayed in order to align its counter correctly. RX-2811C (Vojcic WS) at Q&A237-238. Complainants' proposed construction reads this essential function of the timestamp, *i.e.*, the act of synchronization itself, out of the asserted claims.

Accordingly, the timestamp phrases are construed to mean "a timestamp representing a value m within the range 0 to n in the counter of the transmitter, where n represents the interval between transmission signals.

4. "accounts for delay" / "accounts for delays" / "accounts for a delay"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"accounts for delay" "accounts for delays" "accounts for a delay"	No construction necessary. Alternatively, "accounts for the delay in transmission of a signal"	"indicates the amount of delay"

The claim terms "accounts for delay," "accounts for delays," and "accounts for a delay" appear in asserted claims 20, 32, 33, 37-40, 47, and 49-51 of the '867 patent. Complainants take the position that these terms need no construction, but argue that they should be construed to mean "accounts for the delay in transmission of a signal" in the event it is decided these terms should be construed. *See* Compls. Br. at 456-57; Joint List of Proposed Claim Constructions. Respondents argue that these terms should be construed to mean "indicates the amount of delay." Resps. Br. at 149-50.

As proposed by Respondents, the claim terms "accounts for delay," "accounts for delays," and "accounts for a delay" are construed to mean "indicates the amount of delay."

The specification describes a timestamp that represents a value m from 0 to n, *i.e.*, the interval between transmission signals, which is the length of any delay between the scheduled and the actual transmission of the TIM packet. JX-0005 ('867 patent) at Fig. 7; col. 7, lns. 9-11; Thus, the timestamp indicates the amount of delay.

5. "as to synchronize the receiver timer with the transmitter timer"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"as to synchronize the receiver timer with the transmitter timer"	No construction necessary.	Indefinite.

The claim term "as to synchronize the receiver timer with the transmitter timer" appears in asserted claim 49 of the '867 patent. Respondents take the position that this term would be indefinite in the event Complainants' proposed construction for the timestamp phrases were adopted. *See* Resps. Br. at 154-55. Inasmuch as Complainants' proposed construction for the timestamp phrases was not adopted, Respondents' argument with respect to the claim term "as to synchronize the receiver timer with the transmitter timer" is moot.

6. "the traffic pending field"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"the traffic pending field"	No construction necessary.	Indefinite.

The claim term "the traffic pending field" appears in asserted claim 23 of the '867 patent. Respondents argue that this claim term is indefinite. Resps. Br. at 155. Whether or not this term is indefinite is discussed below in the section relating to the validity of the '867 patent.

7. "at the time of transmission of the transmission signal" / "an actual time of transmitting the transmission signal"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"at the time of transmission of the transmission signal" "an actual time of transmitting the transmission signal"	No construction necessary. Alternatively, "when the transmission signal is transmitted"	"at the beginning of the transmission of the packet"

The claim terms "at the time of transmission of the transmission signal" and "an actual time of transmitting the transmission signal" appear in asserted claims 32, 34, 37, 39, 47, and 49 of the '867 patent. Complainants take the position that these terms need no construction, but argue that they should be construed to mean "when the transmission signal is transmitted" in the event it is decided these terms should be construed. *See* Compls. Br. at 458; Joint List of Proposed Claim Constructions. Respondents argue that these terms should be construed to mean "at the beginning of the transmission of the packet." Resps. Br. at 150-52.

The administrative law judge declines to adopt Respondents' proposed construction. Respondents' proposed construction is not supported by the intrinsic evidence, and the proposed construction does not add any clarity to the meaning of the claim terms. Respondents propose that these terms refer to the transmission of "the packet," but do not specify what "the packet" is. *See* CX-1641C (Katti RWS) at Q&A 461-463. In fact, the claims themself refer to a "signal," but not to a "packet."

Therefore, it is determined that the claim terms "at the time of transmission of the transmission signal" and "an actual time of transmitting the transmission signal" do not need construction, but should instead be given their plain and ordinary meaning.

8. "a receiver counter that counts up to n counts"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"a receiver counter that counts up to n counts"	No construction necessary. Alternatively, "a counter in the receiver configured to count up to n counts, where n is any whole number"	"receiver counter that counts from 0 to n, where n represents the interval between transmission signals"

The claim term "a receiver counter that counts up to n counts" appears in asserted claims 20, 26, 34, 47, and 49 of the '867 patent. Complainants take the position that this claim term does not need construction, but argue that it should be construed to mean "a counter in the receiver configured to count up to n counts, where n is any whole number" in the event it is decided the term should be construed. *See* Compls. Br. at 458; Joint List of Proposed Claim Constructions. Respondents argue that this term should be construed to mean "receiver counter that counts from 0 to n, where n represents the interval between transmission signals." Resps. Br. at 146-48.

As proposed by Respondents, the claim term "a receiver counter that counts up to n counts" is construed to mean "receiver counter that counts from 0 to n, where n represents the interval between transmission signals."

As explained above with respect to the "timestamp" phrases, the specification defines "n" as the timer interval between successive TIM packets. As illustrated below in RDX-2811.0088, during prosecution of the parent '661 patent application, the applicants explained the importance of the cyclical count from 0 to n, which they called the "count sequence," of the receiver and transmitter counters. RX-1165 (file history of '661 application) at 80, 104-05 & n.*, 132; RX-2811C (Vojcic WS) at Q&A 243; *see* RDX-2811.0088. The '867 patent is therefore based on the timestamp being a value m within a cyclical count from 0 to n, where m is the length of the delay and n is the interval between transmission signals, and a receiver counter that cyclically counts from 0 to n, where n is the interval between transmission signals, is consistent with this understanding.

'661 File History

m. As a result, the two counters 22 and 58 remain in synchronization as they cyclically count up to value n. (See e.g. Applicants' specification at page 13, lines 6-16).

RX-1165 (U.S App. No. 08/155,661 File History) at 80

commences its count sequence at value m. As a result, the two counters 22 and 58 remain in synchronization as they cyclically count up to value n. (See e.g. Appellants' specification at page 13, lines 6-16).

RX-1165 (U.S App. No. 08/155,661 File History) at 105

commences its count sequence at value m.** As a result, the two counters 22 and 58 remain in synchronization as they cyclically count up to value n. (See e.g. Appellants' specification at page 13, lines 6-16).

RX-1165 (U.S App. No. 08/155,661 File History) at 132

RDX-2811.0088

By allowing n to be "any whole number," Complainants' proposed construction ignores the definition in the specification and what they told the USPTO. Complainants' proposed construction also renders the phrase "up to n counts" meaningless. Every counter must have some maximum value, and thus, Complainants' proposed construction reduces the phrase "a receiver counter that counts up to n counts" to just "a receiver counter."

Complainants' expert Dr. Katti argues that, because the specification describes a "free running" counter which counts up to n, that "the specification places no limits on the value of n." *See* CX-1641C (Katti RWS) at Q&A 437. This position contradicts what the applicants told the USPTO, which is that "free running" means "uncontrolled by a signal source," and therefore has nothing to do with the value of n. RX-1165 (file history of '661 application) at REA837ITC00000473. Indeed, Dr. Katti testified that the specification describes the "free running" counter as resetting to zero upon reaching the value n, which is the value of the interval

between transmission signals. Katti Tr. 1897-1898; 1899 (describing JX-0005 ('867 patent) at col. 5, lns. 45-51). Thus, the only embodiment in the '867 patent uses a timestamp for synchronization in the context of timers or counters that roll over during a transmission signal interval. Negus Tr. 435.

Therefore, the claim term "a receiver counter that counts up to n counts" is construed to mean "receiver counter that counts from 0 to n, where n represents the interval between transmission signals."

9. "timer interval field"

Claim Term/Phrase	Complainants' Construction	Respondents' Construction
"timer interval field"	No construction necessary. Alternatively, "a field which represents the time interval between transmissions"	"the value of n of the counter in the transmitter"

The claim term "timer interval field" appears in asserted claims 35 and 61 of the '867 patent. Complainants take the position that this claim term does not need construction, but argue that it should be construed to mean "a field which represents the time interval between transmissions" in the event it is decided the term should be construed. *See* Compls. Br. at 459; Joint List of Proposed Claim Constructions. Respondents argue that this term should be construed to mean "the value of n of the counter in the transmitter." Resps. Br. at 153-54.

As proposed by the Respondents, the claim term "timer interval field" is construed to mean "the value of n of the counter in the transmitter."

The '867 patent defines the "timer interval field" as a field which "indicates the value of n of the modulo n counter in the transmitter 20." JX-0005 ('867 patent) at col. 5, lns. 2-4. This express definition is consistent with the adopted construction.

C. Infringement

1. The Accused Timing Synchronization Functionality of the 802.11 Standards

In the '867 patent, a timestamp is used for synchronization in the context of timers or counters that roll over or reset upon reaching the transmission signal interval value. Negus Tr. 435. This permits a receiver to know when to expect the next transmission signal in the next transmission signal interval and wake up at the expected time. The record evidence shows that the IEEE 802.11 standard describes a different paradigm for synchronization.

In 802.11, the Beacon interval (*i.e.*, the transmission signal interval) is 2^{16}, but the standard timestamp is given the value of a transmitter counter that counts up to 2^{64}, and therefore will not be within the Beacon interval. *See* CX-0116C (IEEE Std. 802.11-2007) at LSIAgere837-01170257 (Section 7.3.1.3), LSIAgere837-011700588 (Section 11.1.2); RX-2813C (Heegard RWS) at Q&A 351-57. Typically, [

] *See* Negus Tr. 437-438.

[

]

Rather, [ ] as discussed further below. The differences between the IEEE 802.11 standard and the '867 patent can be explained by the analogy offered by Dr. Heegard. RX-2813C (Heegard RWS) at QA 388; Hg. Tr. (Heegard) at 1156:20-1159:23. Rather than using a timestamp to inform a receiver of the next expected Beacon signal so that a receiver need only wake up the expected time of the next

Beacon signal, the IEEE 802.11 standard provides for a different kind of synchronization by which a receiver can only estimate roughly when the next Beacon may arrive. Hg. Tr. (Heegard) at 1161-1164; RX-2813C (Heegard RWS) at QA 351-57, 365, 392.

Complainants concede there is no literal infringement under Respondents' proposed constructions for the following claim terms:

- "a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer" (CX-1596C (Negus WS) at QA 354 (claim 20), 381 (claim 26), 422 (claim 34), 450 (claim 47));
- "a timestamp for synchronizing the receiver timer with a transmitter timer that counts up to n counts, the timestamp being a value m" (*id.* at QA 455 (claim 49));
- "receiver [counter/timer] that counts up to n counts" (*id.* at QA 321 (claim 20), 379 (claim 26), (claim 34),[50] 448 (claim 47), 453 (claim 49));
- "accounts for [delays/a delay]" (*id.* at 370 (claim 20), 419 (claim 33), 444 (claim 38), 446 (claim 40), 465 (claim 50), 466 (claim 51)); and
- "timer interval field" (*id.* at 439 (claim 35)).

[50] Complainants' expert, Dr. Negus, does not specifically address the "receiver counter counts up to n counts" limitation of claim 34. *See* CX-1596C (Negus WS) at QA 420-30.

2. Complainants' Reliance on HDL Code to Show Infringement

Complainants' expert Dr. Negus relies on analysis of HDL code for the accused products for his '867 infringement analysis, just as he did for his '958 infringement analysis. *See* CX-1596C (Negus WS) at Q&A 138.

[

]

For the Realtek products, Dr. Negus found that [ ] relevant to his infringement analysis of the '867 patent [ ] CX-1596C (Negus WS) at Q&A 141. Dr. Negus summarized [ ] and then analyzed the '867 patent issues separately for [ ] *Id.* Dr. Negus determined that [ ] in terms of issues related to the infringement analysis. *Id.* Realtek's expert Dr. Vojcic testified to [ ] *See, e.g.*, Vojcic Tr. 1212.

3. Claim 20

The record evidence shows that the accused products do not satisfy all limitations of claim 20.

a. A receiver, comprising:

i. 802.11

Respondents' products are [ ] *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §1.1; CX-1596C (Negus WS) at Q&A 301. An STA in an

[51] [ ]

infrastructure BSS[52] is a "receiver." JX-0005 ('867 patent) at Figs. 1, 5; col. 2, lns. 48-62; col. 5, lns. 64-67; CX-1596C (Negus WS) at Q&A 301.

ii. Ralink

[

"[53] *See, e.g.*, CX-0562C , CX-0563C , CX-0564C ; CX-0565C ; CX-0566C ; CX-0567C ; CX-0568C ; CX-0569C ; CX-0570C ; CX-1596C

CX-0565C ; CX-1596C

JX0014C

]

iii. Realtek

Datasheets for Realtek's chips state that each such chip is [

] and in various exemplary documents [

[52] "BSS" is an acronym for "basic service set."

[53] "RF" is an acronym for "radio frequency."

] *See, e.g.*, CX-0571C [ ]) at 8; CX-0572C [ ]) at 11; CX-0573C [ ]) at 8; CX-0575C [ ]) at 8; CX-0576C [ ]) at 9; CX-0577C [ ]) at 9; CX-0578C [ ]) at 10; CX-0579C [ ]) at 116; CX-0580C [ ]) at 57; CX-0581C [ ]) at 39; CX-0582C [ ]) at 37; CX-0583C [ ]) at 38; CX-0584C [ ]) at 9-10; CX-0585C [ ]) at 10; CX-1596C (Negus WS) at Q&A 307. The documents also show exemplary usage of Realtek's chips [ ] in combination with other elements such as [

] *See, e.g.*, CX-0571C [ ]) at 8; CX-0572C [ ]) at 11; CX-0573C [ ]) at 8; CX-0575C [ ]) at 8; CX-0576C [ ]) at 9; CX-0577C [ ]) at 9; CX-0578C [ ]) at 10; CX-0579C [ ]) at 116; CX-0580C [ ]) at 57; CX-0581C [ ]) at 39; CX-0582C [ ]) at 37; CX-0583C [ ]) at 38; CX-0584C [ ]) at 9-10; CX-0585C [ ]) at 10; CX-1596C (Negus WS) at Q&A 307-308. As with Ralink's chips, Realtek's chips need not include RF circuitry to constitute a receiver. *Id.* at Q&A 309. Even if certain Realtek chips did not comprise [ ] any [

] would still meet this claim element. *Id.* Finally, Realtek's witness [ ] testified that Realtek's Chips include [ ] *See, e.g.*, JX-0017 [ ] at 35-36, 45.

iv. Funai

For those of Funai's products that interoperate with 802.11 standards and contain at least one of Ralink's chips or Realtek's chips, the evidence shows a "receiver." Ralink's chips or Realtek's chips also inherently show a "receiver" within Funai's products. CX-1596C (Negus WS) at Q&A 311.

b. a receiver counter that counts up to n counts, and

Applying the claim construction adopted above, the accused products do not satisfy the claim limitation "a receiver counter that counts up to n counts." This limitation is construed to mean "a receiver counter that counts from 0 to n, where n represents the interval between transmission signals."

Complainants' expert Dr. Negus admits that the accused products [ ] under the adopted constructon. *See* CX-1596C (Negus WS) at Q&A 321; RX-2811C (Vojcic WS) at Q&A 245; RX-2813C (Heegard RWS) at Q&A 366, Q&A 393-99. [ ] RX-2811C (Vojcic WS) at Q&A 245; RX-2813C (Heegard RWS) at Q&A 366, Q&A 393-99.

In addition, the accused [ ] in the accused Realtek products does not meet this limitation [ ] RX-2811C (Vojcic WS) at Q&A 246; CX-0298C (Realtek Source Code) at REA837ITC-SC-00000625-26.

If, however, Complainants' proposed construction of "a receiver counter that counts up to n counts" were adopted such that the term meant "a counter in the receiver configured to count up to n counts, where n is any whole number," then the evidence shows that the accused products would satisfy this claim limitation. The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. 802.11 – Analysis Under Alternate Construction

[ ] Respondents' products

[54]] as shown in

CDX-0609 (Negus 010). *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §11.1.2; CX-1596C (Negus WS) at Q&A 312. [

]

ii. Ralink – Analysis Under Alternate Construction

[CX-1596C

CX-0561C ; CX-1596C

CX-0561 ; CX-1596C

JX-0014C

CX-0562C ; CX-0563C

; CX-0564C ; CX-0566C

[54] "TSF" is an acronym for "Timing Synchronization Function."

[; CX-0567C ; CX-0568C ; CX-0569C ; CX-0570C 1; CX-1596C .]

iii. Realtek – Analysis Under Alternate Construction

Realtek's chips include [ ][64]. CX-1596C (Negus WS) at Q&A 315. This structure is described by the module [ ] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00000620-22, 25-27,647-48,2190,92,93,95,2195-96,2410,11,13,18-20; CX-1596C (Negus WS) at 98. [ ] CX-1596C (Negus WS) at Q&A 316; CX-0298C (Realtek Source Code) at REA837ITC-SC-00002190,92,93,95 [ ]; REA837ITC-SC-00002195-96 [ ]; REAT837ITC-SC-00002410,11,13,18,19 [ ]; REA837ITC-SC-00002413,19-20 [ ]; REA837ITC-SC-00000620-22, 26 [ ]; REA837ITC-SC-00002413,19,20 [ ].

[ ] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00000626,647,2196,2419; CX-1596C (Negus WS) at Q&A 317. Exemplary datasheets for Realtek's chips indicate the presence of [ ] *See, e.g.*, CX-0572C [ ]) at 123-24; CX-0579C [ ]) at 107-108; CX-0580C [ ]) at 49-51; CX-0581C [ ])

at 34; CX-0582C [ ]) at 33; CX-0583C [ ]) at 32; CX-1596C (Negus WS) at Q&A 318.

iv. Funai – Analysis Under Alternate Construction

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips or Realtek's chips, the same evidence described above shows that this limitation is met by structure within Ralink's chips or Realtek's chips and is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 319.

v. Doctrine of Equivalents

In addition to arguing literal infringement of this claim limitation under Complainants' proposed construction, Complainants also allege that the accused products satisfy this claim limitation under the doctrine of equivalents in the event Respondents' proposed construction is adopted. *See* Compls. Br. at 464-66. Complainants' doctrine of equivalents argument is not persuasive, however, because there is no evidence that the differences between the claimed and accused "receiver counter" are insubstantial.

Complainants argue that the function of the claimed "receiver counter" is "to provide a local timer within the 'receiver.'" Compls. Br. at 466. The '867 specification, however, states: "[E]nergization of the receiver 48 is controlled by a modulo n counter 58 which functions as a timer to wake up the station 12.1 from a doze state to receive the TIM packet 28 transmitted from the access point 14." JX-0005 ('867 patent) at col. 6, lns. 3-6. "[T]he receiver counter tells the receiver to wake up by approaching the value 'n,' because TIM generation signals are generated 'each time the modulo n counter 22 in the access point 14 reaches its value n.'" *Id.* at col. 7, lns. 1-6. During prosecution, the applicants described the function the same way . *See, e.g.*, JX-0006 (file history of '867 patent) at JX-0006.0232-34; RX-1165 (prosecution history of

'661 application) at REA837ITC00000498-500. Accordingly, the function of the claimed receiver counter is to "wake up" to receiver. Complainants have not shown that the alleged receiver counters in the accused products perform this function.

c. a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a timestamp field,

i. 802.11

Respondents' products are [ ] CX-1596C (Negus WS) at Q&A 326. [ ] Respondents' products are [

] *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §11.1.1.1; CX-1596C (Negus WS) at Q&A 326-33. Such an AP is the "transmitter" of this claim element. *See, e.g.*, JX-0005 ('867 patent) at Figs. 1, 2; col. 2, lns. 48-62; col. 4, lns. 52-53; CX-1596C (Negus WS) at Q&A 326-33. The AP (or "transmitter") is required to "periodically transmit special frames called Beacon frames that contain a copy of its TSF timer to synchronize the TSF timers of other STAs in a BSS." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §11.1.1.1; CX-1596C (Negus WS) at Q&A 326-33. Receivers must be capable of receiving these Beacon frames "at a nominal rate." CX-1596C (Negus WS) at Q&A 326-33. Each STA (or "receiver") "shall always accept the timing information in Beacon frames sent from the AP servicing its BSS." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §11.1.1.1; CX-1596C (Negus WS) at Q&A 326-33. The interval between Beacon frames is defined by the dot11BeaconPeriod parameter of the STA." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §11.1.2; CX-1596C (Negus WS) at Q&A

[55] "AP" is an acronym for "access point."

326-33. Respondents' products are therefore [

] *Id.*

Further, any 802.11 STA device that interoperates with any of the 802.11 radio-based PHY layers must have at least a "modulator" and a "demodulator," and hence a "radio modem." CX-1596C (Negus WS) at Q&A 331.

Finally, the "Beacon frames" sent by an 802.11 AP always include at least a "Timestamp field." *See, e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at §§7.2.3.1, 7.3.1.10, 11.1.2, Table 7-8; CX-1596C (Negus WS) at Q&A 333. "Beacon frames" that are sent "periodically" by an 802.11 AP disclose the "transmission signal from a transmitter" of this claim element and therefore any 802.11 standard STA device with a compatible TSF timer implementation must comprise structure that meets the limitations of this claim element. *Id.*

ii. Ralink

[

CX-0561C

; CX-1596C

CX-0561C

; CX-1596C

]"

[

.]

[

JX-0014C

CX-0562C ; CX-0563C ; CX-0564C

; CX-0565C ; CX-0566C

; CX-0567C ; CX-0568C

; CX-0569C ; CX-0570C ;

CX-1596C .]

[

.]

iii. Realtek

Realtek's chips, [ ] comprise a structure described by the module

[

] *See, e.g.*, CX-0298C (Realtek Source Code) at

REA837ITC-SC-000002582,2616,2633,2637-38,2792-93,3026-27; CX-1596C (Negus WS) at

Q&A 339. [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-000002637-38, 2792-93, 3026-27; CX-1596C (Negus WS) at Q&A 340. [

] *Id.* [

] *Id.*

Moreover, testimony from Realtek's fact witness [ ] indicates that Realtek's chips include this capability. *See* JX-0017C [ ] at 40. Datasheets for Realtek's chips illustrate [

] *See, e.g.*, CX-0571C [ ]) at 8; CX-0572C [ ]) at 11, 23-24; CX-0573C [ ]) at 8; CX-0575C [ ]) at 8; CX-0576C [ ]) at 9; CX-0577C [ ]) at 9; CX-0578C [ ]) at 10; CX-0579C [ ]) at 107-08, 116; CX-0580C [ ]) at 49-51, 57; CX-0581C [ ]) at 34, 41; CX-0582C [ ]) at 33, 37; CX-0583C [ ]) at 32, 38; CX-0584C [ ]) at 9-10; CX-0585C [ ]) at 10; CX-1596C (Negus WS) at Q&A 342.

Realtek's chips need not contain [ ] to meet this claim limitation. CX-1596C (Negus WS) at Q&A 343. Even if certain Realtek chips did not comprise [ ] any [ ] would still meet the limitation of this claim

element since each such chip is intended for use [ ] and must have at least [ ] *Id.*

iv. Funai

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Ralink's chips or Realtek's chips. This limitation is also met by structure within Funai's products. CX-1596C (Negus WS) Q&A 344; *see* CX-0587C (Funai Source Code) at FUNAI-ITC837-SC-00000068.

d. the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer,

Applying the claim construction adopted above, the accused products do not satisfy the claim limitation "a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer." This limitation is construed to mean "a timestamp representing a value m within the range 0 to n in the counter of the transmitter, where n represents the interval between transmission signals."

Complainants concede there is no literal infringement under the adopted construction. *See* CX-1596C (Negus WS) at Q&A 354; Negus Tr. 407-409. The accused timestamp is not the length of delay, or "value m," and is not within a cyclical count from 0 to the timer interval, or "n." RX-2811C (Vojcic WS) at &QA 232-33; RX-2813C (Heegard RWS) at Q&A 367-68. Rather, [ ] *Id.* This is consistent with the IEEE 802.11 standard, which requires 64-bit

counters in the access points and stations and a corresponding 64-bit timestamp field. *Id.*; RX-0013C (IEEE Std. 802.11-2007) at 837RALINK000001482.

If, however, Complainants' proposed construction of "a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer" were adopted such that the term meant "a timestamp representing a value of a counter in the transmitter," then the evidence shows that the accused products would satisfy this claim limitation. The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. Analysis Under Alternate Construction

As described above, in an 802.11 WLAN the AP periodically transmits Beacon frames that include timestamp fields. The timestamp field is a copy of the AP's TSF timer, which is a transmitter timer with a maximum value of 2^{64} microseconds. The "timestamp field" is thus a value m in the transmitter timer's count sequence between 0 and 2^{64}. CX-1596C (Negus WS) at Q&A 351.

ii. Doctrine of Equivalents

In addition to arguing literal infringement of this claim limitation under Complainants' proposed construction, Complainants also allege that the accused products satisfy this claim limitation under the doctrine of equivalents in the event Respondents' proposed construction is adopted. *See* Compls. Br. at 471-73. Complainants' doctrine of equivalents argument is not persuasive, however, because there are substantial differences between the claimed and accused timestamp in the accused products. RX-2811C (Vojcic WS) at Q&A 234-39. Unlike the claimed timestamp, the accused timestamp [

] *Id.*

The function of the claimed timestamp is to inform the receiver of the length of the delay. JX-0005 ('867 patent) at col. 7, lns. 1-21; RX-1165 (file history of '661 application) at REA837ITC00000526. The applicants told the USPTO that the claimed timestamp has the "very beneficial characteristics of providing information to the receiver as to whether . . . there was a delay . . . and how long was that delay." RX-1165 (file history of '661 application) at 109, n.*****. Thus, with the claimed timestamp, a receiver has a reference point to know the time of the next scheduled transmission. RX-2811C (Vojcic WS) at Q&A 235-38.

The accused timestamp [

]

RX-2811C (Vojcic WS) at Q&A 235. [

] *Id.*

The way the claimed timestamp performs its function is by representing the amount of delay and resetting the receiver counter to start counting at the "m counts" of delay. JX-0005 ('867 patent) at col. 7, lns. 1-21; RX-1165 (file history of '661 application) at REA837ITC00000526; RX-2811C (Vojcic WS) at Q&A 236. The accused timestamp [

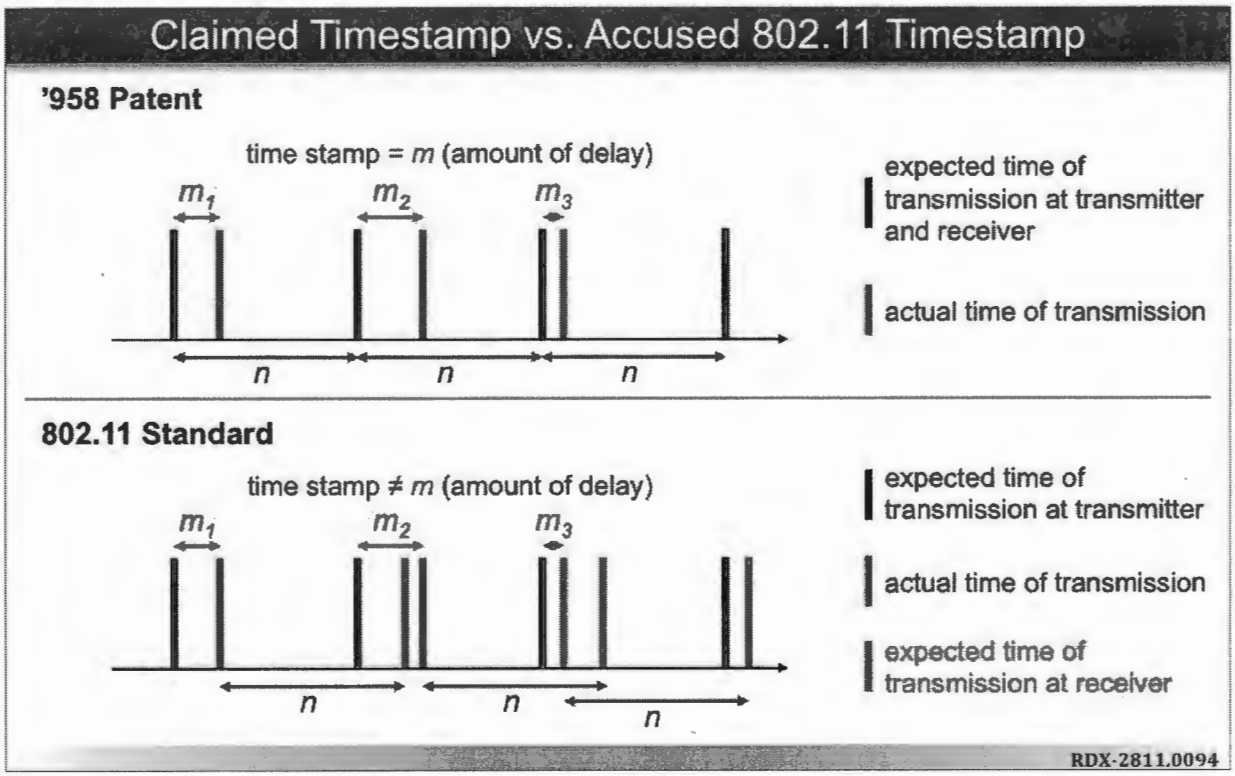
]

RX-2811C (Vojcic WS) at Q&A 236.

The result of using the claimed timestamp is that the receiver receives information about the length of the delay for knowing when the next frame is scheduled to arrive. JX-0005 ('867 patent) at col. 7, lns. 16-19; RX-1165 (file history of '661 application) at REA837ITC00000526;

RX-2811C (Vojcic WS) at Q&A 237-39. [

] The illustration below shows the substantially different result. RDX-2811.0094; RX-2811C (Vojcic WS) at Q&A 237-39.



The top portion of the illustration above shows the result of using the claimed timestamp. RX-2811C (Vojcic WS) at Q&A 238; RDX-2811.0094. The three blue lines show the actual time of transmission, and indicate three different amounts of delay, m_1, m_2, and m_3. *Id.* Inasmuch as the claimed timestamp is equal to the amount of delay m, the receiver counter can begin counting from m, and will arrive at the timer interval n, at the same time as the transmitter counter. *Id.* As a result, the expected time of transmission at the receiver is the same as the expected time of transmission at the transmitter, as the black lines show. The patent explains the importance of this result:

> [Since] the counter in the station 12.1 is accurately synchronized with the counter 22, the station 12.1 can be controlled to accurately wake up in time to receive only every xth TIM packet without requiring the station 12.1 to wake up unnecessarily early as would be required to assure receipt of the TIM packet if accurate synchronization between the counters 22, 58 was not available. The reduction in the need for early wake up of the station 12.1 advantageously reduces the power consumption of the station 12.1.

JX-0005 ('867 patent) at col. 6, lns. 49-55.

The bottom portion of the above illustration shows the result of using the accused timestamp, [ ] RX-2811C (Vojcic WS) at Q&A 238; RDX-2811.0094. [ ] *Id.* [ ] RX-2811C (Vojcic WS) at Q&A 238. Without the claimed timestamp, the accused receivers [ ]" which the patent teaches against, in order to receive the Beacon frame, with the result that they consume more power. *Id.*; JX-0005 ('867 patent) at col. 6, lns. 49-55.

The claimed and accused timestamps are also not interchangeable. RX-2811C (Vojcic WS) at Q&A 239. The claimed receiver would not work if it received the accused timestamp because the accused timestamp [ ] *Id.* Any attempt to use the arbitrary number from 0 to 2^{64}-1 as a delay would not work because the claimed receiver requires the length of the delay, m, in a count sequence between 0 and the timer interval, n. *Id.*

e. and wherein the timestamp accounts for delays due to a busy signal on a medium access protocol.

Applying the claim construction adopted above, the accused products do not satisfy the claim limitation "the timestamp accounts for delays due to a busy signal on a medium access protocol." The claim terms "accounts for delay," "accounts for delays," and "accounts for a delay" are construed to mean "indicates the amount of delay."

The accused products do not satisfy this claim limitation, because the accused timestamp [ ] RX-2811C (Vojcic WS) at Q&A 253-54. As discussed above, that timestamp is merely [ ] *Id.*

Complainants' expert Dr. Negus concedes there is no literal infringement of this claim limitation under Respondents' proposed construction with respect to claim 20. *See* CX-1596C (Negus WS) Q&A 370, Q&A 451, Q&A 456. There is no literal infringement of any of these claims and no infringement under the doctrine of equivalents for claim 20 (or any other claims) for the same reasons stated above with respect to the "timestamp" phrases. The claimed timestamp that "accounts for delays" informs the receiver of the precise amount of delay due to a busy signal at the transmitter, while the accused timestamp [ ] The claimed timestamp results in accurate synchronization, whereas the accused timestamp does not.

If, however, Complainants' proposed construction of "accounts for delays" were adopted such that the term meant "accounts for the delay in transmission of a signal," then the evidence shows that the accused products would satisfy this claim limitation. The following analysis sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. Analysis Under Alternate Construction

For an 802.11 AP, the transmission of "Beacon frames" must consider that "Though the transmission of a Beacon frame may be delayed because of CSMA deferrals, subsequent Beacon frames shall be scheduled at the undelayed nominal beacon interval" and that each "Beacon frame" is a "transmission according to the medium access rules specified in Clause 9." CX-1596C (Negus WS) at Q&A 359; CX-0116C (802.11 Standard, Jun. 2007) at §11.1.2.1, Fig. 11-1. Clause 9 shows "Physical and virtual carrier-sense functions are used to determine the state of the medium. When either function indicates a busy medium, the medium shall be considered busy; otherwise, it shall be considered idle." *See* CX-0116C (802.11 Standard, Jun. 2007) at §9.2.1; CX-1596C (Negus WS) at Q&A 359.

The transmission signals (or "Beacon frames") that carry the "timestamp" to Respondents' products are not always transmitted exactly when the periodic beacons are scheduled. CX-1596C (Negus WS) at Q&A 361. If there is a busy signal condition on the shared wireless medium, the transmission signals will be delayed. *Id.* at Q&A 362. The 802.11 Standard requires that "a Beacon frame shall set the value of the Beacon frame's timestamp so that it equals the value of the STA's TSF timer at the time that the data symbol containing the first bit of the timestamp is transmitted to the PHY." *Id.* In other terms, the timestamp is set for the actual time the timestamp is transmitted, rather than the scheduled time of transmission. *Id.* This accounts for "delays due to a busy signal on a medium access protocol" by ensuring that the timestamp represents the value of the transmitter TSF timer at the time of transmission. *Id.* If the timestamp were set for the time the transmission signal was scheduled for transmission, the timestamp would not enable accurate synchronization if it were transmitted at a later time due to some delay. *Id.*

ii. Doctrine of Equivalents

In addition to arguing literal infringement of this claim limitation under Complainants' proposed construction, Complainants also allege that the accused products satisfy this claim limitation under the doctrine of equivalents in the event Respondents' proposed construction is adopted. *See* Compls. Br. at 475-77. There is no infringement under the doctrine of equivalents for for the same reasons stated above with respect to the "timestamp" phrases.

4. Claim 23

The record evidence shows that the accused products do not satisfy all limitations of claim 23.

a. The receiver of claim 20,

As shown above, the accused products do not satisfy all limitations of asserted claim 20 under the adopted claim constructions.

b. wherein the transmission signal further includes a header field, which is transmitted before the timestamp field and the traffic pending field.

If Complainants' proposed claim constructions were adopted, the evidence shows that the accused products would satisfy the additional limitation of claim 23.

The 802.11 Standard mandates that the "Beacon frames" received by Respondents' products include a "MAC header" (or "header field") which precedes in time the "Timestamp" field of the "Beacon frame" and the "TIM" field. *See* CX-0116C (802.11 Standard, Jun. 2007) at §§ 7.2.3, 7.2.3.1, Figure 7-18, Table 7-8; CX-1596C (Negus WS) at Q&A 372. In the 802.11 Standard, "TIM" is an acronym for "traffic indication map." CX-0116C (802.11 Standard, Jun. 2007) at § 4. The Standard further provides that "Each bit in the [TIM] corresponds to traffic buffered for a specific STA within the BSS that the AP is prepared to deliver at the time the

beacon frame is transmitted." CX-0116C (802.11 Standard, Jun. 2007) at § 7.3.2.6. Thus, the "TIM" field indicates if there is "traffic pending" for any particular STA and as such is the "traffic pending field" that "indicates for which stations data packets are buffered." CX-1596C (Negus WS) at 121.

5. Claim 24

The record evidence shows that the accused products do not satisfy all limitations of claim 24.

a. The receiver of claim 23,

As shown above, the accused products do not satisfy all limitations of asserted claim 23 under the adopted claim constructions.

b. wherein the header field includes type data indicating a type of the transmission signal.

If Complainants' proposed claim constructions were adopted, the evidence shows that the accused products would satisfy the additional limitation of claim 24.

The 802.11 Standard mandates that the "Beacon frames" received by Respondents' products include "Type" and "Subtype" fields (or "type data") that indicate that the frame is a "Beacon frame." CX-0116C (802.11 Standard, Jun. 2007) at §§ 7.1.3.1, 7.1.2.1.2, 7.2.3, 7.2.3.1, Table 7-1.

6. Claim 26

Independent claim 26 recites every element of claim 20 except "and wherein the timestamp accounts for delays due to a busy signal on a medium access protocol," and adds the limitation "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer, wherein the receiver counter commences a synchronizing count sequence beginning at the adjusted value." As shown above, the accused products do not satisfy

all limitations of claim 20 under the adopted claim constructions, and therefore do not satisfy all limitations of claim 26. The record evidence does show, however, that the accused products satisfy the additional limitation of claim 26, "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer, wherein the receiver counter commences a synchronizing count sequence beginning at the adjusted value."

i. 802.11

The 802.11 Standard requires that for Respondents' products the received "timestamp value shall be adjusted by adding an amount equal to the receiving STA's delay through its local PHY components plus the time since the first bit of the timestamp was received at the MAC/PHY interface." CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.4; CX-1596C (Negus WS) at Q&A 384. After circuitry within a STA performs the step of adjusting the received timestamp value, the 802.11 standard further mandates that "the STA's TSF timer shall then be set to the adjusted value of the timestamp." CX-1596C (Negus WS) at Q&A 385; CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.4.

ii. Ralink

[

., CX-0561C (Ralink Source Code) at 837RALINK_SC0000023-25,34-36,43; CX-1596C

CX-0561C ; CX-1596C

]

iii. Realtek

Realtek's [ ] chips comprise a structure described by the module [

] CX-1596C (Negus WS) at Q&A 389.

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002195-96; CX-1596C (Negus WS) at Q&A 389. [ ] chips further comprise a structure described by the module [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002195-96; CX-1596C (Negus WS) at Q&A 389.

Realtek's [ ] chips comprise a structure described by the module [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002418-19; CX-1596C (Negus WS) at Q&A 390. [ ] chips further comprise a structure described by the module [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002418-19; CX-1596C (Negus WS) at Q&A 390.

Realtek's [ ] chips comprise structures described by the modules [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00000606-8; CX-1596C (Negus WS) at Q&A 391. [ ] chips further comprise a structure described by the modules [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00000606-8; CX-1596C (Negus WS) at Q&A 391.

iv. Funai

For those of Funai's products that interoperate with 802.11 standards devices and contain at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Ralink's chips or Realtek's chips, and is inherently met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 392.

7. Claim 27

The record evidence shows that the accused products do not satisfy all limitations of claim 27.

a. The receiver of claim 26, further comprising:

As shown above, the accused products do not satisfy all limitations of asserted claim 26 under the adopted claim constructions.

b. circuitry for commencing the synchronizing count sequence after the transmission signal is completely received.

If Complainants' proposed claim constructions were adopted, the evidence shows that the accused products would satisfy the additional limitation of claim 27.

i. 802.11

The 802.11 Standard mandates that "All STAs shall be able to validate every received frame using the frame check sequence (FCS) and to interpret certain fields from the MAC headers of all frames." CX-0116C (802.11 Standard, Jun. 2007) at §§ 7, 7.1. The "FCS" is transmitted last in time for any "Beacon frame" and, therefore, this mandated behavior for Respondents' products requires that a "Beacon frame" (or "transmission signal") be "completely received" prior to synchronization because only complete reception can enable an FCS validation. Without such validation, STAs cannot reliably determine if a particular transmission is a "Beacon frame" or what the contents of fields within the "Beacon frame" are comprised of. *See* CX-0116C (802.11 Standard, Jun. 2007) at §§ 7.2.3, 7.2.3.1; CX-1596C (Negus WS) at Q&A 394. Circuitry for commencing the synchronizing count sequence after the transmission signal is completely received is also explicitly required in the 802.11 Standard by the text "Upon receiving a Beacon frame with a valid FCS and BSSID or SSID, as described in 11.1.2.3, a STA shall update its TSF timer." CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.4; CX-1596C (Negus WS) at Q&A 395.

ii. Ralink

[

CX-1596C

CX-0561C

JX-0014C ; CX-1596C .]

iii. Realtek

Realtek's chips, [ ] comprise a structure described by the module [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002613-16,2763-67,2997-3000; CX-1596C (Negus WS) at Q&A 398. [

]

CX-1596C (Negus WS) at Q&A 399. Realtek's chips further comprise structure [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002613-16, REA837ITC-SC-00002569,75-76, REA837ITC-SC-00002997-3000, REA837ITC-SC-00002944-45,51; CX-1596C (Negus WS) at Q&A 399. [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00002190-96, REA837ITC-SC-00002410-20, REA837ITC-SC-00000620-27, REA837ITC00025078; CX-1596C (Negus WS) at Q&A 399.

iv. Funai

For those of Funai's products that interoperate with 802.11 standards devices and contain at least one of Ralink's chips or Realtek's chips, this limitation is met by structure within Ralink's chips or Realtek's chips and inherently is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 400.

8. Claim 28

The record evidence shows that the accused products do not satisfy all limitations of claim 28.

a. The receiver of claim 27,

As shown above, the accused products do not satisfy all limitations of asserted claim 27 under the adopted claim constructions.

b. further comprising circuitry for commencing the synchronizing count sequence after a CRC data in the received transmission signal is checked.

If Complainants' proposed claim constructions were adopted, the evidence shows that the accused products would satisfy the additional limitation of claim 28.

"CRC data check" and "FCS" in 802.11 are interchangeable. *See*, *e.g.*, CX-0116C (802.11 Standard, Jun. 2007) at § 7.1.3.7; CX-1596C (Negus WS) at Q&A 401. Accordingly, the evidence described above relating to dependent claim 27 applies equally to the limitation described in claim 28.

9. Claim 29

The record evidence shows that the accused products do not satisfy all limitations of claim 29.

a. The receiver of claim 26,

As shown above, the accused products do not satisfy all limitations of asserted claim 26 under the adopted claim constructions.

b. further comprising an adder for adding a compensation factor to the value at which the count sequence begins.

If Complainants' proposed claim constructions were adopted, the evidence shows that the Ralink products would satisfy the additional limitation of claim 29.

i. 802.11

The 802.11 standard specifically requires that the "received timestamp value shall be adjusted by adding an amount." CX-1596C (Negus WS) at Q&A 402. This added "amount" is a "compensation factor" and the 802.11 requirement for "adding" indicates that the circuitry for adjusting the timestamp may comprise at least one "adder." *Id.*

ii. Ralink

[

CX-0561C ; CX-1596C

]

iii. Realtek

Complainants argue that Realtek's chips comprise [

] *See*,

e.g., CX-0298C (Realtek Source Code) at REA837ITCSC-00000620-27, 2195-96, 2418-20; CX-1596C (Negus WS) at Q&A 404.

The record evidence shows, however, that the accused Realtek products [ ] RX-2811C (Vojcic WS) at Q&A 271-73. The Realtek products [ ] *Id.* [ ] *Id.*

iv. Funai

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips, this limitation is met by structure within Ralink's chips, and this limitation is met inherently by structure within Funai's products. CX-1596C (Negus WS) at Q&A 405. Inasmuch as Realtek's chips do not satisfy the "adder" limitation, the Funai products incorporating Realtek's chips also do not satisfy this limitation.

10. Claim 30

The record evidence shows that the accused products do not satisfy all limitations of claim 30.

a. The receiver of claim 29,

As shown above, the accused products do not satisfy all limitations of asserted claim 29 under the adopted claim constructions.

b. wherein the compensation factor compensates for propagation delay at the receiver.

If Complainants' proposed claim constructions were adopted, the evidence shows that the accused products would satisfy the additional limitation of claim 30.

i. 802.11

The 802.11 Standard specifically requires that the "received timestamp value shall be adjusted by adding an amount equal to the receiving STA's delay through its local PHY components plus the time since the first bit of the timestamp was received at the MAC/PHY interface." CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.4; CX-1596C (Negus WS) at Q&A 406. This "amount equal to the receiving STA's delay" is a reference to a "compensation factor" that "compensates for propagation delay at the receiver." CX-1596C (Negus WS) at Q&A 406.

ii. Realtek

Realtek's chips comprise [

] *See*, *e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00000620-27,2195-96,2418-20; CX-1596C (Negus WS) at Q&A 408.

iii. Funai

For those of Funai's products that interoperate with 802.11 standards devices and contain at least one of Realtek's chips, this limitation is met by structure within Realtek's chips and

inherently is met by structure within such Funai products. CX-1596C (Negus WS) at Q&A 409.[56]

11. Claim 31

The record evidence shows that the accused products do not satisfy all limitations of claim 31.

a. The receiver of claim 29,

As shown above, the accused products do not satisfy all limitations of asserted claim 29 under the adopted claim constructions.

b. wherein the compensation factor allows for time taken to process the transmission signal at the receiver.

If Complainants' proposed claim constructions were adopted, the evidence shows that the Ralink products would satisfy the additional limitation of claim 31.

i. 802.11

The 802.11 standard specifically requires that the "received timestamp value shall be adjusted by adding an amount equal to the receiving STA's delay through its local PHY components plus the time since the first bit of the timestamp was received at the MAC/PHY interface." CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.4; CX-1596C (Negus WS) at Q&A 410.

ii. Ralink

[

[56] It has not been shown that Ralink chips, or the Funai products that incorporate Ralink chips, satisfy this claim limitation. *See* Compls. Br. at 495.

CX-0561C

; CX-1596C

JX-0014C

.]

iii. Realtek

Complainants argue that Realtek's chips comprise [

] *See, e.g.*, CX-0298C (Realtek Source Code) at REA837ITC-SC-00000620-27,2195-96,2418-20; CX-1596C (Negus WS) at Q&A 413.

The record evidence, however, shows that Realtek's chips do not satisfy this claim limitation. The '867 specification describes two ways to update the receiver counter. JX-0005 ('867 patent) at col. 6, lns. 7-32. In the first method, the timestamp is buffered in a counter register until the TIM packet is processed completely, and in the second method a "processing compensation factor" is loaded directly into the receiver counter so that an intermediate counter register is not required. *Id.* at col. 6, lns. 9-11; col. 6, lns. 26-32; RX-2811C (Vojcic WS) at

Q&A 274-75. Claims 31 and 56 are directed to the "processing compensation factor" of the second method, [ ] *Id.*

iv. Funai

For those of Funai's products that interoperate with 802.11 standards devices and comprise at least one of Ralink's chips, this limitation is met by structure within Ralink's chips and inherently is met by structure within Funai's products. CX-1596C (Negus WS) at Q&A 414. For those Funai products that incorporate Realtek's chips, this claim limitation is not satisfied. *See* RX-2811C (Vojcic WS) at Q&A 274-75.

12. Claim 32

The record evidence shows that the accused products do not satisfy all limitations of claim 32. Dependent claim 32 recites, "[t]he receiver of claim 26, wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal." It has been shown above that the accused products do not satisfy all limitations of claim 26 under the adopted claim constructions. Moreover, as discussed above with respect to claim 20, the timestamp does not account for delays in transmitting the signal. Therefore, the accused products do not satisfy this additional limitation of claim 32.

13. Claim 33

The record evidence shows that the accused products do not satisfy all limitations of claim 33. Dependent claim 33 recites, "[t]he receiver of claim 26, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol." It has been shown above that the accused products do not satisfy all limitations of claim 26 under the adopted claim constructions. Moreover, as discussed above with respect to claim 20, the timestamp does not

account for delays due to a busy signal. Therefore, the accused products do not satisfy this additional limitation of claim 33.

14. Claim 34

The record evidence shows that the accused products do not satisfy all limitations of claim 34.

a. A receiver, comprising:

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

b. a receiver counter that counts up to n counts, and

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

c. a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a traffic pending field and a timestamp field the traffic pending field including data indicating stations for which the transmitter has data buffered,

Claim 34 recites "a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a traffic pending field and a timestamp field the traffic pending field including data indicating stations for which the transmitter has data buffered." For an analysis of this claim limitation, refer to the corresponding discussions for claims 20 (radio modem) and 23 (traffic pending field).

d. the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer

Claim 34 recites "the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a

value m within a count sequence of the transmitter timer." For an analysis of this limitation, refer to the corresponding discussion for claim 20.

e. at the time of transmission of the transmission signal.

Claim 34 recites "at the time of transmission of the transmission signal." This claim limitation is construed to mean "at the beginning of the transmission of the packet." Complainants' proposed construction, which was not adopted, is "when the transmission signal is transmitted."

The record evidence shows that the accused Funai and Realtek products do not infringe this limitation under either construction, because [

] RX-2811C (Vojcic WS) at Q&A 257-59.

With respect to the Ralink chips, the evidence shows that [

] CX-1596C (Negus WS) at Q&A 423-27. Accordingly, it is determined that the Ralink chips, as well as the Funai products that incorporate these chips, satisfy this additional limitation of claim 34.

15. Claim 35

The record evidence shows that the accused products do not satisfy all limitations of claim 35.

a. The receiver of claim 34,

As shown above, the accused products do not satisfy all limitations of asserted claim 34 under the adopted claim constructions.

b. wherein the transmission signal further includes a timer interval field, and-the timer interval field includes timer interval data indicating an interval between periodic transmissions of transmission signals including traffic pending field.

The accused Funai and Realtek products do not satisfy this limitation because the '867 specification defines "timer interval field" as "the value of n of the modulo n counter in the transmitter," and the accused timer interval field is not that value. *See* JX-0005 ('867 patent) at col. 5, lns. 5-6; RX-2811C (Vojcic WS) at Q&A 277-81; RX-2813C (Heegard RWS) at Q&A 485-87, Q&A 511-12.

If, however, Complainants' proposed construction for the term '"timer interval field" were adopted, the record evidence demonstrates that the accused products would satisfy this claim limitation. The following section sets forth this evidence showing satisfaction of this limitation under the alternate claim construction.

i. 802.11 – Analysis Under Alternate Construction

As discussed above, the schedule period between Beacon frames is defined by "the dot11BeaconPeriod attribute within the AP." CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.1; CX-1596C (Negus WS) at Q&A 432. This defines a series of TBTTs, or "target beacon transmission times," "exactly dot11BeaconPeriod TUs apart." *Id.*; CX-0116C (802.11 Standard, Jun. 2007) at § 4. The TBTTs define the "timer interval" between periodic transmissions of transmission signals. CX-1596C (Negus WS) at Q&A 433.

The Beacon frame includes a field that indicates this scheduled time between Beacon frames. The "Beacon frame" ("transmission signal") specifically includes a "Beacon Interval field" which "represents the number of time units (TUs) between target beacon transmission times (TBTTs)." CX-0116C (802.11 Standard, Jun. 2007) at § 7.3.1.3; CX-1596C (Negus WS)

at 142, Q&A 434. Respondents' products [ ] CX-1596C (Negus WS) at Q&A 435; CX-0116C (802.11 Standard, Jun. 2007) at § 11.1.2.1 ("STAs shall adopt that beacon period when joining the BSS.").

ii. Doctrine of Equivalents

In addition to arguing literal infringement of this claim limitation under Complainants' proposed construction, Complainants also allege that the accused products satisfy this claim limitation under the doctrine of equivalents in the event Respondents' proposed construction is adopted. *See* Compls. Br. at 490-91. Complainants' doctrine of equivalents argument is not persuasive, however, because during prosecution the applicants told the USPTO that "the two counters 22 and 58 remain in synchronization as they cyclically count up to value n." RX-2811C (Vojcic WS) at Q&A 278-81; RDX-2811.0088; RX-1165 (file history of '661 application) at 80, 105, 132. The applicants surrendered timer interval fields that are not both the timer interval and the value of n of the modulo n counters in the receiver and transmitter.

The claimed and the accused "timer interval field" are also substantially different. RX-2811C (Vojcic WS) at Q&A 278-81. The function of the accused timer interval field [ ] but the claimed timer interval field provides both the interval and the maximum value of the count sequence in the counters in the receiver and transmitter timer so that the receiver knows the exact time to wake up. *Id.* at Q&A 279. The accused receiver [ ] but the claimed receiver knows the precise wake-up time, *i.e.*, n. *Id.* at Q&A 280. The result of the accused timer interval field [

] which is different from the claimed receiver, which wakes up precisely at time n to minimize power consumption. *Id.* at Q&A 281.

16. Claim 37

The record evidence shows that the accused products do not satisfy all limitations of claim 37. Dependent claim 37 recites, "[t]he receiver of claim 35, wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal." It has been shown above that the accused products do not satisfy all limitations of claim 35 under the adopted claim constructions. For a discussion of the additional "timestamp" limitation of claim 37, refer to the corresponding analysis with respect to claim 20.

17. Claim 38

The record evidence shows that the accused products do not satisfy all limitations of claim 38. Dependent claim 38 recites, "[t]he receiver of claim 35, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol." It has been shown above that the accused products do not satisfy all limitations of claim 35 under the adopted claim constructions. For a discussion of the additional "timestamp" limitation of claim 38, refer to the corresponding analysis with respect to claim 20.

18. Claim 39

The record evidence shows that the accused products do not satisfy all limitations of claim 39. Dependent claim 39 recites, "[t]he receiver of claim 34, wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal." It has been shown above that the accused products do not satisfy all limitations of claim 34 under the adopted claim constructions. For a discussion

of the additional "timestamp" limitation of claim 39, refer to the corresponding analysis with respect to claim 20.

19. Claim 40

The record evidence shows that the accused products do not satisfy all limitations of claim 40. Dependent claim 40 recites, "[t]he receiver of claim 34, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol." It has been shown above that the accused products do not satisfy all limitations of claim 34 under the adopted claim constructions. For a discussion of the additional "timestamp" limitation of claim 40, refer to the corresponding analysis with respect to claim 20.

20. Claim 47

Independent claim 47 includes all elements of independent claim 34 except the "traffic pending field" limitations. It has been shown above that the accused products do not satisfy the claim limitations of claim 34, notwithstanding the "traffic pending field" limitations of that claim. Therefore, for the same reasons discussed with respect to claim 34, the accused products do not satisfy all limitations of claim 47.

21. Claim 49

The record evidence shows that the accused products do not satisfy all limitations of claim 49.

a. A wireless local area network receiver, comprising:

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

b. a receiver timer that counts up to n counts, and

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

c. a radio modem capable of periodically receiving a transmission signal from a transmitter, the transmission signal including a timestamp

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

d. for synchronizing the receiver timer with a transmitter timer that counts up to n counts, the timestamp being a value m

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

e. which accounts for a delay between a start of a process to transmit the transmission signal from the transmitter and an actual time of transmitting the transmission signal,

For an analysis of this claim limitation, refer to the corresponding discussion for asserted claim 20.

f. wherein the receiver retrieves the timestamp and the receiver timer commences a count sequence based on the value m as to synchronize the receiver timer with the transmitter timer.

Claim 49 of the '867 patent recites, "the receiver timer commences a count sequence based on the value m," as distinguished from other claims that recite commencing a count sequence beginning at an "adjusted value," *e.g.*, claim 26. *See* RX-2811C (Vojcic WS) at Q&A 260. Thus, a person of ordinary skill would interpret the "receiver timer" in claim 49 to commence at "value m," and not an "adjusted value." *Id.* The accused timer in the accused products [ ] and thus does not satisfy this limitation of claim 49. *Id.*; RX-2813C (Heegard RWS) at Q&A 498, Q&A 505-06.

22. Claim 50

The record evidence shows that the accused products do not satisfy all limitations of claim 50. Dependent claim 50 recites, "[t]he receiver of claim 49, wherein the timestamp accounts for delays in a modem of the transmitter." It has been shown above that the accused products do not satisfy all limitations of claim 49 under the adopted claim constructions. For a discussion of the additional "timestamp" limitation of claim 49, refer to the corresponding analysis with respect to claim 20.

23. Claim 51

The record evidence shows that the accused products do not satisfy all limitations of claim 51. Dependent claim 51 recites, "[t]he receiver of claim 49, wherein the timestamp accounts for delays due to a busy signal on a medium access protocol." It has been shown above that the accused products do not satisfy all limitations of claim 49 under the adopted claim constructions. For a discussion of the additional "timestamp" limitation of claim 49, refer to the corresponding analysis with respect to claim 20.

24. Claim 52

The record evidence shows that the accused products do not satisfy all limitations of claim 52. Dependent claim 52 recites, "[t]he receiver of claim 49, wherein the receiver timer commences a synchronizing count sequence beginning at a value based on the timestamp." It has been shown above that the accused products do not satisfy all limitations of claim 49 under the adopted claim constructions. For a discussion of the additional limitation of claim 49, refer to the corresponding analysis with respect to claim 26.

25. Claim 53

The record evidence shows that the accused products do not satisfy all limitations of claim 53. Dependent claim 53 recites, "[t]he receiver of claim 52, further comprising circuitry for adjusting the value at which the count sequence begins." It has been shown above that the accused products do not satisfy all limitations of claim 52 under the adopted claim constructions. For a discussion of the additional limitation of claim 52, refer to the corresponding analysis with respect to claim 26.

26. Claim 54

The record evidence shows that the accused products do not satisfy all limitations of claim 54. Dependent claim 54 recites, "[t]he receiver of claim 53, further comprising an adder for adding a compensation factor to the value at which the count sequence begins." It has been shown above that the accused products do not satisfy all limitations of claim 53 under the adopted claim constructions. For a discussion of the additional "adder" limitation of claim 54, refer to the corresponding analysis with respect to claim 29.

27. Claim 55

The record evidence shows that the accused products do not satisfy all limitations of claim 55. Dependent claim 55 recites, "[t]he receiver of claim 54, wherein the compensation factor compensates for propagation delay at the receiver." It has been shown above that the accused products do not satisfy all limitations of claim 54 under the adopted claim constructions. For a discussion of the additional limitation of claim 55, refer to the corresponding analysis with respect to claim 30.

28. Claim 56

The record evidence shows that the accused products do not satisfy all limitations of claim 56. Dependent claim 56 recites, "[t]he receiver of claim 54, wherein the compensation factor allows for time taken to process the transmission signal at the receiver." It has been shown above that the accused products do not satisfy all limitations of claim 54 under the adopted claim constructions. For a discussion of the additional limitation of claim 56, refer to the corresponding analysis with respect to claim 31.

29. Claim 58

The record evidence shows that the accused products do not satisfy all limitations of claim 58. Dependent claim 58 recites, "[t]he receiver of claim 49, further comprising circuitry for commencing the synchronizing count sequence after the transmission signal is completely received." It has been shown above that the accused products do not satisfy all limitations of claim 49 under the adopted claim constructions. For a discussion of the additional limitation of claim 49, refer to the corresponding analysis with respect to claim 27.

30. Claim 59

The record evidence shows that the accused products do not satisfy all limitations of claim 59. Dependent claim 59 recites, "[t]he receiver of claim 58, further comprising circuitry for commencing the synchronizing count sequence after a CRC data in the received transmission signal is checked." It has been shown above that the accused products do not satisfy all limitations of claim 58 under the adopted claim constructions. For a discussion of the additional limitation of claim 59, refer to the corresponding analysis with respect to claim 28.

31. Claim 60

The record evidence shows that the accused products do not satisfy all limitations of claim 60. Dependent claim 60 recites, "[t]he receiver of claim 49, wherein the transmission signal further includes a traffic pending field that indicates stations for which the transmitter has data buffered." It has been shown above that the accused products do not satisfy all limitations of claim 49 under the adopted claim constructions. For a discussion of the additional limitation of claim 60, refer to the corresponding analysis with respect to claim 23.

32. Claim 61

The record evidence shows that the accused products do not satisfy all limitations of claim 61. Dependent claim 61 recites, "[t]he receiver of claim 60, wherein the transmission signal further includes a timer interval field, and the timer interval field includes timer interval data indicating an interval between periodic transmissions of transmission signals including traffic pending fields." It has been shown above that the accused products do not satisfy all limitations of claim 60 under the adopted claim constructions. For a discussion of the additional "timestamp" limitation of claim 61, refer to the corresponding analysis with respect to claim 35.

33. Funai / [ ] Products

In a separate section of their post-hearing brief, Complainants argue that Funai products that contain chips sourced from [ ] infringe the asserted claims of the '867 patent by virtue of their implementation of 802.11 functionality. *See* Compls. Br. at 595-96, 597. Complainants provide the following table that purports to list the Funai products accused of infringing the '867 patent that contain an [ ] chip, as well as relevant documentation showing 802.11 compatibility:

Product Number	Funai Model Number	WiFi Chip	Documentation Showing 802.11 Compatibility
[			CX-0994C ([1] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
			CX-0994C ([ ] Datasheet) at 1
		]	CX-0994C ([ ] Datasheet) at 1

Compls. Br. at 595-96.

With respect to these products, Complainants argue:

> The [ ] Chips claims compliance or interoperability with the IEEE 802.11b, 802.11g, or 802.11n standards. CX-0994C at 1. The datasheet for the [ ], which was products by [ ] in response to a subpoena in this investigation, clearly states that [
>
>]" *See*, for example, CX-0994C at 1, 30, 32, 35, 117. Products that claim compliance or compatibility with any of the IEEE 802.11 standards are, at minimum, more likely than not, and indeed highly likely, to infringe at least at least Claims 20, 23-24, 26-28, 32-35, 37-40, 47, 49-52, and 58-61 of the '867 Patent. CX-1643C (Negus Rebuttal Witness Statement) at 4, Q&A 11; 8, Q&A 42. Indeed, HDL code for numerous such products from Ralink and Realtek in this case demonstrates that the limitations of the asserted claims of the '867 Patent were met by all such products that claimed to have STA capability in

> compliance or interoperable with any of the IEEE 802.11 standards. *See* Section 6.B, *supra*.
>
> Accordingly, Funai Products that incorporate the [ ] Chip are highly likely to infringe Claims 20, 23-24, 26-28, 32-35, 37-40, 47, 49-52, and 58-61 of the '867 Patent. CX-1643C (Negus Rebuttal Witness Statement) at 4, Q&A 11; 8, Q&A 42.

Compls. Br. at 597.

Complainants have not adduced evidence to show that the Funai/[ ] products in question infringe the '867 patent. As an initial matter, the administrative law judge denied Complainant's motion to supplement the expert report of Dr. Negus to include infringement opinions related to the Funai/[ ] products. Order No. 84 (Mar. 28, 2013). The administrative law judge also granted Respondents' motion to strike portions of Dr. Negus' witness statement that opined on the alleged infringement of the Funai/[ ] products. Order No. 85, at 4 (Mar. 29, 2013). Accordingly, Complainants' infringement arguments are not supported by expert testimony.

Complainants instead generally allege, without evidentiary support, that these products are "more likely than not" and "highly likely" to infringe the asserted claims. *See* Compls. Br. at 597. Such a statement is not enough to prove that the Funai/[ ] products practice all elements of the asserted '867 claims. Therefore, it is determined that Complainants have not shown that the Funai/[ ] products infringe the asserted claims of the '867 patent.

D. Validity

1. Priority Date

The '867 patent matured from U.S. Patent Application No. 10/092,295 ("the '295 application"), which is a continuation of U.S. Patent Application No. 08/155,661 ("the '661 application"), which was filed on Nov. 22, 1993. The '867 Patent is entitled to a priority date of

no later than Mar. 6, 1993 based on Great Britain Patent Application No. 9304622 ("the '622 application"). *See* JX-0005.

Respondents argue that the '867 patent is not entitled to the claimed 1993 priority date because "the applicant allowed the '661 application to go abandoned before filing the '867 application." Resps. Br. at 136 (citing RX-1165 ('661 patent application) at RX-1165.0233). It is argued that "[t]he '867 patent would only be entitled to this earlier priority date if the '661 application was still pending (*i.e.*, not abandoned) when the '867 application was filed on March 7, 2002." *Id.* (citing 35 U.S.C. § 120).

Respondents' argument is not persuasive, however, inasmuch as the prosecution history of the '661 and '295 applications confirms that the '661 application was pending when the '295 application was filed. Respondents assert that the '661 application was abandoned on December 7, 2001, six months after a PTO rejection dated June 7, 2001. *See* Resps. Br. at 136. The record shows, however, that the PTO granted an extension of time to respond on December 7, 2001, and a Notice of Appeal was filed that same day. RX-1165 ('661 file history) at 224-225. The file wrapper contains another extension of time dated March 7, 2002, the day the '867 patent was filed. RX-1165 ('661 file history) at 227. The PTO issued a Notice of Abandonment over a year later on October 27, 2003. *Id.* at 233. The '295 application claimed priority to the '661 application and the '622 application from the outset. JX-0006 ('867 file history) at 37, 44. In its Notice of Allowability for the '867 patent, the PTO acknowledged the claim of foreign priority and indicated that certified copies of the required priority documents had been received. *Id.* at 187. Thus, the priority date of the asserted claims of the '867 patent is March 6, 1993.

2. Anticipation

The evidence adduced by Respondents has not shown, clearly and convincingly, that any prior art reference anticipates the asserted claims of the '867 patent.

a. European Patent No. 0615363 ("Diepstraten European Patent")

European Patent No. 0615363 to Diepstraten was published on September 14, 1994, and does not qualify as prior art to the '867 patent, inasmuch as it was determined above that the '867 patent is entitled to a priority date of March 6, 1993. *See* RX-0299 (EP 0615363B1). Therefore, the Diepstraten European Patent does not anticipate the asserted claims of the '867 patent.

b. Motorola WIN/White

Respondents argue that the system identified as "Motorola WIN/White" anticipates the asserted claims of the '867 patent.[57] Resps. Br. at 192-205. Motorola WIN/White is directed to a wireless in-building telecommunications system for voice and data communications using a TDMA protocol. CX-1641C (Katti RWS) at Q&A 494. Motorola WIN/White is a wireless packet TDMA system with a "plurality of time slots allocated for different users or purposes," and notes that synchronization is important so that a "receiving terminal" is "able to properly correlate the beginning of each frame," and that using a "timestamp" is known for such purposes. RX-0421 (White '482) at col. 1, lns. 55-62. Thus, Motorola WIN/White discloses a TDMA system, not a CSMA system. CX-1641C (Katti RWS) at Q&A 496.

One of the issues Motorola WIN/White addresses is the "need for an improved method for maintaining time synchronization in a wireless TDMA packet network in which multiple

[57] It is undisputed that Motorola WIN/White constitutes prior art to the asserted '867 claims. *See* CX-1641C (Katti RWS) at Q&A 485-547.

antennas are utilized" in order to solve synchronization problems specifically directed to "a wireless TDMA packet network in which different directional antennas are used for communications." RX-0421 (White '482) at col. 2, lns. 7-13. A person of ordinary skill in the art would understand TDMA to be a system where a central controller, called a "CM" in White, allocates access to the media on a repeating and deterministic basis for all of the terminals, each called a "UM" in Motorola WIN/White, in the network. CX-1641C (Katti RWS) at Q&A 498.

In the specific configuration of a directional antenna TDMA network disclosed in the Motorola WIN/White, each radio has 6 antennas so that communications between radios can occur in any one of 36 different combinations. RX-0421 (White '482) at Fig. 25, col. 16, lns. 52-63. Accordingly, the fundamental synchronization problem that Motorola WIN/White is addressing is stated as "[t]he use of different directional antennas complicates the problem of maintaining relative time synchronization between each of the UMs and the CM. RX-0421 (White '482) at col. 17, lns. 17-23. Since the UMs and CM each communicate using only one selected antenna at any given time, it cannot be assumed that each UM will receive synchronization signals or information transmitted by the CM using a particular CM antenna. CX-1641C (Katti RWS) at Q&A 499. The purported novelty of Motorola WIN/White is the use of "byte counters" in both the CM and UM wherein the value of the CM "byte counter" is transmitted at pre-determined "byte count" positions as a time stamp "TX_TIMESTAMP" in "frame sync packets" over antennas "A1, A3, and A5" for "odd" frame counts and antennas "A2, A4, and A6" on "even" frame counts. RX-0421 (White '482) at col. 17, lns. 31-52. The UM then attempts to receive on a particular UM antenna all "frame sync packets" from which the best choice of CM antenna for a particular UM at that time can be found and communicated back to the CM through techniques unrelated to synchronization, and timing synchronization of the

UM "byte counter" can be performed based partially on information in the "time stamp." CX-1641C (Katti RWS) at Q&A 502.

The positions in the CM "byte counter" for the time stamps can be determined in advance because this system is not subject to medium access delays. *Id.* at Q&A 503. Further, the TX_TIMESTAMP" is different from the timestamp in the '867 patent because it is not the value of the "byte counter" at the time of transmission of the time stamp. RX-0421 (White '482) at col. 18, lns. 3-18; CX-1641C (Katti RWS) at Q&A 504. Rather, the "TX_TIMESTAMP" represents the value in the byte counter relative to the start of the frame. *Id.* at Q&A 505.

The teachings of Motorola WIN/White are therefore in direct contrast with the teachings and asserted claims of the '867 patent. *Id.* at Q&A 508. Claim elements of the '867 patent that are missing from White include: (1) a timestamp that represents a value within a count sequence of a transmitter time at the time of transmission, (2) adjusting a timestamp and hence commencing a count at an adjusted timestamp, (3) using a compensation factor that allows for time taken to process the transmission signal, (4) a traffic pending field, (5) a timer interval field, and (6) accounting for delays due to a busy signal on a medium access protocol. *Id.* at Q&A 510.

Specifically with respect to the timestamp limitation, although Motorola WIN/White does show an operation to calculate a "compensation value OFFSET" that is used to restart the "UM frame byte counter," this operation is not an adjustment to the "retrieved timestamp" as claimed in the '867 patent. *Id.* at Q&A 511.

Motorola WIN/White does not disclose the limitation "timestamp field" as that term is used in all asserted claims of the '867 patent. *Id.* at Q&A 512. As discussed above, the "TX_TIMESTAMP" of White is not equivalent to the "timestamp field" of the '867 patent at

least because the "TX_TIMESTAMP" does not meet the limitation within the claim element of being a count value "at the time of the transmission." *Id.* In addition, this limitation is directed to the incorporation of the effects of delays in the transmitter and delays due to a busy signal on the medium. *Id.* Neither delay is accounted for by the TX_TIMESTAMP in White. *Id.* In fact, no such "busy signal" delays exist because Motorola WIN/White is a TDMA system. *Id.*

Motorola WIN/White does not disclose the claim element "the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer [at the time of transmission of the transmission signal]" or similar limitations as used in the '867 patent. *Id.* at Q&A 519. As discussed above, the "TX_TIMESTAMP" referred to in White is not a "timestamp" within the meaning of the '867 patent because it is not the value of the "byte counter" at the time of transmission of the time stamp within the "frame sync packet." *Id.* The TX_TIMESTAMP "reflects a time X bytes after the start of the packet 1846 since Y bytes of buffering are utilized prior to the actual transmission of each byte, i.e. Y bytes are prefetched in preparation for transmission of each byte." RX-0421 (White '482) at col. 18, lns. 12-16; CX-1641C (Katti RWS) at Q&A 520-21. The TX_TIMESTAMP is an independent value reflecting a prefetched number of bytes and not the value of a counter in a transmitter timer. *Id.*

Motorola WIN/White does not disclose the claim element "wherein the timestamp accounts for delays due to a busy signal on a medium access protocol" as used in the '867 patent. *Id.* at Q&A 522. Motorola WIN/White discloses a TDD (Time Division Duplex) system, which is a variation on TDMA. *Id.* at Q&A 523. Such a system does not have a "busy signal on a medium access protocol." *Id.* As discussed above, the problem of a busy signal on a medium

access protocol is not a feature in TDMA systems because transmission times are predetermined. *Id.* Specifically, the positions of the CM "byte counter" in White for the time stamps can be determined in advance because this system is not subject to medium access delays. *Id.* Moreover Respondents' expert Dr. Heegard testified that the "busy signal" in the '867 patent is defined only in relation to CSMA systems and has no analogy in TDMA systems. Heegard Tr. 993-994, 996-997. Consistent with Dr. Heegard's testimony that the "busy signal" of the '867 patent does not appear in any TDMA system, there is nothing in the record demonstrating that the timestamp transmitted by the WIN system accounts for delays due to a "busy signal."

The evidence shows other important distinctions between the CSMA system of the '867 patent and the TDMA system of Motorola WIN/White as revealed by the testimony of Mr. Buchholz. In the Motorola WIN system, the device cannot sense whether the medium is "busy" and will send a request regardless of whether the medium is "busy" or not. Buchholz Tr. 935. The Motorola WIN system is thus fundamentally different from the CSMA framework of the '867 patent, and the concept of "busy signal" is absent. CX-1641C (Katti RWS) at Q&A 527.

This difference is significant because it confirms that the notion of a "delay" in accessing a medium is completely absent from Motorola WIN/White. *Id.* at Q&A 528. The CM in Motorola WIN/White never waits for the medium to be free before sending a signal. *Id.* Rather, it always sends a signal in its assigned timeslot. *Id.* If there is a collision and the CM is able to discern that there was a collision, it will send the signal again. *Id.* There is never a delay in accessing the medium, there is no busy signal, and thus there is no way for the alleged "timestamp" to account for such delays because there are no delays to account for. *Id.*

Motorola WIN/White does not disclose a "traffic pending field" as used in the '867 patent. *Id.* at Q&A 530. Mr. Buchholz's testimony confirms that no such disclosure appears in any document describing Motorola WIN/White. *Id.*; *see also* Buchholz Tr. 939.

Motorola WIN/White does not disclose the claim element "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer" as used in the '867 patent. CX-1641C (Katti RWS) at Q&A 533. Motorola WIN/White fails to disclose a timestamp in the context of the '867 patent and thus any limitation that includes "timestamp" is not disclosed in White. *Id.* White also specifically fails to disclose "adjusting" a timestamp as described above. *Id.*

Inasmuch as Motorola WIN/White fails to disclose a timestamp or circuitry for adjusting a timestamp, Motorola WIN/White also fails to disclose the following claim limitations which presume the presence of at least the "timestamp" limitation: "wherein the receiver counter commences a synchronizing count sequence at the adjusted value" or similar limitations as used in the '867 patent; "circuitry for commencing the synchronizing count sequence after the transmission signal is completely received" as used in the '867 patent; "circuitry for commencing the synchronizing count sequence after a CRC data in the received transmission signal is checked" as used in the '867 patent; "an adder for adding a compensation factor to the value at which the count sequence begins" or similar limitations as used in the '867 patent; "wherein the compensation factor compensates for propagation delay at the receiver" as used in the '867 patent; "wherein the compensation factor allows for time taken to process the transmission signal at the receiver" as used in the '867 patent; "wherein the receiver retrieves the timestamp" as used in the '867 patent; and "wherein the timestamp accounts for delays in a modem of the transmitter" as used in the '867 patent. *Id.* at Q&A 534-546.

Further, Motorola WIN/White does not disclose the claim element "wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal." *Id.* at Q&A 540. The "Y bytes" that Respondents identify as the delay are actually part of the signal transmission process. *Id.*; *see, e.g.*, Resps. Br. at 193-94. The Y bytes are predetermined because they are pre-fetched to buffer the packet. CX-1641C (Katti RWS) at Q&A 540. Thus, the "Y bytes" do not represent a "delay." There is no "delay" in the TDMA system of Motorola WIN/White as that term is used in the '867 patent. *Id.*

Finally, Motorola WIN/White does not discloses the claim element "wherein the transmission signal further includes a timer interval field, and the timer interval field includes timer interval data indicating an interval between periodic transmissions of transmission signals including traffic pending field." *Id.* at Q&A 542. Respondents have identified nothing in Motorola WIN/White that would meet this limitation. *Id.*

Therefore, it is determined that Respondents have not proved by clear and convincing evidence that Motorola WIN/White anticipates any asserted claim of the '867 patent.

c. U.S. Patent No. 5,052,029 ("James")

Respondents argue that U.S. Patent No. 5,052,029 to James (RX-1335) anticipates claims 20, 23, 24, 26, 29, 23, 33, 47, 49, 51, 52, 53, and 54 of the '867 patent. *See* Resps. Br. at 206-12; GR12 Filing at 21-22. It is undisputed that James is prior art to the '867 patent. *See* CX-1641C (Katti RWS) at Q&A 548-585.

James is directed to providing a synchronization signal for use on a wired communication interconnect. *Id.* at Q&A 554. In particular, James discloses a communication interconnect that connects multiple "units" such as "computers, peripheral devices, test equipment, or interfaces to

other types of equipment or communication interconnects." RX-1335 (James '029) at col. 2, lns. 40-44. The only specific "interconnect(s)" considered by James are wired media such as "printed circuit board trace, wire, coaxial cable, or optical media." *Id.* at col. 2, lns. 44-47.

The preferred embodiment in James is a "broadcast bus" that the "units" access through "bit-by-bit arbitration mechanism on a dominant-mode bus." *Id.* at col. 2, lns. 47-49; col. 3, lns. 18-20. "Bit-by-bit arbitration" in a wired system is fundamentally different from the type of communication disclosed in the '867 patent, in which devices communicate wirelessly and must wait for the medium to be free of busy signals. CX-1641C (Katti RWS) at Q&A 556. In contrast to the '867 patent, "bit-by-bit arbitration" involves the use of "arbitration bits" that are assigned to give certain "units" preferential bus access over other "units." *Id.*

In James, a "cycle master unit" is assigned an "arbitration number to insure it will obtain access to the interconnect" as soon as a fixed "long gap" of "absence of communications" by the "units" occurs following any already in progress bus activity at a "cycle synch point." RX-1335 (James '029) at Fig. 2, col. 3, lns. 41-54. The "cycle master unit" will always have access to the medium regardless of any other units after the "long gap" due to the "bit-by-bit arbitration." The cycle master unit's access to the medium is always deterministic and known in advance by the cycle master unit and other units. *See, e.g.*, *id.* at col. 13, lns. 29-36.

James is in direct contrast with the teachings and asserted claims of the '867 patent. *See* CX-1641C (Katti RWS) at Q&A 559. James does not disclose many of the asserted claim elements such as a timestamp field that represents a count sequence value at the time of transmission, adjusting a timestamp (and hence commencing a count at an adjusted timestamp), using a compensation factor for an adjustment, a radio modem, a traffic pending field, a timer interval field, or accounting for delays due to a busy signal on a medium access protocol. *Id.*

In particular, James does not disclose the "timestamp" limitation required in every asserted claim of the '867 patent. *Id.* at Q&A 560. The "time stamp" in James is an "absolute count of time" rather than a "count measured from the last cycle synch point." *Id.* at Q&A 561. The only mention of the "time stamp" in James is this single description. *Id.* James fails to disclose when within a "cycle start communication" the "time stamp," if present, would be transmitted. *Id.* James does not disclose whether this "time stamp" would contain the count value at the beginning of the "cycle start communication," the actual point of transmission of the "time stamp" (as done in the '867 patent asserted claims), or some other reference point. *Id.* at Q&A 562. This lack of disclosure is significant because the purpose of the "timestamp" in the '867 patent is to accurately reflect the value of the transmitter *timer at the time of transmission.* *Id.* at Q&A 563. Thus, the specific value represented by the timestamp relative to the transmitter timer is important. *Id.* In James, it is completely unclear what the "time stamp" represents, and therefore James cannot disclose the "timestamp" of the '867 patent. *Id.*

James likewise does not disclose the "adjusted timestamp" limitations in the '867 patent. *Id.* at Q&A 564. At best, James suggests that an "internal clock" within a "unit" could be adjusted gradually based on unspecified "time information." *Id.*; RX-1335 (James '029) at col. 4, lns. 20-24.

James is therefore fundamentally different from the system in the '867 patent. *Id.* at Q&A 565. James is directed toward wired computer bus interconnects in which all units are connected to one another. *Id.* This is different from the '867 patent, which discloses wireless local area networks where "stations" can only "communicate with each other via the access point." *Id.*

Complainants' expert Dr. Katti testified that a person of ordinary skill in the art attempting to overcome the deficiencies of prior art systems would specifically be motivated not to combine such references with any reference, including James, that was directed to synchronization on an wired interconnect bus using bit-by-bit arbitration access. *Id.* at Q&A 569.

James does not disclose "a radio modem capable of periodically receiving a transmission signal from a transmitter" as required by every asserted claim of the '867 patent. *Id.* at Q&A 566. The only communication disclosed in James is wired communication that does not use a radio modem. *Id.*

James does not disclose the claim element "the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter time, wherein the timestamp represents a value m within a count sequence of the transmitter timer" and similar elements as required by every asserted claim of the '867 patent. *Id.* at Q&A 572. The "time stamp" in James does not match the timestamp in the '867 patent for the reasons discussed above. Further, the "count of the cycle start delay" also does not correspond to the "timestamp" in the '867 patent. *Id.* at Q&A 573. It is not clear from James that the "cycle start delay" represents the value in a transmitter timer. *Id.* James refers to a "master clock," but does not state that the "cycle start delay" represents a value in the master clock. *Id.* James also does not disclose any other transmitter timer. *Id.* Accordingly, the "count of the cycle start delay" does not meet any party's proposed construction of "timestamp." *Id.*

James does not disclose the claim element "wherein the timestamp accounts for delays due to a busy signal on a medium access protocol" as explicitly required by the '867 patent and as implicit in the "timestamp" limitation. *Id.* at Q&A 574. The cycle start delay disclosed in

James equals a delay due to the cycle master unit waiting for the absence of communications on the interconnect among any of the units. *Id.* Nothing in James discloses "a busy signal on a medium access protocol," which Respondents' expert Dr. Heegard testified is unique to CSMA systems. *See id.* As discussed above, medium access in James is governed by "bit-by-bit arbitration," not by the absence of a CSMA busy signal on the medium. *Id.* Again, the deterministic, wired communication protocol of James is strikingly different from the wireless communication protocol of the '867 Patent where all transmissions are subject to unpredictable delays. *Id.* at Q&A 575.

James does not disclose the claim element "wherein the transmission signal further includes a header field, which is transmitted before the timestamp field and the traffic pending field" in the '867 patent. *Id.* at Q&A 576. The term "traffic pending field" in the '867 patent has a specific function of indicating for which stations data packets are buffered. *Id.* at Q&A 576; JX-0005 ('867 patent) at col. 5, lns. 7-8. Even if this is not an explicit, binding definition of "traffic pending field," it would be clear to one of skill in the art that the term "traffic pending field" includes specific information about data being buffered, stored, or transmitted. CX-1641C (Katti RWS) at Q&A 576. Respondents point to nothing in James that satisfies this description.

James does not disclose the claim element "wherein the header field includes type data indicating a type of the transmission signal" in the '867 Patent. *Id.* at Q&A 577. To the extent James discloses a header field, the "arbitration number and address" is not "type data indicating a type of the transmission signal." *Id.* The "arbitration number and address" in James identifies the priority of the signal and its destination, not its "type," and confirms that the medium access system of James is different from the CSMA system of the '867 patent. *Id.*

James does not disclose the claim element "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer" or similar limitations in the '867 Patent. *Id.* at Q&A 578. James suggests that the "internal clock" within a "unit" could be adjusted gradually based on unspecified "time information." *Id.* This is far from an enabling disclosure of "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins." *Id.*

James does not disclose the claim element "wherein the receiver counter commences a synchronizing count sequence beginning at the adjusted value" in the '867 patent because James fails to disclose circuitry for adjusting a value. *Id.* at Q&A 579.

James does not disclose the claim element "an adder for adding a compensation factor to the value at which the count sequence begins" in the '867 patent because Respondents have identified nothing in James that would meet this limitation. *See id.* at Q&A 580.

James does not disclose the claim element "wherein the timestamp accounts for a delay between a start of a process to transmit the transmission signal and an actual time of transmitting the transmission signal," and similar elements in the '867 patent. *Id.* at Q&A 581. James fails to disclose when within a "cycle start communication" the "time stamp," if present, would be transmitted or if this "time stamp" would contain the count value at the beginning of the "cycle start communication," the actual point of transmission of the "time stamp" as done in the '867 Patent asserted claims, or some other reference point. *Id.* Further, the "count of the cycle start delay" does not qualify as a "timestamp" for the reasons discussed above. *Id.*

James does not disclose the claim element "wireless local area network receiver" in the '867 patent. *Id.* at Q&A 582. To the extent the term "wireless local area network receiver" is limiting, this element is not disclosed in James. *Id.* As discussed above, James is limited to

wired applications, and a person of ordinary skill in the art would therefore not understand James to disclose any wireless applications, let alone a wireless local area network receiver. *Id.*

Respondents have not identified anything in James that would disclose the claim element "wherein the receiver retrieves the timestamp." *Id.* at Q&A 583.

James does not disclose the claim element "circuitry for adjusting the value at which the count sequence begins" in the '867 patent for the reasons described above with respect to the similar claim element. *Id.* at Q&A 5884.

Therefore, it is determined that Respondents have not shown that James anticipates the asserted claims of the '867 patent.

d. U.S. Patent No. 5,371,734 ("Fischer")

Respondents argue that that U.S. Patent No. 5,371,734 ("Fischer") anticipates asserted claims 20, 23-24, 26-28, 33-35, 38 and 40 of the '867 patent. *See* Resps. Br. at 215-17. Respondents do not substantively discuss Fischer in their post-hearing brief, however, and for this reason alone it is determined that Respondents have not proved anticipation. *See id.* Nevertheless, the record evidence also shows that Fischer does not disclose all limitations of the '867 claims identified above.

Fischer is directed to a MAC[58] technique in a wireless LAN[59] for selectively activating and deactivating transmitters and receivers to extend operation when battery powered. CX-1641C (Katti RWS) *Id.* at Q&A 590. The evidence shows that Fischer explicitly teaches away from the CSMA framework described in the '867 patent. *Id.* at Q&A 591.

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[58] "MAC" is an acronym for "medium access control."

[59] "LAN" is an acronym for "local area network."

Fischer identifies TDMA and CSMA as possible MAC protocols, highlighting the differences between TDMA and CSMA. *Id.* at Q&A 593; RX-0405 (Fischer '734) at col. 2, ln. 63 – col. 3, ln. 56. Fischer also identifies a third protocol, called Packet Reservation Multiple Access ("PRMA"), which is similar to TDMA. CX-1641C (Katti RWS) at Q&A 593; RX-0405 (Fischer '734) at col. 3, ln. 57 – col. 4, ln. 22. Fischer chooses a hybrid of TDMA and PRMA in order to avoid the "problems of avoiding collisions and saturation that affect CSMA." RX-0405 (Fischer '734) at col. 5, lns. 19-25. For these reasons, Fischer teaches away from the invention of the '867 patent, which is directed toward a CSMA system. CX-1641C (Katti RWS) at Q&A 594.

As in all TDMA-type systems, the communication cycles disclosed in Fischer are predetermined. *Id.* at Q&A 595. For example, Fischer states "[a]ll intervals of the communication cycle 70 take place within the limits of predesignated assigned times established by the hub." RX-0405 (Fischer '734) at col. 13, lns. 12-14. Fischer also discloses that

> [b]ecause all frames, both outbound and inbound, occur at predetermined times, the remotes 66 are able to determine in advance approximately when to expect frames transmitted from the hub and when to transmit frames to the hub. As a consequence of the predictable times when frames may be both received and transmitted, the remotes can power their radio interfaces down to preserve power at other times.

RX-0405 (Fischer '734) at col. 13, lns. 29-26.

Fischer is in direct contrast with the teachings and asserted claims of the '867 Patent. *See* CX-1641C (Katti RWS) at Q&A 598. Fischer fails to disclose several of the asserted claim elements, including (1) a timestamp field – and hence a timestamp that represents a count sequence value at the time of transmission, (2) adjusting a timestamp – and hence commencing a count at an adjusted timestamp, (3) using a compensation factor for an adjustment, and (4) a

timer interval field. *Id.* at Q&A 599. Basic elements within the '867 patent such as a "timestamp" that represents a "count sequence" in a "transmitter timer," a "receiver timer" that can be synchronized from a "timestamp" (whether "adjusted" or not), or a "transmission signal" subject to delays occurring at the time of transmission are also not disclosed in Fischer. *Id.* at Q&A 600. Complainants' expert Dr. Katti therefore testified that a person of ordinary skill in the art trying to develop a MAC layer timing synchronization method and apparatus such as that disclosed in the '867 patent would not be motivated to look to Fischer. *Id.* at Q&A 604.

Fischer does not disclose the claim element "the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer," or similar claim elements required by every asserted claim of the '867 patent. *Id.* at Q&A 606. Further, Fischer does not disclose a "timestamp" because that term is limited to CSMA systems as disclosed in the '867 patent. As discussed above, Fischer explicitly teaches away from a CSMA system that would use a timestamp. Inasmuch as Fischer fails to disclose a timestamp, Fischer likewise fails to disclose the claim element "the timestamp represents a value m within a count sequence of the transmitter timer" *Id.* at Q&A 607.

Fischer does not disclose the claim element "the timestamp accounts for delays due to a busy signal on a medium access protocol," as required explicitly or implicitly in every asserted claim of the '867 patent. *Id.* at Q&A 608. Nothing in Fischer demonstrates a "busy signal" on the medium. *Id.* at Q&A 609. Again, Fischer explicitly teaches away from the CSMA framework, which may involve busy signals, and instead teaches a TDMA/PRMA hybrid that relies on predesignated assigned times to manage communication among multiple units. *Id.* at Q&A 608-609. In light of the testimony from Respondents' expert Dr. Heegard that the term

"busy signal" is uniquely defined in the '867 patent as pertaining to CSMA systems only, a non-CSMA system such as James cannot disclose this limitation.

Fischer does not disclose the claim element "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer" in of the '867 patent. *Id.* at Q&A 611. Inasmuch as Fischer fails to disclose a timestamp, Fischer cannot disclose circuitry for adjusting a value based on a timestamp. *Id.*

For similar reasons, Fischer does not disclose the following claim elements: "the receiver counter commences a synchronizing count sequence beginning at the adjusted value," "circuitry for commencing the synchronizing count sequence after the transmission signal is completely received," and "circuitry for commencing the synchronizing count sequence after a CRC data in the received transmission signal is checked." *Id.* at Q&A 611-614.

Fischer does not disclose the claim element "the count sequence representing a value m at the time of transmission of the transmission signal." *Id.* at Q&A 615. Inasmuch as Fischer does not disclose a timestamp for the reasons discussed above, James cannot disclose this additional limitation. *Id.*

Finally, Fischer does not disclose a "traffic pending field" or a "timer interval field" because of the fundamental differences between Fischer and the '867 patent. *See id.* at Q&A 616.

Therefore, it is determined that Respondents have not shown by clear and convincing evidence that Fischer anticipates any asserted claim of the '867 patent.

e. U.S. Patent No. 4,337,463 ("Vangen")

Respondents argue that U.S. Patent No. 4,337,463 ("Vangen") anticipates asserted claims 26-32, 47, 49, 52-56, and 58-59 of the '867 patent. Resps. Br. at 212-14. Respondents do not

substantively discuss Vangen in their post-hearing brief, however, and for this reason alone it is determined that Respondents have not proved anticipation. *See id.* Nevertheless, the record evidence also shows that Vangen does not disclose all limitations of the '867 claims identified above.

Vangen is directed to a "time synchronization transmitter-receiver system to be used between a master station and a remote station" for applications such as the "electric utility industry" that desires to "accurately record the time of day of electric meter readings" even if events occur such as "power outages or brief power interruptions which may delay time clock data or perhaps destroy time clock data altogether." RX-0311 (Vangen '463) at col. 1, lns. 6-23. Vangen accomplishes this by having a "master station transmitter" send "a timing information signal addressed to a particular remote station." RX-0311 (Vangen '463) at col. 2, lns. 3-6.

Vangen does not disclose the claim element "a radio modem capable of periodically receiving a transmission signal from a transmitter" as required by every asserted claim of the '867 patent. CX-1641C (Katti RWS) at Q&A 624. Vangen does not use the word "modem" and therefore no "radio modem" is disclosed, regardless of Vangen's references to radio communication. *Id.*

Vangen does not disclose the claim element "wherein the compensation factor compensates for propagation delay at the receiver." *Id.* at Q&A 625-626. Vangen does not mention "propagation delay" or disclose any delay related to any "propagation delay at the receiver." *Id.*

Vangen does not disclose the claim element "a wireless local area network receiver." *Id.* at Q&A 627-628. To the extent the claim term "a wireless local area network receiver" is limiting, Vangen does not disclose this claim element. *Id.* Vangen does not disclose a receiver

in anything resembling a "wireless local area network" as that term would be understood by a person of ordinary skill in the art. *Id.*

Vangen does not disclose the claim element "wherein the receiver retrieves the timestamp." *Id.* at Q&A 629-630. There is no specific disclosure in Vangen as to how the alleged timestamp is retrieved. *Id.*

Therefore, it is determined that Respondents have not shown by clear and convincing evidence that Vangen anticipates any asserted claim of the '867 patent.

f. U.S. Patent No. 5,295,154 ("Meier")

Respondents argue that U.S. Patent No. 5,295,154 ("Meier") anticipates asserted claims 20, 23-24, 26, 29-30, 32-35, 37-40, 47, 49-55, and 60-61 of the '867 patent. Resps. Br. at 217-19. Respondents do not substantively discuss Meier in their post-hearing brief, however, and for this reason alone it is determined that Respondents have not proved anticipation. *See id.* Nevertheless, the record evidence also shows that Meier does not disclose all limitations of the '867 claims identified above.

Meier is directed to routing data through a network of intermediate base stations in a radio data communication system. CX-1641C (Katti RWS) at Q&A 637. Meier describes his invention as one that can "route data efficiently dynamically, and without looping," can "make the routing of the data transparent to the RF terminals" and will be "capable of handling RF terminal mobility and lost nodes with minimal impact on the entire RF data communication system." RX-0394 (Meier '154) at col. 2, lns. 26-36.

Meier discloses a "multiple-hop communications system" composed of "one or more host computers and multiple gateways, bridges, and RF terminals." *Id.* at col. 1, lns. 53-55. Meier discloses a host computer communicates over a wired network with wireless base stations and a

"gateway 20 which acts as the root node for the spanning tree of the RF data network of the present invention." *Id.* at col. 2, lns 50-53. The "gateway" communicates through either "hard-wired" links or "RF" links to "bridges" and these "bridges" can further communicate with other "bridges" and simultaneously "RF terminals" which are "non-bridging stations." *Id.* at Fig. 1, col. 2, lns. 45-65. In Meier, "[a]ll messages are routed along branches of the spanning tree," which is "rooted at the gateway 20," and the "[s]panning tree organization is facilitated with a HELLO protocol which allows nodes to determine the shortest path to the root before attaching to the spanning tree." *Id.* at col. 3, lns. 19-20; col. 9, lns. 64-68.

Meier discloses that the "HELLO protocol" resides within the "network layer" of the system, which is distinct from the "Data Link Control (DLC) layer" and its sub-layer for "Medium Access Control (MAC)". *Id.* at col. 7, ln. 61 – col. 8, lns. 53. As discussed above, the '867 patent discloses a MAC protocol, which is distinct from the network layer. CX-1641C (Katti RWS) at Q&A 642. Accordingly, Meier is of little relevance to the MAC protocol issues addressed by the '867 patent. *Id.*

In addition to operating at a completely different layer from the system of the '867 patent, Meier discloses a deterministic communication protocol that contrasts with the claimed invention in the '867 patent. One aspect of the "HELLO protocol" in Meier is the broadcast of "hello messages," also called "HELLO packets" elsewhere in Meier, in discrete "hello slots" at "calculated intervals" during which "Nodes refrain from transmitting during busy hello slots." RX-0394 (Meier '154) at col. 7, ln. 68 – col. 8, ln. 2. Meier further discloses that these "HELLO packets" include such information as "a 'seed' value used to calculate the time of the next hello message," "a hello slot displacement," and a "pending message list." *Id.* at col. 10, lns. 5-36.

The RF terminals in the Meier system know when to expect these "HELLO packets" because all nodes "can execute the algorithm i times to determine the time (and seed) if [sic] the i-th hello message from the transmitter." *Id.* at col. 13, lns. 33-35. Furthermore, Meier discloses that "Repeater nodes learn which hello slots are busy and refrain from transmitting during busy hello slots." If a busy hello slot is encountered, "the next free slot is used and a hello 'displacement' field indicates the offset from the calculated slot. Cumulative delays are not allowed (i.e., contention delays during the i hello transmission do not effect [sic] the time of the i+1 hello transmission)." *Id.* at col. 13, lns. 22-24.

Thus, transmission of the HELLO packets is predetermined. CX-1641C (Katti RWS) at Q&A 647. "HELLO packets" are transmitted at random intervals, but their "hello times" of transmission are entirely deterministic within the network layer count of "slots" for all nodes in the network many intervals in advance of their actual transmission. *Id.* at Q&A 648. HELLO packets are only transmitted in "hello slots," which are separated by regular intervals. *Id.* If there is an attempt to transmit a HELLO packet during a busy slot, it will be transmitted on the next slot instead. *Id.* Thus, a HELLO packet is always transmitted one of a number of predetermined slots, similar to a TDMA system. *Id.*

This deterministic communication is consistent with the fact that precise timing synchronization at the MAC layer is not essential to the operation of the network layer. *Id.* at Q&A 649. One important function of the "HELLO packets" in Meier, beyond the core function of organizing an optimal spanning tree, is the "pending message" feature by which the "network layer" notifies "SLEEPING nodes" that it will try to send such terminals any stored messages. *Id.* at Q&A 650; RX-0394 (Meier '154) at col. 13, lns. 51-64. This function, however, operates at the network layer, whereas the '867 patent is directed toward the MAC layer, and the precise

MAC-layer timing of the '867 patent is neither necessary for the operation of the Meier system nor enabled by Meier itself. CX-1641C (Katti RWS) at Q&A 651-652; RX-0394 (Meier '154) at col. 8, lns. 20-23; col. 13, lns. 51-64; col. 15, lns. 46-60.

Meier is therefore not consistent with the teachings of the '867 patent. *Id.* at Q&A 654. Meier fails to disclose virtually any of the asserted claim elements, including a timestamp field (and hence a timestamp that represents a count sequence value at the time of transmission), adjusting a timestamp (and hence commencing a count at an adjusted timestamp), using a compensation factor for an adjustment, a radio modem, a timer interval field, and accounting for delays due to a busy signal on a medium access protocol. *Id.* at Q&A 655.

Thus, Complainants' expert Dr. Katti testified that, because of all of these factors teach away from dependence on MAC layer timing synchronization, a person of ordinary skill in the art attempting to develop a MAC layer timing synchronization method and apparatus such as that disclosed in the '867 patent would specifically be motivated not to consider a network layer spanning tree optimization reference such as Meier in order to obtain the inventions embodied in the '867 patent. *Id.* at Q&A 659.

The "hello displacement field" does not correspond to the "timestamp" in the asserted '867 claims because it is not disclosed as a "count sequence" in a "transmitter timer." *Id.* at Q&A 656. There is also no disclosure of any "receiver timer" that in any way synchronizes to the "hello 'displacement' field." *Id.* Accordingly, Meier does not disclose the claim element "the transmission signal including a timestamp field, the timestamp field including a timestamp having a value m for synchronizing the receiver counter with a transmitter timer, wherein the timestamp represents a value m within a count sequence of the transmitter timer" or similar elements as required by every asserted claim of the '867 patent. *Id.* at Q&A 661.

The hello slot displacement value also does not account for delays due to a busy signal on a medium access protocol. *Id.* at Q&A 662-664. Inasmuch as Meier fails to disclose a "timestamp," Meier necessarily fails to disclose the claim element "wherein the timestamp accounts for delays due to a busy signal on a medium access protocol." *Id.* Further, Meier fails to address the specific problem of a "busy signal on a medium access protocol" addressed by the '867 patent. *Id.* Whereas the delays in the '867 patent are unpredictable due to traffic on the medium, the HELLO messages in Meier are sent in discrete, predetermined "hello slots." *Id.* If a busy slot is chosen, the next free slot is used. *Id.* This is different from a "busy signal." *Id.* A "busy signal" indicates that the medium is busy for some undetermined amount of time. *Id.* The slots disclosed in Meier are discrete, and therefore the timing of a transmission signal is always deterministic, *i.e.*, if a busy slot is encountered the signal simply moves on to the next slot. *Id.*

Respondents have not identified anything in Meier that discloses the claim element "wherein the header field includes type data indicating a type of the transmission signal." *Id.* at Q&A 665-666.

Meier does not disclose the claim element "circuitry for adjusting a value, based on the timestamp, at which a count sequence begins at the receiver timer." *Id.* at Q&A 667-668. Inasmuch as Meier fails to disclose a timestamp, it necessarily fails to disclose any other claim element relying on a timestamp. *Id.* Also, Meier cannot disclose any other claim element that includes an "adjusted value," because there is no adjusted value based on a timestamp. *Id.*

For similar reasons, Meier fails to disclose the following claim elements: "the receiver counter commences a synchronizing count sequence beginning at the adjusted value," "an adder for adding a compensation factor to the value at which the count sequence begins," and "wherein

the compensation factor compensates for propagation delay at the receiver." *Id.* at Q&A 669-671.

Respondents have not identified anything in Meier that meets the limitation "wherein the transmission signal further includes a timer interval field, and the timer interval field includes timer interval data indicating an interval between periodic transmissions of transmission signals including traffic pending field." *Id.* at Q&A 672-673.

Meier does not disclose the claim element "wherein the receiver retrieves the timestamp" in the '867 patent because nothing in Meier specifically discloses the manner in which the timestamp is retrieved and used by the receiver. *Id.* at Q&A 674-675.

Therefore Respondents have not shown by clear and convincing evidence that Meier anticipates any asserted claim of the '867 patent.

3. Obviousness

a. Motorola WIN/White in Combination with Other Prior Art References

Respondents allege that the Motorola WIN/White system in combination with other prior art references renders obvious the asserted claims of the '867 patent.[60] *See* Resps. Br. at 221-23; GR12 Filing at 24-43. Respondents, however, failed to brief these combinations in a substantive manner. *See* Resps. Br. at 221-23. Therefore, it is determined that Respondents have not shown by clear and convincing evidence that Motorola WIN/White in combination with other art renders obvious the asserted claims of the '867 patent.

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[60] Respondents also argue that Motorola WIN/White alone renders obvious the '867 asserted claims. *See* GR12 Filing at 43. Respondents did not brief this argument, however. *See* Resps. Br. at 219-23. Accordingly, it is determined that Respondents have not established that Motorola WIN/White renders any asserted '867 claim obvious.

b. James in Combination with Other Prior Art References

Respondents allege that James in combination with other prior art references renders obvious the asserted claims of the '867 patent.[61] *See* Resps. Br. at 223; GR12 Filing at 24-43. Respondents, however, failed to brief these combinations in a substantive manner. *See* Resps. Br. at 223. Therefore, it is determined that Respondents have not shown by clear and convincing evidence that James in combination with other art renders obvious the asserted claims of the '867 patent.

c. Secondary Considerations

Complainants argue that secondary considerations demonstrate that the asserted claims of the '867 patent are not obvious. *See* Compls. Br. at 538-41. Specifically, it is argued that evidence of commercial success, long felt but unmet need, failure of others, copying, and praise for the invention weighs against a finding of obviousness. The evidence adduced by Complainants, however, fails to establish the requisite nexus between the secondary considerations and the '867 patent. Moreover, inasmuch as Respondents have not shown by clear and convincing evidence that the asserted claims are anticipated or rendered obvious in light of the cited prior art references, the secondary considerations play only a minor role in the validity analysis of the '867 patent.[62]

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[61] Respondents also argue that James alone renders obvious the '867 asserted claims. *See* GR12 Filing at 43. Respondents did not brief this argument, however. *See* Resps. Br. at 219-23. Accordingly, it is determined that Respondents have not established that James renders any asserted '867 claim obvious.

[62] In any event, the discussion of the validity of the '867 patent is provided in the alternative, inasmuch as it has been determined that the asserted claims of the '867 patent are not infringed.

4. Indefiniteness

Respondents argue that the asserted claims of the '867 patent are invalid under 35 U.S.C. § 112 for indefiniteness.[63] *See* Resps. Br. at 226 (citing RX-0006C (Heegard WS) at Q&A 1787-1823). Based on the record evidence, it is determined that Respondents have not shown that the asserted claims are indefinite.

With respect to the limitation "the traffic pending field" in claim 23, Respondents argue this limitation is indefinite because "[t]he term 'the' before a claim term refers to the antecedent of the claim term, but there is no prior antecedent for 'the traffic pending field.'" Resps. Br. at 227. A person of ordinary skill in the art, however, would recognize that claim 23 contains a typographical error and construe "the traffic pending field" as "a traffic pending field." CX-1641C (Katti RWS) at Q&A 793. The term "traffic pending field" without the article is well defined. *See, e.g.*, JX-0005 ('867 patent) at col. 5, lns 7-8.

Respondents also argue that "claims 20, 34, and 47 are indefinite for failing to define any structural relationship between the 'receiver counter' and the 'radio modem.' The claims require no relationship between those elements, and thus, it is unclear to a person of art how the relationship affects the scope of the claims." Resps. Br. at 227-28. Complainants' expert Dr. Katti testified that a person of ordinary skill in the art would understand how to construct a device with a radio modem and receiver counter as recited in these claims. CX-1641C (Katti

[63] Respondents also argue that the asserted claims of the '867 patent are invalid under 35 U.S.C. § 112 for lack of written description and lack of enablement. *See* Resps. Br. at 226. The issues of lack of written description and lack of enablement with respect to the '867 patent, however, were not identified in the GR12 Filing as issues to be addressed in this Initial Determination. *See* GR12 Filing at 15-44. Accordingly, the administrative law judge declines to make any findings with respect to these issues.

RWS) at Q&A 794-795. These claims do not require any "relationship" between the radio modem and the receiver counter, only that these components be present in the device. *Id.*

Therefore, Respondents have not shown that any asserted '867 claim is invalid for indefiniteness.[64]

IX. Domestic Industry

A. General Principles of Law

A violation of section 337(a)(1)(B), (C), (D), or (E) can be found "only if an industry in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). Section 337(a) further provides:

> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned—
>
> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3).

These statutory requirements consist of an economic prong (which requires certain activities)[65] and a technical prong (which requires that these activities relate to the intellectual

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[64] The GR12 Filing indicates that this Initial Determination should address whether all asserted '867 claims are invalid for indefiniteness. *See* GR12 Filing at 43-44. Respondents, however, only briefed claims 20, 23, 34, and 47. *See* Resps. Br. at 226-28. Accordingly, the administrative law judge declines to make any findings with respect to the other asserted claims.

[65] The Commission practice is usually to assess the facts relating to the economic prong at the time that the complaint was filed. *See Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, Inv. No. 337-TA-560, Comm'n Op. at 39 n.17 (Apr. 14,

property being protected). *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm'n Op. at 13 (May 16, 2008) ("*Stringed Musical Instruments*"). The burden is on the complainant to show by a preponderance of the evidence that the domestic industry requirement is satisfied. *Certain Multimedia Display and Navigation Devices and Systems, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-694, Comm'n Op. at 5 (July 22, 2011) ("*Navigation Devices*").

"With respect to section 337(a)(3)(A) and (B), the technical prong is the requirement that the investments in plant or equipment and employment in labor or capital are actually related to 'articles protected by' the intellectual property right which forms the basis of the complaint." *Stringed Musical Instruments* at 13-14. "The test for satisfying the 'technical prong' of the industry requirement is essentially same as that for infringement, i.e., a comparison of domestic products to the asserted claims." *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). "With respect to section 337(a)(3)(C), the technical prong is the requirement that the activities of engineering, research and development, and licensing are actually related to the asserted intellectual property right." *Stringed Musical Instruments* at 13.

With respect to the economic prong, and whether or not section 337(a)(3)(A) or (B) is satisfied, the Commission has held that "whether a complainant has established that its investment and/or employment activities are significant with respect to the articles protected by

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2010) ("We note that only activities that occurred before the filing of a complaint with the Commission are relevant to whether a domestic industry exists or is in the process of being established under sections 337(a)(2)-(3).") (citing *Bally/Midway Mfg. Co. v. U.S. Int'l Trade Comm'n*, 714 F.2d 1117, 1121 (Fed. Cir. 1983)). In some cases, however, the Commission will consider later developments in the alleged industry, such as "when a significant and unusual development occurred after the complaint has been filed." *See Certain Video Game Systems and Controllers*, Inv. No. 337-TA-743, Comm'n Op., at 5-6 (Jan. 20, 2012) ("[I]n appropriate situations based on the specific facts and circumstances of an investigation, the Commission may consider activities and investments beyond the filing of the complaint.").

the intellectual property right concerned is not evaluated according to any rigid mathematical formula." *Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. at 27 (Feb. 17, 2011) ("*Printing and Imaging Devices*") (citing *Certain Male Prophylactic Devices*, Inv. No. 337 TA-546, Comm'n Op. at 39 (Aug. 1, 2007)). Rather, the Commission examines "the facts in each investigation, the article of commerce, and the realities of the marketplace." *Id.* "The determination takes into account the nature of the investment and/or employment activities, 'the industry in question, and the complainant's relative size.'" *Id.* (citing *Stringed Musical Instruments* at 26).

With respect to section 337(a)(3)(C), whether an investment in domestic industry is "substantial" is a fact-dependent inquiry for which the complainant bears the burden of proof. *Stringed Musical Instruments* at 14. There is no minimum monetary expenditure that a complainant must demonstrate to qualify as a domestic industry under the "substantial investment" requirement of this section. *Id.* at 25. There is no need to define or quantify an industry in absolute mathematical terms. *Id.* at 26. Rather, "the requirement for showing the existence of a domestic industry will depend on the industry in question, and the complainant's relative size." *Id.* at 25-26.

When a complainant relies on licensing[66] to demonstrate the existence of a domestic industry pursuant to section 337(a)(3)(C), the Commission has explained the showing required of the complainant as follows:

> Complainants who seek to satisfy the domestic industry requirement by their investments in patent licensing must establish that their asserted investment activities satisfy three requirements of section 337(a)(3)(C).

[66] A recent Federal Circuit opinion confirms that a finding of domestic industry under section 337(a)(3)(C) can be supported by licensing activities alone. *InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 690 F.3d 1318, 1329-30 (Fed. Cir. 2012).

> First, the statute requires that the investment in licensing relate to "its exploitation," meaning an investment in the exploitation of the asserted patent. 19 U.S.C. § 1337(a)(3)(C) . . . . Second, the statute requires that the investment relate to "licensing." 19 U.S.C. § 1337(a)(3)(C) . . . . Third, any alleged investment must be domestic, i.e., it must occur in the United States. 19 U.S.C. § 1337(a)(2), (a)(3). Investments meeting these requirements merit consideration in our evaluation of whether a complainant has satisfied the domestic industry requirement. Only after determining the extent to which the complainant's investments fall within these statutory parameters can we evaluate whether complainant's qualifying investments are "substantial," as required by the statute. 19 U.S.C. § 1337(a)(3)(C). If a complainant's activity is only partially related to licensing the asserted patent in the United States, the Commission examines the strength of the nexus between the activity and licensing the asserted patent in the United States.

Navigation Devices at 7-8 (footnotes omitted).

In *Navigation Devices*, the Commission held that, "[w]here the complainant's licensing activities and investments involve a group of patents or a patent portfolio, the complainant must present evidence that demonstrates the extent of the nexus between the asserted patent and the complainant's licensing activities and investments." *Navigation Devices* at 9. The Commission provided a non-exhaustive list of factors it may consider to establish the strength of the nexus, including (1) the number of patents in the portfolio, (2) the relative value contributed by the asserted patent to the portfolio, (3) the prominence of the asserted patent in licensing discussions, negotiations and any resulting license agreement, and (4) the scope of technology covered by the portfolio compared to the scope of the asserted patent. *Id.* at 10. "A showing that the asserted patent is relatively important within the portfolio is not required to show a nexus between that patent and the licensing activities . . . but may be one indication of the strength of the nexus." *Id.* at 11.

For the purposes of satisfying the domestic industry requirement a patentee can rely on the activities of a licensee. *See, e.g.*, *Certain Electronic Devices, Including Handheld Wireless*

Communications Devices, Inv. Nos. 337-TA-673, 337-TA-667, Order No. 49C at 4-5 (Oct. 15, 2009).

B. Complainants' Investments in Licensing the Asserted Patents

Complainants argue that they have made substantial investments in the exploitation of each of the patents-in-suit through Complainants' U.S.-based licensing activities that are dedicated to, among others, the patents-in-suit. Compls. Br. at 547-70; Compls. Reply at 170-89. Respondents oppose a finding of domestic industry. Resps. Br. at 516-43; Resps. Reply at 153-57.

The record evidence shows that each asserted patent was developed in-house at Complainants' facilities, or their predecessor's. CX-1598C (Salute WS) at Q&A 22, Q&A 28, Q&A 39; CX-1595C (Kerr WS) at Q&A 218, Q&A 223, Q&A 231. In the past, LSI manufactured platforms that practiced the '663 Patent, and LSI unveiled the first video technology platform compliant with the ITU-T H.264/MPEG-4 Advanced Video Coding (AVC) standard. CX-1598C (Salute WS) at Q&A 28-38.

The record evidence also shows that [ ] major companies have taken a license to the asserted patents[67] and, since 2008, the licenses covering one or more of the asserted patents have

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[67] Complainants have licensed the asserted patents as part of long-term licensing agreements with major technology companies, including, among others, [ ] CX-0949C (LSI-Agere 4th Response to 2nd Rog. Set, Aug. 31, 2012), CX-0027C ([ ] PLA); CX-0693C ([ ] PLA); CX-0034C ([ ] PLA Amendment); CX-0398C ([ ] PLA); CX-0036C ([ ] PLA); CX-0038C ([ ] PLA); CX-0039C ([ ] PLA); CX-0026C ([ ] PLA); CX-0704C ([ ] PLA); CX-0042C ([ ] PLA); CX-0667C ([ ] PLA); CX-0668C ([ ] PLA); CX-0028C ([ ] PLA); CX-0672C ([ ] PLA); CX-0694C ([ ] PLA); CX-0673C ([ ] PLA); CX-0674C ([ ] PLA); CX-0035C ([ ] PLA); CX-0695C ([ ] PLA); CX-0677C ([ ] PLA); CX-0682C ([ ] PLA); CX-0684C ([ ] PLA); CX-0703C ([ ] PLA); CX-0669C ([ ] PLA);

generated [ ] in revenue and are expected to generate an additional [ ] CX-1598C (Salute WS) at Q&A 197-198; CX-0400C; CX-0761C. To further capitalize on the asserted "exemplary" patents and others in their vast portfolio, Complainants have established and continue to maintain a licensing practice in the United States, which employs [ ] individuals in several facilities across the United States. CX-1598C (Salute WS) at Q&A 57-59, Q&A 199-209; CX-1599C (Waskiewicz WS) Q&A 23-54.

Complainants have adduced evidence showing that they own a 600,000-square-foot office complex in Allentown, Pennsylvania for administration, licensing, and engineering. CX-0921 (2011-02-28 LSI 10-K) at 17. This facility houses Complainants' licensing business unit, including a reverse engineering laboratory. CX-1598C (Salute WS) at Q&A 59; CX-0712C. Complainants additionally lease office space in two buildings in Milpitas, California for corporate headquarters, administration (including licensing), and engineering. CX-0921 (2011-02-28 LSI 10-K) at 17; CX-1598C (Salute WS) at Q&A 59; CX-0712C. Complainants also own approximately 330,000 square feet of space across two facilities in Fort Collins and Colorado Springs, Colorado for sales and engineering operations, and approximately 330,000 square feet of space in Wichita, Kansas for engineering, administration (including licensing), and training. *Id.* As of the end of fiscal year 2010, Complainants held approximately $205 million in long-lived assets in North America, primarily in the United States, out of a total of approximately $223 million worldwide. CX-0921 (2011-02-28 LSI 10-K) at 77.

CX-0670C ([ ] PLA); CX-0698C ([ ] PLA); CX-0705C ([ ] Agreement); CX-0676C ([ ] PLA); CX-0696C ([ ] PLA); CX-0681C ([ ] PLA Amendment); CX-0678C ([ ] PLA); and CX-0025C ([ ] PLA).

The evidence shows that Complainants' business operation is divided into separate units with specific goals and objectives. Included in these units is [

]" CX-1568C; CX-1595C (Kerr WS) at Q&A 205-208; CX-1599C (Waskiewicz WS) at Q&A 23-37. [

] CX-1598C (Salute WS) at Q&A 104; CX-1599C (Waskiewicz WS) at Q&A 52-54; CX-1595C (Kerr WS) at Q&A 212. [

] CX-1599C (Waskiewicz WS) at Q&A 52-54.

Complainants have shown that the [ ] has a dedicated facility located in Allentown, Pennsylvania, and occupies approximately [ ] square feet for offices and laboratory space to accommodate [ ] professionals dedicated to licensing. CX-1598C (Salute WS) at Q&A 58-60; CX-1595C (Kerr WS) at Q&A 80; CX-0712C. [ ] has invested over [ ] on its continuing licensing operations in the United States since 2008, including over [ ] in salary and benefits for its dedicated employees. CX-1595C (Kerr WS) at Q&A 214. Over this same period, [ ] has generated approximately [ ] in licensing revenue, and Complainants claim that more than [ ] of this total was derived from licenses covering one or more of the asserted patents. *Id.*

Within the engineering facility in Allentown, [ ] has invested nearly [ ] in equipment dedicated to engineering activities devoted to licensing Complainants' patent

portfolio. CX-1598C (Salute WS) at Q&A 209. Likewise, Complainants have invested [ ] purchasing consumer products to determine whether such products utilize the technology covering the asserted patents or others in Complainants' vast portfolio. CX-1598C (Salute WS) at Q&A 207; CX-0769C. All of [ ] investments are dedicated to licensing Complainants' patent portfolio, which includes the asserted patents. CX-1599C (Waskiewicz WS) at Q&A 52-54.

The testimonial evidence shows that [ ] is responsible for all communications and negotiations related to licensing. CX-1598C (Salute WS) at Q&A 104; CX-1599C (Waskiewicz WS) at Q&A 52-54; CX-1595C (Kerr WS) at Q&A 212. [ ] conduct internal investigations of potential licensees' products and, if warranted, it can and does send out notices to potential licensees informing them of the possibility of obtaining a license. CX-1598C (Salute WS) at Q&A 213-539; CX-1599C (Waskiewicz WS) at Q&A 55-111; CX-1595C (Kerr WS) at Q&A 309; *see* CDX-1000C (listing assertion documents that specifically identify the asserted patents).

With respect to the requirement that the licensing expenditures have a nexus to the asserted patents, Complainants have identified [ ] licensing negotiations (events) that identify the asserted patents. CX-1598C (Salute WS) at Q&A 213-539; CX-1599C (Waskiewicz WS) at Q&A 55-111; CX-1595C (Kerr WS) at Q&A 309; *see* CDX-1000C (listing assertion documents that specifically identify the asserted patents). Upon reviewing each of the [ ] assertion documents, Dr. Kerr identified which asserted patent was specifically identified in the following demonstrative:

ASSERTION DOCUMENT INDEX

CDX-1000C

CX No.	Doc Date	Company	6,452,858 (van Ner 958)	6,707,867 (Dupontreire 867)	6,932,463 (Wagner 463)	5,370,047 (Chen 047)	BegBates	EndBates	Presentation/ Assertion Letter
CX-0987C	4/12/2008	Acer	X	X	X		LSIAgere337-00134948	LSIAgere337-00134959	Notice Letter
CX-0782C	7/25/2008	Acer	X	X	X		LSIAgere337-00977232	LSIAgere337-00977313	Assertion Presentation
CX-1199C	12/28/2008	Acer	X	X	X		LSIAgere337-00756848	LSIAgere337-00755515	Assertion Presentation
CX-1149C	2/17/2009	Acer	X	X	X		LSIAgere337-00407279	LSIAgere337-00407315	Follow-Up Presentation
CX-0350C	7/29/2009	Acer	X	X	X		LSIAgere337-00214240	LSIAgere337-00214284	Follow-Up Presentation
CX-0783C	10/28/2009	Acer	X	X	X		LSIAgere337-00752848	LSIAgere337-00752858	Assertion Presentation
CX-0151C	3/23/2011	Alpine				X	LSIAgere337-00485791	LSIAgere337-00485879	Assertion Presentation
CX-1156C	9/10/2010	Amazon	X	X			LSIAgere337-00474774	LSIAgere337-00474775	Notice Letter
CX-1187C	10/27/2006	Apple	X	X			LSIAgere337-00513065	LSIAgere337-00513068	Notice Letter
CX-1162C	3/7/2007	Apple		X			LSIAgere337-00474800	LSIAgere337-00474801	Notice Letter
CX-1153C	1/18/2008	Apple	X		X		LSIAgere337-00474794	LSIAgere337-00474795	Notice Letter
CX-1155C	5/4/2008	Apple	X	X	X		LSIAgere337-00457584	LSIAgere337-00457586	Notice Letter
CX-1167C	3/8/2010	Archos	X		X		LSIAgere337-00475563	LSIAgere337-00475564	Notice Letter
CX-1157C	7/6/2010	Archos	X	X	X		LSIAgere337-00474185	LSIAgere337-00474188	Assertion Presentation
CX-0770C	8/3/2010	ASUSTek	X	X	X		LSIAgere337-00977929	LSIAgere337-00977930	Notice Letter
CX-1190C	11/29/2010	ASUSTek	X	X			LSIAgere337-00750919	LSIAgere337-00751044	Assertion Presentation
CX-1133C	6/29/2010	Barnes & Noble	X	X			LSIAgere337-00425948	LSIAgere337-00425950	Notice Letter
CX-1154C	8/17/2010	Barnes & Noble	X	X			LSIAgere337-00425951	LSIAgere337-00425954	Repeated Assertion Letter
CX-1188C	5/29/2009	Best Buy (Sanyo)			X		LSIAgere337-00513801	LSIAgere337-00513805	Notice Letter
CX-1136C	12/24/2007	Canon			X		LSIAgere337-00134764	LSIAgere337-00134766	Notice Letter
CX-1135C	1/22/2008	Canon	X		X	X	LSIAgere337-00134890	LSIAgere337-00134884	Assertion Presentation
CX-1219C	10/4/2010	Comcast		X			LSIAgere337-01180948	LSIAgere337-01180948	Notice Letter
CX-1169C	3/14/2008	Creative			X		LSIAgere337-00475569	LSIAgere337-00475570	Notice Letter
CX-1168C	12/11/2008	Creative	X				LSIAgere337-00475567	LSIAgere337-00475568	Notice Letter
CX-1158C	9/22/2010	Creative	X				LSIAgere337-00474481	LSIAgere337-00474482	Assertion Presentation
CX-0772C	12/23/2008	Dell			X		LSIAgere337-00426141	LSIAgere337-00426143	Notice Letter
CX-1145C	3/12/2008	Funai			X		LSIAgere337-00405881	LSIAgere337-00405066	Assertion Presentation
CX-1146C	6/18/2008	Funai			X		LSIAgere337-00405612	LSIAgere337-00405662	Follow-Up Presentation
CX-1147C	11/18/2008	Funai			X		LSIAgere337-00405807	LSIAgere337-00405844	Follow-Up Presentation
CX-1390C	1/29/2009	Funai			X	X	LSIAgere337-00513875	LSIAgere337-00513882	Assertion Presentation
CX-0331C	4/23/2009	Funai			X		LSIAgere337-00513878	LSIAgere337-00513905	Assertion Presentation
CX-1148C	6/24/2009	Funai			X		LSIAgere337-00405896	LSIAgere337-00405922	Follow-Up Presentation
CX-0333C	6/24/2009	Funai			X		LSIAgere337-00405923	LSIAgere337-00405973	Follow-Up Presentation
CX-1151C	11/11/2008	Funai			X		LSIAgere337-00421029	LSIAgere337-00421087	Follow-Up Presentation
CX-1174C	2/17/2008	iRiver	X		X	X	LSIAgere337-00476168	LSIAgere337-00476195	Assertion Presentation
CX-1173C	7/18/2008	iRiver			X		LSIAgere337-00475955	LSIAgere337-00475973	Follow-Up Presentation
CX-1172C	1/7/2009	iRiver			X		LSIAgere337-00475932	LSIAgere337-00475954	Follow-Up Presentation
CX-1154C	6/16/2009	iRiver			X		LSIAgere337-00475220	LSIAgere337-00475244	Follow-Up Presentation
CX-1183C	10/15/2009	iRiver	X		X		LSIAgere337-00475201	LSIAgere337-00475219	Follow-Up Presentation
CX-1187C	10/23/2009	iRiver	X		X		LSIAgere337-00749228	LSIAgere337-00749322	Follow-Up Presentation
CX-1198C	6/17/2010	iRiver			X		LSIAgere337-00749364	LSIAgere337-00749401	Follow-Up Presentation
CX-1196C	12/13/2011	JVC Kenwood				X	LSIAgere337-00746802	LSIAgere337-00746898	Assertion Presentation
CX-1194C	8/24/2011	JVC Kenwood				X	LSIAgere337-00493372	LSIAgere337-00493398	Assertion Presentation
CX-1156C	12/23/2009	Lenovo	X	X			LSIAgere337-00457567	LSIAgere337-00457569	Notice Letter
CX-1143C	1/25/2006	LGE	X	X			LSIAgere337-00181423	LSIAgere337-00181425	Notice Letter
CX-1138C	2/27/2006	LGE	X	X			LSIAgere337-00140107	LSIAgere337-00140250	Assertion Presentation
CX-1139C	5/8/2006	LGE	X	X			LSIAgere337-00140698	LSIAgere337-00140792	Assertion Presentation
CX-1134C	4/15/2006	LGE	X	X			LSIAgere337-00134421	LSIAgere337-00134452	Assertion Presentation
CX-1177C	12/28/2007	LGE			X		LSIAgere337-00485882	LSIAgere337-00485883	Notice Letter
CX-1179C	2/18/2008	LGE			X		LSIAgere337-00485884	LSIAgere337-00486001	Assertion Presentation
CX-1137C	10/2/2008	LGE	X	X	X	X	LSIAgere337-00139413	LSIAgere337-00139452	Assertion Presentation
CX-1144C	3/19/2009	LGE			X		LSIAgere337-00333625	LSIAgere337-00333180	Follow-Up Presentation
CX-1179C	11/9/2009	LGE			X		LSIAgere337-00486002	LSIAgere337-00486214	Follow-Up Presentation

CONTAINS CONFIDENTIAL BUSINESS INFORMATION – SUBJECT TO PROTECTIVE ORDER

CDX-1000C

ASSERTION DOCUMENT INDEX

CDX-1000C

CX No.	Doc Date	Company	6,452,958 (van Nee '958)	6,707,867 (Diepstraten '867)	4,982,663 (Winger '663)	5,574,687 (Chan '687)	BegBates	EndBates	Presentation/ Assertion Letter
CX-1181C	3/13/2008	Lite-On			X		LSIAgere837-00486218	LSIAgere837-00486391	Assertion Presentation
CX-1182C	10/20/2008	Lite-On			X		LSIAgere837-00486374	LSIAgere837-00486635	Assertion Presentation
CX-1180C	1/13/2009	Lite-On			X		LSIAgere837-00486115	LSIAgere837-00486165	Follow-Up Presentation
CX-1170C	1/24/2008	Microsoft	X		X		LSIAgere837-00475571	LSIAgere837-00475572	Notice Letter
CX-1296C	9/12/2008	Microsoft	X		X		LSIAgere837-01085588	LSIAgere837-01085789	Assertion Presentation
CX-1165C	1/6/2009	Microsoft	X				LSIAgere837-00475168	LSIAgere837-00475293	Follow-Up Presentation
CX-1166C	10/8/2009	Microsoft	X		X		LSIAgere837-00475294	LSIAgere837-00475312	Follow-Up Presentation
CX-1215C	6/28/2011	Mitsubishi				X	LSIAgere837-01093443	LSIAgere837-01093444	Notice Letter
CX-1140C	10/4/2007	Motorola	X	X			LSIAgere837-00177317	LSIAgere837-00177630	Assertion Presentation
CX-1193C	10/25/2007	Motorola		X			LSIAgere837-00524253	LSIAgere837-00524258	Notice Letter
CX-1203C	9/12/2008	Motorola		X			LSIAgere837-00786717	LSIAgere837-00786724	Notice Letter
CX-1142C	11/20/2008	Motorola	X	X			LSIAgere837-00181710	LSIAgere837-00181722	Follow-Up Presentation
CX-1195C	3/26/2009	Motorola	X	X			LSIAgere837-00517466	LSIAgere837-00517478	Assertion Presentation
CX-1196C	4/1/2010	MSI	X	X			LSIAgere837-00746636	LSIAgere837-00746637	Notice Letter
CX-1204C	1/21/2008	Nikon	X	X	X	X	LSIAgere837-00790509	LSIAgere837-00790414	Assertion Presentation
CX-1150C	5/13/2011	Nintendo		X			LSIAgere837-00407421	LSIAgere837-00407422	Notice Letter
CX-1202C	10/17/2011	Nintendo		X			LSIAgere837-00751296	LSIAgere837-00751364	Assertion Presentation
CX-1508C	1/9/2006	Nokia	X	X			LSIAgere837-01086843	LSIAgere837-01086853	Assertion Presentation
CX-0759C	8/15/2006	Nokia	X	X			LSIAgere837-00182496	LSIAgere837-00182507	Follow-Up Presentation
CX-0760C	4/3/2007	Nokia	X	X			LSIAgere837-00182399	LSIAgere837-00182415	Follow-Up Presentation
CX-0758C	1/30/2008	Nokia	X	X			LSIAgere837-00517980	LSIAgere837-00518002	Follow-Up Presentation
CX-0764C	3/26/2003	Panasonic	X				LSIAgere837-00337353	LSIAgere837-00337445	Follow-Up Presentation
CX-0765C	8/1/2007	Panasonic	X				LSIAgere837-00233695	LSIAgere837-00233446	Follow-Up Presentation
CX-0766C	1/16/2008	Panasonic	X				LSIAgere837-00234199	LSIAgere837-00234238	Follow-Up Presentation
CX-0767C	8/24/2009	Panasonic			X		LSIAgere837-00751565	LSIAgere837-00751627	Follow-Up Presentation
CX-0766C	1/25/2010	Panasonic			X		LSIAgere837-00480363	LSIAgere837-00480468	Follow-Up Presentation
CX-2537C	12/11/2008	Panasonic			X		LSIAgere837-01093825	LSIAgere837-01094004	Follow-Up Presentation
CX-1171C	6/21/2011	Pandigital	X	X			LSIAgere837-00475648	LSIAgere837-00475649	Notice Letter
CX-1183C	9/23/2008	Philips			X		LSIAgere837-00486640	LSIAgere837-00486691	Follow-Up Presentation
CX-1185C	9/16/2009	Philips				X	LSIAgere837-00493740	LSIAgere837-00493866	Assertion Presentation
CX-1206C	1/27/2009	Pioneer			X		LSIAgere837-01088046	LSIAgere837-01088079	Assertion Presentation
CX-1198C	2/6/2009	Pioneer	X	X	X		LSIAgere837-00527723	LSIAgere837-00527724	Notice Letter
CX-1186C	1/27/2010	Pioneer			X		LSIAgere837-00493867	LSIAgere837-00493905	Follow-Up Presentation
CX-1214C	3/31/2010	Pioneer	X	X	X		LSIAgere837-01093191	LSIAgere837-01093195	Follow-Up Presentation
CX-1208C	5/27/2010	Pioneer			X		LSIAgere837-01092985	LSIAgere837-01093014	Assertion Presentation
CX-1194C	11/16/2011	Samsung			X		LSIAgere837-00534168	LSIAgere837-00534398	Assertion Presentation
CX-1213C	6/9/2010	Samsung		X			LSIAgere837-01093173	LSIAgere837-01093196	Assertion Presentation
CX-1189C	1/8/2008	Sandisk	X		X		LSIAgere837-00513304	LSIAgere837-00513504	Notice Letter
CX-1148C	5/13/2009	Sharp			X		LSIAgere837-00272236	LSIAgere837-00272237	Notice Letter
CX-1207C	8/25/2009	Sharp			X		LSIAgere837-01089321	LSIAgere837-01089442	Assertion Presentation
CX-1210C	12/16/2009	Sharp			X		LSIAgere837-01090035	LSIAgere837-01090040	Follow-Up Presentation
CX-1211C	1/28/2010	Sharp			X		LSIAgere837-01093041	LSIAgere837-01093074	Follow-Up Presentation
CX-1209C	3/30/2010	Sharp			X		LSIAgere837-01092674	LSIAgere837-01092682	Follow-Up Presentation
CX-1152C	2/28/2011	Sharp				X	LSIAgere837-00422207	LSIAgere837-00422282	Assertion Presentation
CX-1216C	10/12/2011	Sharp				X	LSIAgere837-01130812	LSIAgere837-01130830	Follow-Up Presentation
CX-1212C	8/9/2010	Sony			X		LSIAgere837-01093117	LSIAgere837-01093118	Notice Letter
CX-1217C	10/22/2010	Sony				X	LSIAgere837-01130891	LSIAgere837-01130979	Assertion Presentation
CX-1218C	11/17/2011	Sony				X	LSIAgere837-01130980	LSIAgere837-01131018	Assertion Presentation
CX-1175C	5/29/2009	Target (Sandisk)	X		X		LSIAgere837-00477037	LSIAgere837-00477037	Notice Letter
CX-1159C	9/21/2011	Velocity Micro	X	X	X		LSIAgere837-00474653	LSIAgere837-00474766	Assertion Presentation
CX-1176C	5/29/2009	Wal-Mart (Sandisk)	X		X		LSIAgere837-00477084	LSIAgere837-00477085	Notice Letter
CX-1153C	6/3/2009	Yamaha	X	X			LSIAgere837-00134168	LSIAgere837-00134204	Assertion Presentation

CONTAINS CONFIDENTIAL BUSINESS INFORMATION – SUBJECT TO PROTECTIVE ORDER

CDX-1000C

The foregoing efforts to license the asserted patents resulted in licenses with numerous companies, including [ ] CX-0027C ([ ] PLA); CX-0036C ([ ] PLA); CX-0038C ([ ] PLA); CX-0039C ([ ] PLA); CX-0026C ([ ] PLA); CX-0682C ([ ] PLA); CX-0703C ([ ] PLA); CX-0696C ([ ] PLA); and CX-0025C ([ ] PLA). Complainants therefore argue that "there is a clear nexus between these licensing efforts, the asserted patents and the executed license agreement." Compls. Br. at 556. Complainants further argue that "a strong nexus between the relevant licenses and the asserted patents is further established by the fact that three of the four asserted patents (the van Nee '958, the Diepstraten

'867 and the Winger '663 patents) are standard essential patents." Compls. Br. at 556 (citing CX-1598C (Salute WS) at Q&A 28-38, Q&A 46-49; CX-0069).

While Complainants do not allocate expenses based on patents, Complainants' expert Dr. Kerr opined that a substantial portion of Complainants' licensing investments are allocable to licensing activities related to one or more of the asserted patents. Using licensing negotiation documents (events), Dr. Kerr made a conservative estimate of the amount of investment allocable to licensing the asserted patents. CX-1595C (Kerr WS) at Q&A 307-379.

Dr. Kerr estimates that since 2008 Complainants invested at least [ ] in employee costs in licensing activities related to one or more of the asserted patents. CX-1595C (Kerr WS) at Q&A 343-379. More specifically, Dr. Kerr allocated the amount invested to each separate asserted patent. These amounts are as follows: [ ] for the '958 patent, [ ] for the '867 patent, [ ] for the '087 patent, and [ ] for the '663 patent. CX-1595C (Kerr WS) at Q&A 343-379.

Complainants also adduced evidence showing significant litigation costs associated with licensing the asserted patents. In particular, the asserted patents have been the subject of litigation involving [ ] Sony Corporation ("Sony"), Vizio Incorporated ("Vizio"), and SanDisk Incorporated ("SanDisk"). CX-1598C (Salute WS) at Q&A 554-556. Although Complainants have litigated the asserted patent against other companies in order to license, Complainants are not relying on all expenditures relating to all litigations. *See* Compls. Br. at 326.

For example, Complainants [ ] filing litigation against Sony in August 2006. *See* CX-0778C; CX-408 (*Agere Systems Inc. v. Sony Corp.*, No. 2:06-CV-0079-TJW, First Am. Compl. (E.D. Tex. Aug. 8, 2006)). In that

litigation, ten Agere patents were initially asserted and one patent was dropped from the litigation, leaving nine patents in total asserted against Sony. Among the patents Agere asserted against Sony were the '867 and '958 patents. *Id.* Shortly after the court found that Sony infringed the asserted Diepstraten '867 patent, Sony [ ] asserted patents. *See* CX-1617; CX-0025C [( ] CX-0025C; CX-0026C. The record shows that Complainants incurred roughly [ ] in costs related to the Sony litigation, including attorney fees and related expenses. CX-1595C (Kerr WS) at Q&A 383-390. Giving equal weight to the patents asserted against Sony suggests that Complainants invested approximately [ ] each on litigation related to the '867 and '958 patents. CX-1595C (Kerr WS) at Q&A 390.

Similarly, [ ] initiating litigation against Vizio in 2010. CX-0801C ([ ]); CX-0802C ([ ]); CX-0803C ([ ]); CX-0804C ([ ]) [ ] Complainants were filed suit against Vizio, in the United States District Court of the Central District of California, Western Division. CX-1595C (Kerr WS) at Q&A 391-402; *see LSI Corporation v. Vizio Inc.*, No. 8:10-cv-01602AG-AJW (C.D. Cal. Oct. 20, 2010)). In that litigation, Complainants asserted a total of eight patents, including the '087 patent. The Vizio litigation settled, [ ] CX-0794C. Complainants have addused

evidence showing that they incurred approximately [ ] in costs related to the Vizio litigation, including attorney fees and related expenses. Giving equal weight to each of the patents asserted in the Vizio litigation suggests an allocation of Complainants' investment to be approximately [ ] related to the '087 patent. CX-1595C (Kerr WS) at Q&A 402; CX-0806C (LSI Outside Counsel Expenses); CX-0795C (Vizio Legal Invoices Part 1); CX-0796C (Vizio Legal Invoices Part 2); CX-0797C (Vizio Legal Invoices Part 3); CX-0798C (Vizio Legal Invoices Part 4).

Finally, Complainants tried to license the asserted Winger '663 patent to SanDisk. CX-1189C. After receiving Complainants' letter requesting to meet to license the Winger '663 patent, San Disk filed a declaratory judgment action on, among other patents, the Winger '663 patent. CX-0100 (*SanDisk Corp. v. LSI Corp.*, No. 3:09-cv-02737-WHA, Complaint (N.D. Cal. June 19, 2009)). The litigation ended [ ] CX-0696C. In the course of defending the lawsuit brought by SanDisk, LSI incurred litigation expenses of approximately [ ] CX-1595C (Kerr WS) at Q&A 403-407; CX-0806C (LSI Outside Counsel Expenses); CX-0799C (SanDisk Legal Invoices Part 1); CX-0800C (Sandisk Legal Invoices Part 2). Giving an equal weight to each of the eight patents LSI asserted against SanDisk suggests that Complainants have spent approximately [ ] in litigation related costs per patent, including the '663 patent. CX-1595C (Kerr WS) at Q&A 407.

With respect to Complainants' overall investment in licensing the asserted patents, Dr. Kerr therefore estimates that Complainants have invested more than [ ] in recent years in employee-related costs, litigation costs, and travel expenses attributable to activities involving one or more of the asserted patents. CX-1595C (Kerr WS) at Q&A 380-470; CDX-1012C

(allocating [ ] to license the '087 patent, [ ] for the '958 patent, [ ] for the '867 patent, and [ ] for the '663 patent).

Respondents argue that Complainants have not shown that the claimed licensing expenses have the required nexus with the asserted patents. Resps. Br. at 534-40. As for the question of whether the amounts invested by Complainants are "substantial" such that they satisfy the domestic industry requirement of section 337, Respondents argue that Complainants have not shown "substantial" investment in licensing the asserted patents. *See* Resps. Br. at 523-34, 540-41. Respondents argue, *inter alia*, that Complainants' claimed employee costs are unsubstantiated, that Complainants' claimed travel expenses and costs are inflated, that Complainants cannot rely on their outside counsel litigation expenses, and that Complainants use inconsistent time periods to measure the alleged domestic industry. *See id.* at 523-532. Respondents' arguments, however, are not persuasive.

The evidence adduced by Complainants regarding licensing communications with third parties that specifically reference the asserted patents establishes that there is indeed a nexus between Complainants' investments in its licensing program and the asserted patents. With respect to the question of whether these investments are "substantial," the Commission has adopted "a flexible approach whereby a complainant whose showing on one or more of the three section 337(a)(3)(C) requirements is relatively weak may nevertheless establish that its investment is 'substantial' by demonstrating that its activities and/or expenses are of a large magnitude." *Navigation Devices* at 15. In this case, even looking to Dr. Kerr's conservative estimate of employee costs attributable to licensing the asserted patents—even excluding litigation expenses—one finds an investment of [ ]. This estimate excludes expenditures for other items such as litigation and travel costs. *See* CX-1595C (Kerr WS) at Q&A 343-470.

Under that more conservative estimate, Complainants' investments in the domestic exploitation of the asserted patents are still "of a large magnitude" and are, therefore, substantial.

Consequently, it is determined that the domestic industry requirement is satisfied under 19 U.S.C. § 1337(a)(3)(C).

C. [ ] Domestic Investments in Products Licensed from Complainants

Complainants also argue that they have shown that a domestic industry related to the asserted WiFi patents (*i.e.*, the '958 and '867 patent) is also established through Complainants' licensee [ ]") significant investments in plant, equipment, employment of labor, capital, engineering, and/or research and development in the United States relating to products that comply or are compatible with the IEEE 802.11b, 802.11g, and/or 802.11n standards. *See* Compls. Br. at 570-73.

The record evidence shows that [ ], entered into a licensing agreement with Complainants. CX-0036C ( ]). As part of that agreement, [ ] agreed to license [ ] The [ ] The [ ] license [ ] *See* CX-0758C ([ ]); CX-1508C ([ )]; CX-0759C ([ ]); CX-0760C ([ ]). Complainants state that they have received over [

] under the [ ] licensing agreement, and that they are due to receive [ ] Compls. Br. at 572.

The record evidence also shows that [ ] has significant investments in the United States relating to [ ] As [ ] corporate representative testified, all of [ ] licensed [ ] are in compliance or interoperable with any of the IEEE 802.11b, 802.11g, or 802.11n standards. *See* JX-028C ([ ] Dep.) at 30-31, 42-43; CX-649-58. [ ] recently represented to the Commission in its complaint for Inv. No. [ ] that [ ] currently employs [ ] people throughout the United States, including over [ ] facilities across the United States who are involved in engineering and research and development at an annual cost of over [ ]. *See* [.] The record evidence shows that approximately [ ] JX-028C ([ ] Dep.) at 102-104. [ ] has designed several licensed 802.11 compliant [ ] in the United States, including the [ ]. *Id.* [ ] employees in [ ] developed features and services for its Wi-Fi enabled [ ] JX-028C ([ ] Dep.) at 102-104.

With respect to [ ] WiFi products, Complainants argue that "[s]uch licensed products are, at minimum, more likely than not, and indeed highly likely, to infringe at least Claims 32 and 35 of the '958 Patent and Claims 20, 23-24, 26-28, 32-35, 37-40, 47, 49-52, and 58-61 of the '867 Patent." Compls. Br. at 572 (citing CX-1643C (Negus RWS) at Q&A 11; Q&A 42). Complainants further argue: "Accordingly, [ ] licensed products are highly

likely to infringe Claims 32 and 35 of the '958 Patent and Claims 20, 23-24, 26-28, 32-35, 37-40, 47, 49-52, and 58-61 of the '867 Patent and, therefore, satisfy the technical prong of the domestic industry requirement." *Id.* It is argued that "a domestic industry exists with respect to the asserted WiFi patents (the '958 and '867 Patents) through the significant domestic investments made by licensee [ ] in plant, equipment and labor in the research, design, and development of articles ([ ]) that practice the asserted WiFi patents." Compls. Br. at 573.

Complainants, however, have not adduced evidence to show that the [ ] products in question satisfy the technical prong with respect to the '958 and '867 patents. Complainants instead generally allege, without evidentiary support, that [ ] has 802.11 compliant products that are "more likely than not" and "highly likely" to practice the Wi-Fi patents at issue. *See* Compls. Br. at 573. Such a statement is not enough to prove that the [ ] products practice the '958 and '867 patents. Therefore, it is determined that Complainants have not shown that the domestic industry requirement is satisfied based on [ ] investments in the United States.

X. Unenforceability

Respondents argue that the '663, '958 and '867 patents are unenforceable. The administrative law judge has determined that no infringement has been established with respect to the asserted claims of those patents. Thus, it will not be necessary to determine whether those patents are unenforceable, unless some or all of the non-infringement findings are reversed. Consequently, the following analysis of Respondents' unenforceability affirmative defenses is provided in the alternative. Respondents argue that the '663, '958 and '867 patents are unenforceable, as follows:

> Respondents argue that Complainants have breached their RAND[68] (*i.e.*, reasonable and non-discriminatory) obligations with respect to the '663 patent rendering it unenforceable against Funai.[69] GR12 Filing at 9.
>
> Respondents argue that Complainants have breached their RAND obligations with respect to the '958 patent, rendering it unenforceable against either Funai or Realtek. GR12 Filing at 15.
>
> Respondents argue that Complainants are contractually and/or equitably estopped from asserting the '958 patent and/or seeking an exclusion order. GR12 Filing at 15.
>
> Respondents argue that Complainants' predecessor Lucent breached a duty to disclose U.S. Pat. App. No. 09/064,188 to the IEEE, rendering the '958 patent unenforceable. GR12 Filing at 15.
>
> Respondents argue that Complainants are equitably estopped from asserting the '958 patent against Realtek. GR12 Filing at 15.
>
> Respondents argue that Complainants have breached their RAND obligations with respect to the '867 patent, rendering the patent unenforceable against Funai and Realtek. GR12 Filing at 44.
>
> Respondents argue that Complainants are contractually and/or equitably estopped from asserting the '867 patent and/or seeking an exclusion order. GR12 Filing at 44.
>
> Respondents argue that Complainants' predecessor Lucent breached a duty to disclose U.S. Pat. App. No. 08/155,661 to the IEEE, rendering the '867 patent unenforceable. GR12 Filing at 44.
>
> Respondents argue that Complainants are equitably estopped from asserting the '867 patent against Realtek. GR12 Filing at 44.

Thus, Respondents' unenforceability arguments form the following categories: (A) Failure to Satisfy RAND Obligations; (B) Contractual and/or Equitable Estoppel; (C) Breach of Duty to

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[68] The terms RAND and FRAND (*i.e.*, fair, reasonable and non-discriminatory) appear to be used interchangeably in the record and in case law.

[69] As discussed above, the '663 patent is asserted only against Funai.

Disclose SEPs (*i.e.*, standard-essential patents) to the IEEE (*i.e.*, Institute of Electrical and Electronics Engineers); and (D) Equitable Estoppel As to Realtek.[70]

A. RAND Obligations; Contractual and/or Equitable Estoppel

1. Summary of the Parties' Arguments

In section XI of their post-hearing brief, Respondents detail their RAND defenses, which concern the '958, '867 and '663 patents. Resps. Br. at 543-62. The aforementioned patents must be SEPs in order for any RAND obligations to arise.[71] Accordingly, Respondents begin their RAND-specific defenses by arguing that the '958, '867 and '663 patents are, in fact SEPs, and that Complainants do not deny their RAND obligations in connection with these patents. *Id.* at 554; Resps. Reply at 157. Specifically, it is argued that the '663 patent is required to practice the ITU-T H.264 standard, and that the '958 and '867 patents are necessary to practice the IEEE 802.11 Wi-Fi standard. Resps. Br. at 544. Furthermore, it is argued that all three patents are encumbered by RAND obligations. With respect to the '663 patent, Respondents argue that LSI's predecessor-in-interest declared to the ITU that it would grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions. *Id.* With respect to the '958 and '867 patents, Respondents argue that Agere promised the IEEE that it would grant a license to an unrestricted number of applicants on a worldwide nondiscriminatory basis and on reasonable terms and conditions. *Id.* Respondents further argue that the commitments to provide RAND licenses are irrevocable during the life of

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[70] Respondents' arguments in category (B) are included in the same portion of their brief relating to their RAND defenses (A), and indeed their related contractual and/or equitable estoppel arguments follow from alleged failures to meet RAND obligations. *See* GR 12 Filing at 15, 44; Resps. Br. at 555. Categories (A) and (B) are, therefore, addressed together, below.

[71] Respondents' arguments concerning Complainants' alleged breach of a duty to disclose SEPs to the IEEE are addressed separately in Respondents' brief, and are addressed separately below.

the standards. *Id.* at 544-45 (citing, *inter alia*, *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872, 884 (9th Cir. 2012) and *Microsoft Corp. v. Motorola, Inc.*, 854 F. Supp. 2d 993, 999 (W.D. Wash. 2012)).

Respondents state, "[a]rguably Complainants waived their right to request an exclusion order relief by entering into a contract to license their standard essential declared patents on RAND terms." Resps. Br. at 546 (citing, *inter alia*, *Microsoft*, 696 F.3d at 884 (9th Cir. 2012) ("Moreover, even if Motorola did not breach its contract, then, however the RAND rate is to be determined under the ITU standards, injunctive relief against infringement is arguably a remedy inconsistent with the licensing commitment.") and *Microsoft Corp. v. Motorola, Inc.*, No. 10-1823, 2012 WL 5993202, at *6 (W.D. Wash. Nov. 30, 2012)). They argue, "At a minimum, however, [Complainants] cannot breach those contracts and obtain the relief sought here." *Id.*

Respondents argue that, in general, Complainants' RAND position is untenable, and that the testimony of Complainants' expert is flawed. Resps. Br. at 546-48. It is argued that Complainants' RAND position makes no sense because it does not account for licensing terms actually agreed to by Complainants, [

] Resps. Reply at 158. More specifically, Respondents argue that Complainants' offers to Realtek and Funai are inconsistent with determined RAND rates for the standards at issue. They argue that Complainants have made "blatantly unreasonable" offers that violate RAND obligations. Respondents point to the fact that Complainants made [

]" offers to Funai and Realtek ([

] Thus, it is argued, for a [ ] television, this would result in a "RAND" royalty of

[ ] to Complainants. Yet, Respondents argue, in litigation involving other parties and patents, but the same standards, a district court has found that a true RAND rate would be between 0.555 and 16.389 cents per unit, and a RAND rate for the eleven 802.11 patents was between 0.8 and 19.5 cents per unit. Respondents argue that the Commission should decline to enforce the patents at issue. Resps. Br. at 546, 548-50, 558 (citing *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR (W.D. Wash. Apr. 25, 2013)). Respondents also make separate arguments specific to Realtek, and specific to Funai.

With respect to Realtek, Respondents argue that in addition to [

] Resps. Br. at 550 (quoting RX-1326C). Respondents argue that [

] *Id.* at 551 (citing CX-1330C).

Indeed, [

] Further, it is argued that [

] Resps. Br. at 551-52; Resps. Reply at 162-63. An offer such as that of Complainants, Respondents argue, also discriminates against Realtek because it

[ ] They argue that

[

] Resps. Br. at 552-53 (citing RX-0010C (Carmichael WS) at Q&A 199-203; RX-1876C ([ ]); RX-1316C ([

]); RX-1135C ([ ])).

Respondents argue that, in fact, [ ] It is argued that [

] Resps. Br. at 554 (citing RX-0010C (Carmichael WS) at Q&A 136, 146-147; CX-1599C (Waskiewicz WS) at Q&A 231; Waskiewicz Tr. 181-182; Carmichael Tr. 1480-1481). In fact, they argue, [

] *Id.* at 554-55 (citing RX-1324C ([

])).

Respondents draw upon concepts both of contract and estoppel law. They argue that Realtek is a third-party beneficiary to all entities, including Agere, [

] Resps. Br. at 555 (citing *Microsoft*, 696 F.3d at 884 (cited for the proposition that Motorola's contract with the ITU is enforceable by Microsoft, a third-party beneficiary); *Microsoft*, 854 F. Supp. 2d at 999 (cited for the proposition that Microsoft, as a member of the IEEE, was a third-party beneficiary of Motorola's commitments to the IEEE); *ESS Tech., Inc. v. PC–Tel, Inc.*, No. C-99-20292 RMW, 1999 WL 33520483, at *4 (N.D. Cal. Nov. 4, 1999) (cited for the proposition that the third-party beneficiary of contract between an

SSO and the defendant, who held essential patents, had properly stated a claim for specific performance of the agreement requiring the defendant to license patents on RAND terms)).

It is further argued that [

] Resps. Br. at 555-56 (citing RX-0011C (Chen WS) at Q&A 37-38; RX-1327C (List of Realtek Patents and Patent Applications); RX-1328C (Realtek Sales Data) [ ]

Respondents argue that Complainants reneged on their RAND commitments by [

] and further, even though [

] Complainants' refusal to license Realtek, as well as a "blatantly unreasonable license offer," it is argued, each constitutes a breach of Complainants' agreement to license the '958 and '867 patents to all applicants on RAND terms. Respondents request that it be found that the '867 and '958 patents are unenforceable and/or that Complainants are estopped from obtaining relief based on those patents. Resps. Br. at 561-62, 556.

With respect to Funai, Respondents argue that Complainants and Funai [

] and that Funai relied during this period on Complainants' obligations as holders of purportedly standards-essential patents to offer RAND licenses to those patents and expected RAND terms to be offered to it. Resps. Br. at 556-57. It is argued that Complainants never made Funai an offer consistent with their RAND

obligations, and that "[s]uch behavior constitutes both unclean hands and patent misuse, rendering the '958, '867 and '663 patents unenforceable against Funai."[72] *Id.* It is argued that "Complainants have unclean hands, because their failure to offer RAND terms represents unconscionable acts that injured Realtek and Funai and took unfair advantage of the purported standards-essential nature of the patents." *Id.* (citing *New Valley Corp. v. Corp. Prop. Assocs. 2 & 3 (In re New Valley Corp.)*, 181 F.3d 517, 522-23 (3d Cir. 1999). It is argued that "Complainants have misused their standards-essential patents by seeking impermissibly to broaden their physical or temporal scope with anticompetitive effect. *Id.* (citing *Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1339 (Fed. Cir. 2006)). Specifically, it is argued, "Complainants insist that licensees pay their royalties [

]" Further, Respondents argue, "[c]omplainants' unclean hands and misuse of the standard-essential patents nullifies their ability to enforce them in this investigation." *Id.* at 557.

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[72] In order for competitive behavior to amount to patent misuse, one must impermissibly broaden the scope of the patent grant with anticompetitive effect. *Monsanto Co. v. Scruggs*, 459 F.3d 1328, 1339 (Fed. Cir. 2006). While there are some specific practices that have been identified by the courts as constituting patent misuse *per se*, allegedly anticompetitive practices are often evaluated under the "rule of reason" to determine whether they impose an unreasonable restraint on competition. *U.S. Philips Corp. v. Int'l Trade Comm'n*, 424 F.3d 1179, 1185 (Fed. Cir. 2005). Patent misuse, which is an extension of the doctrine of unclean hands, must be proven by clear and convincing evidence. *See B. Braun Med., Inc. v. Abbot Labs.*, 124 F.3d 1419, 1427 (Fed. Cir. 1997); *In re Omeprazole Patent Litig.*, 483 F.3d 1364, 1374 (Fed. Cir. 2007).

Respondents offer little legal analysis in their brief of the facts vis-à-vis the legal doctrines of unclean hands and patent misuse. Indeed, Complainants argue that Respondents present some of their unenforceability arguments as a moving target. *See* Compls. Br. at 364-65 n.53, 442 n.68. The administrative law judge was not a party to the exchanges among counsel that are discussed by Complainants. Nevertheless, there is discontinuity among Respondents' prehearing briefing, the parties' joint Ground Rule 12 Filing (which, for example, does not mention a specific patent misuse defense), and Respondents' post-hearing brief.

More specifically, with respect to Funai and the '663 patent, Respondents argue that the rate offered to Funai overvalues the patent and is therefore unreasonable. Indeed, it is argued, based on expert testimony, that "the value of the '663 patent would have been zero or close to zero." Resps. Br. at 558. With respect to Funai and the '958 and '867 patents, it is argued that the rate offered to Funai was discriminatory because the only offer made by LSI and Agere to Funai, [ ] for Funai's products; yet, even assuming [ ] royalty rate were reasonable (which Respondents do not) it was much higher than rates previously agreed to between Agere and [ ] *Id.* at 558-61.

Complainants oppose any finding that they have failed to satisfy RAND obligations with respect to any asserted patent, or that the asserted patents are unenforceable for any other reason.[73] They oppose any finding that the '958 and '867 patents are unenforceable due to breach of contract, equitable estoppel or any other legal theory set forth by Respondents. *See* Compls. Br. at 422-53, 542; Compls. Reply at 157-63, 164-70. They oppose any finding that the '663 patent is unenforceable. *See* Compls. Br. at 364-68; Compls. Reply at 157-64.

With respect to the '958 and '867 patents and the potential licensing of Funai, Complainants argue that LSI provided Funai with its [ ] RAND proposal for its entire WLAN patent portfolio, which includes the '958 patent and the '867 patent. It is argued that the evidence demonstrates that [

[73] Respondents do not allege that the '087 patent (asserted against Funai) is unenforceable. *See* GR12 Filing; Compls. Br. at 200 (citing CX-0905C (Funai Answer to Amended Complaint), CX-0906C (Funai Amended Answer to Amended Complaint), and CX-0917C (Funai Answer to 2nd Amended Complaint)).

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Compls. Br. at 439 (citing, *inter alia*, CX-1599C (Waskiewicz WS) at Q&A 36-37, Q&A 112-144, Q&A 139-40; Waskiewicz Tr. 157-62, 177, 182, 192-193 200-201; Carmichael Tr. 1435; CX-0348C ([ ]) at 2-3; CX-0349C ( ] [ ]) at 14-16; CX-1078C ([ ]) at 19; CX-1006C ([ ]).

For example, Complainants argue, LSI's initial proposal to [ ] was the same as the proposal that LSI made to Funai [ ] Like Funai, it is argued, [ ] sells televisions that contain 802.11 wireless LAN functionality. Yet, it is argued, unlike Funai,[ ] negotiated a license to LSI's WLAN patent portfolio. Consequently, it is argued, the evidence demonstrates that LSI's initial RAND WLAN proposal to Funai was a non-discriminatory and reasonable starting point for further licensing negotiations. Compls. Br. at 439-40 (citing Leonard Tr. 1393, 1396-1401; CX-0348C ([ ]) at 2-3; CX-0349C ([ ]) at 16; CX-1084C ([ ]) at 88; CX-0349C ([ ]) at 16; CX-1642C (Kerr RWS) at Q&A 55-56; CX-1634 ([ ]); CX-1599C (Waskiewicz WS) at Q&A 73-85; CX-1115C ([ ]) at 2, 19-21, 27-35).

Complainants argue that Funai has failed to establish that the proposed terms of LSI's opening RAND proposal for its WLAN patent portfolio, which includes the '958 patent and the '867 patent, were an unreasonable starting point for negotiations. In fact, they argue, LSI's initial proposal to Funai contained [ ] which was well within the range of [ ]royalty rates contained in the license agreements negotiated by

[ ] Compls. Br. at 440-41 (citing Leonard Tr. 1345, 1348-1350, 1356-1362; 1398-1401; CX-0349C ([ ]) at 16; CX-0349C ([ ]) at 16)). In fact, it is argued, [ ], offered to Funai, is a reasonable starting point for negotiations as demonstrated by LSI's license with [ ], which negotiated a license to the '958 and '867 patents for various products, including TVs with 802.11 wireless LAN functionality, after receiving LSI's opening RAND WLAN license proposal. Additionally, Complainants reiterate that LSI has successfully negotiated several other licenses after providing its[ ] RAND WLAN proposal to potential licensees. Compls. Br. at 441 (citing, *inter alia*, CX-1599C (Waskiewicz WS) at Q&A 9-23, Q&A 38-39, Q&A 73-85; CX-1115C ([ ]) at 2, 19-21, 27-35; CX-1642C (Kerr RWS) at Q&A 22-82, Q&A 100; CX-1598C (Salute WS) at Q&A 104-194, Q&A 213-539).

Furthermore, Complainants argue, a comparison between high-level terms of an opening proposal and the final terms of executed licenses is insufficient because there are several substantial terms in the executed license agreements, which were negotiated based on the specific considerations of each licensee. Compls. Br. at 441 (citing, *inter alia*, CX-1599C (Waskiewicz WS) at Q&A 145-173; CX-1642C (Kerr RWS) at Q&A 117-130; Leonard Tr. 1356; Carmichael Tr. 1446-1451, 1457-1459; Kerr Tr. 2048-2049, 2055-2056 2113-2115; CX-0035C ([ ] PLA) at 19, 20; CX-0028C ([ ] PLA) at 6-8). For example, it is argued, the [ ] license agreements do not include TVs, such as those sold by Funai or [ ], as licensed products, and the final negotiated terms of the [ ] licenses are also very different from one another. Compls. Br. at 440 (citing, *inter alia*, Leonard Tr. 1354-1356; CX-1642C (Kerr RWS) at Q&A 117-130; CX-1599C (Waskiewicz WS)

at Q&A 162-173; Carmichael Tr. 1446-1459. Thus, Complainants argue, even if a comparison to [ ] licenses were proper, the evidence shows that an opening [ ] royalty rate of [ ] is an objectively reasonable opening proposal in view the [ ] royalty rates contained in the [ ]) license agreements, and because it was possible that the final [ ] royalty rate for Funai could have been lower than [ ] through further negotiations. *Id.* at 442.

With respect to the '958 and '867 patents and specifically the potential licensing of Realtek, Complainants argue that [

.] Compls. Br. at 444 (citing CX-1599C (Waskiewicz WS) at Q&A 114-144; CX-1058 [ ]; CX-1006C ([ ])). It is argued that LSI's [ ] RAND WLAN proposal [

]" *Id.* at 444-45 (citing CX-1599C (Waskiewicz WS) at Q&A 224-228; CX-1006C ([ ]) at 2).

Complainants argue that in response, [ ] even though the negotiation of a RAND license contemplates "give-and-take" negotiation between the patent holder and potential licensee. Compls. Br. at 445 (citing Leonard Tr. 1337-1338; *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2012 WL 2030098, at *11 (W.D. Wash. June 6, 2012) ("[T]he language of Motorola's agreements with the IEEE . . . envisions a negotiation between the parties towards a resulting RAND license.")). It is argued that [

] *Id.* at 445-46 (citing CX-1599C (Waskiewicz WS) at Q&A 235- 237; Waskiewicz Tr. 202-203; Carmichael Tr. 1465-1469; Chen Tr. 1283-1284). Complainants argue that on this basis alone, [ ] should defeat Realtek's affirmative defense premised on the allegation that LSI breached its RAND obligations. *Id.* at 446.

Further, it is argued, Realtek failed to introduce any evidence as to what would constitute RAND terms in either an opening proposal or an executed license, and indeed, Mr. Carmichael (Realtek's expert) testified that he did not offer an opinion as to the rate or terms of a RAND license. Moreover, it is argued, LSI's opening proposal to Realtek is not discriminatory because LSI [ ]. Compls. Br. at 446-47 (citing Carmichael Tr. 1425-1426, 1431, 1431-1436, 1461; CX-1599C (Waskiewicz WS) at Q&A 112-144; Waskiewicz Tr. 157-162, 177, 182, 192-19, 200-201; Leonard Tr. 1380-1383, 1393, 1398-1399; CX-1642C (Kerr RWS) at Q&A 68-70, Q&A 117-118, Q&A 121, Q&A 122; CX-0348C ([ ]) at 2-3; CX-0349C ([ ]) at 14-16; CX-1078C ([ ]) at 19; CX-1006C ([ ]) at 13). Thus, Complainants argue, LSI's proposal is a reasonable starting point for good faith negotiations, and rather than being a "take-it-or-leave-it" offer, in fact, the terms and structure of this initial high-level proposal have not been viewed as non-negotiable by LSI's licensees, as LSI has successfully negotiated numerous final licenses after opening with this [ ] offer. *Id.* at 446 (citing, *inter alia*, CX-1599C (Waskiewicz WS) at Q&A 38-89; CX-1642C (Kerr RWS) at

Q&A 22-82, Q&A 100; CX-1598C (Salute WS) at Q&A 104-194, Q&A 213-539; CX-1115C ([ ]) at 2, 19-21, 27-35; Leonard Tr. 1393-1401; CX-0348C ([ ]) at 2-3; CX-0349C ([ ]) at 16; CX-1084C ([ ]) at 88); CX-0035C ([ ] PLA); CX-525C (Kerr Report Ex 4); CX-0526C (Kerr Report Ex 5); CX-0349C ([ ]) at 16)).

Complainants also argue that the reasonableness of LSI's initial proposal is also illustrated by [ ]. For example, it is argued, LSI's opening proposal [ ]. Compls. Br. at 447-48 (citing, *inter alia*, CX-1599C (Waskiewicz WS) at Q&A 216-217; CX-1006C ([2]) at 10-13; CX-0348C ([ ]) at 2-3; CX-0349C ([ ]) at 16; CX-1084C ([ ]) at 88; CX-1006C ([ ]) at 9; CX-0349C ([ ]) at 16)).

Further, Complainants contend, LSI has established a long history of engaging in good faith licensing negotiations, including several licenses with grants to the '958 and '867 patents. Compls. Br. at 448 (citing, *inter alia*, CX-1599C (Waskiewicz WS) at Q&A 38-89; CX-1599C (Waskiewicz RWS) at Q&A 13-14, Q&A 6-61; CX-1642C (Kerr RWS) at Q&A 22-82, Q&A 100; CX-1598C (Salute WS) at Q&A 104-194, Q&A 213-539; CX-525C (Kerr Report Ex 4); CX-0526C (Kerr Report Ex 5); CX-758C ([ ]) at 2; CX-36C ([ ] PLA) at 3, 4, 18; CX-37C ([ ] PLA Amendment) at 2; CX-762C ([

]) at 22; CX-763C ([ ]) at 19; CX-27C ([ ] PLA) at 3-4, 13-15; CX-765C ([ ]) at 15-24; CX-766C ([ ]) at 4; CX-1557C ([ ]) at 80-119; CX-768C ([ ]) at 86-94, 103; CX-38C ([ ] PLA) at 14-17; CX-1115C ([ ]) at 2, 19-21, 27-35).

Complainants argue that [ ] rings hollow because Realtek could have engaged LSI in negotiations concerning this proposed term and any others to arrive at a license that addressed Realtek's specific licensing needs. Compls. Br. at 448. It is argued that even assuming as true [ ] such a provision is not inherently unreasonable. For example, Complainants argue, in *Hanson v. Alpine Valley Ski Area, Inc.*, the Federal Circuit held that a patent royalty to an infringer's snow-blowing machines was reasonable even though the royalty exceeded the purchase price of another company's machines that were actually licensed by the patentee. *Id.* at 449-50 (citing *Hanson v. Alpine Valley Ski Area, Inc*,718 F.2d 1075, 1081-82 (Fed. Cir. 1983); *Stickle v. Heublein, Inc.*, 716 F.2d 1550, 1563 (Fed. Cir. 1983) ("[W]e expressly reject Heublein's premise that the royalty fee must be less than the price of an HUB-2000."); *Rite-Hite Corp. v. Kelley Co.*, 56 F.3d 1538, 1555 (Fed. Cir. 1995) (en banc); *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221, 1238-39 (Fed. Cir. 2011) (explaining a reasonable royalty is not capped by infringer's profits or the sales price of the patented product)).

Complainants argue that Realtek's claim that [ ] also misses the mark because LSI has in fact licensed WLAN patents to [ ] Compls. Br. at 449 (citing CX-1599C (Waskiewicz WS) at Q&A 230-234; Waskiewicz Tr. 178; Carmichael Tr. 1464; CX-0035C ([ ] PLA); CX-39C ([ ] PLA); CX-668C ([ ] PLA)). It is argued that notwithstanding LSI's [ ], which includes the '987 patent and '867 patent, LSI will consider the specific concerns and unique needs of each potential licensee when engaged in licensing negotiations. *Id.* at 450 (citing Waskiewicz Tr. 174, 177, 182, 193-194, 201-202; Kerr Tr. 2048-2049, 2055-2056, 2113-2115; CX-1599C (Waskiewicz WS) at Q&A 145-173, Q&A 224-230; CX-1642C (Kerr RWS) at Q&A 117-130; CX-0035C ([ ] PLA) at 19, 20; CX-0028C ([ ] PLA) at 6-8). It is argued that at the hearing, Realtek was unable to identify a single instance in which LSI had refused to license the '985 patent or the '867 patent [ ]. *Id.* at 451 (citing Carmichael Tr. 1464).

In fact, Complainants argue, LSI's proposal to Realtek [ ]" Compls. Br. at 450 (quoting CX-1006C ([ ]) at 9). It is argued that LSI's proposal was not a "take it or leave it" offer, and made clear that LSI was willing to have a subsequent discussion with Realtek. Yet, Complainants argue, Realtek [ ] *Id.* (citing, *inter alia*, Waskiewicz Tr. 202-203; Chen Tr. 1283-1284). Instead, it is

argued, [

] *Id.*

Complainants argue that in this investigation, Realtek has conducted a faulty and cursory comparison between only the [ ] royalty rate outlined in LSI's initial [ ] RAND WLAN proposal, the [ ] royalty rate in the [ ] license, and the [ ] royalty rate in the [ ] license. Yet, it is argued, a comparison between high-level terms of an opening proposal and the final terms of executed licenses is insufficient because there are several substantial terms in the executed license agreements which were negotiated based on the specific considerations of each licensee. Compls. Br. at 452 (citing CX-1599C (Waskiewicz WS) at Q&A 145-173; CX-1642C (Kerr RWS) at Q&A 117-130; Kerr Tr. 2048-2049, 2055-2056, 2113-2115; CX-0035C ([ ] PLA) at 19, 20; CX-0028C ([ ] PLA) at 6-8).

Further, Complainants argue, the other final negotiated terms of the [ ] licenses are also very different from one another. It is also argued that even if a comparison to the [ ] licenses were proper, Realtek's theory should be rejected because Mr. Carmichael did not offer an opinion that the [ ] licenses constituted RAND licenses. Compls. Br. at 452 (citing CX-1642C (Kerr RWS) at Q&A 117-130; CX-1599C (Waskiewicz WS) at Q&A 162-173; Carmichael Tr. 1431-1433).

Complainants argue that the evidentiary record does not establish that Realtek reasonably relied on any conduct by Complainants that caused Realtek to change or worsen its position or actions. It is argued that Realtek's witness [ ] made clear that [

] Compls. Br. at 453 (citing [ ] 1261-1262 ([

]; [

] It is argued that

[ ] also testified that [

] *Id.* (citing [ ] Tr. 1263-1264,

1267-1268, 1283, 1287 [

] Thus, Complainants

argue, Realtek has not demonstrated that it reasonably relied on Complainants' conduct. *Id.*

With respect to the '663 patent, which is asserted only against Funai, Complainants argue that Funai failed to introduce any evidence as to what would constitute RAND terms in either an opening proposal or executed license, and Dr. Leonard testified that he did not offer an opinion as to the rate or terms of a RAND license between Funai and LSI. Compls. Br. at 365 (citing Leonard Tr. 1335). Instead, it is argued, Funai's defense merely represents Funai's dislike of LSI's opening licensing proposal, which is a starting point for negotiations, and is not viewed by LSI as a "take it or leave it" offer. *Id.* at 366 (citing Waskiewicz Tr. 193-194, 201-202; Carmichael Tr. 1470).

Complainants argue that far from refusing to license Funai or to negotiate beyond LSI's opening offer, [

] Compls. Br. at 366 (citing CX-1599C (Waskiewicz WS) at Q&A 90-129; Waskiewicz Tr. 191-193; Leonard Tr. 1339-1341; CX-1145C ([ ]); CX-0341C ([ ]) at 5, 7; CX-0345C ([ ]) at 42; CX-0348C ([ ]); CX-0349C ([ ]); RX-978C ([ ]) at 42)). It is argued that the negotiation of a RAND license contemplates a "give-and-take" negotiation between the

patent holder and potential licensee. *Id.* (citing Leonard Tr. 1337-1338; *Microsoft*, No. C10-1823, 2012 WL 2030098, at *11 ("[T]he language of Motorola's agreements with the IEEE . . . envisions a negotiation between the parties towards a resulting RAND license.")). In fact, Complainants argue, the evidence demonstrates that LSI has a history of engaging in good faith patent licensing negotiations, and has concluded several resulting licenses with grants to the '958 and the '867 patent, as well as the '663 patent. *Id.* at 366-67 (citing CX-1599C (Waskiewicz WS) at Q&A 38-89; CX-1599C (Waskiewicz RWS) at Q&A 13-14, Q&A 56-61; CX-1642C (Kerr RWS) at Q&A 22-82, Q&A 100; CX-1598C (Salute WS) at Q&A 104-194, Q&A 213-539; CX-525C (Kerr Rpt. Ex 4); CX-0526C (Kerr Rpt. Ex 5); CX-758C ([[) at 2; CX-36C ([ ] PLA) at 3, 4, 18; CX-37C ([ ] PLA Amendment) at 2; CX-762C ([ ]) at 22; CX-763C ([ ]) at 19; CX-27C ([ ] PLA) at 3-4, 13-15; CX-765C ([ ]) at 15-24; CX-766C ([ ]) at 4; CX-1557C ([ ]) at 80-119; CX-768C ([ ]) at 86-94, 103; CX-38C ([ ] PLA) at 14-17; CX-1115C ([ ]) at 2, 19-21, 27-35).

Complainants argue that no evidence supports the assertion that LSI's licensing proposal was discriminatory or unreasonable with respect to the '663 patent. In particular, it is argued that Funai did not introduce sufficient evidence to substantiate its claim that LSI breached a RAND obligation with respect to the '663 patent. Compls. Br. at 367-68. It is argued that Funai's expert, Dr. Leonard, did not compare LSI's [ ] licensing proposal to Funai regarding the '663 patent with any other proposals or offers LSI made to other potential licensees for the '663 patent; and that likewise, he did not compare LSI's [ ] licensing

proposal to Funai regarding the '663 patent with any existing LSI licenses, which included a license to the '663 patent. It is argued that Dr. Leonard admitted that his testimony did not discuss or provide an evaluation of LSI's existing licenses to the '663 patent. *Id.* (citing Leonard Tr. 1381, 1383-1384; CX-0349C ([ ])). Thus, it is argued, Dr. Leonard provided no viable testimony that supports Funai's assertions that LSI's [ ] proposal to Funai was discriminatory or unreasonable with respect to the '663 patent, and did not offer an opinion as to what terms of a hypothetical license between Funai and LSI would constitute a RAND license. *Id.* at 368 (citing, *inter alia*, CX-1642C (Kerr RWS) at Q&A 108-116).

Instead, Complainants argue, the only supposed evidence that Funai attempted to offer with respect to the '663 patent was the legally insufficient and factually unsubstantiated testimony of Dr. Leonard regarding a purported alternative technology to the '663 patent. Moreover, they argue, Dr. Leonard testified that he had not provided any technical analysis or evaluation of any potential technical alternatives to the '663 patent. In addition, it is argued, Dr. Leonard is not qualified to provide opinions regarding whether technical alternatives to the '663 patent exist. Dr. Leonard has never provided an infringement or invalidity opinion in a patent case; and he was not received as an expert on technical issues relating to the '663 patent or any alternative technologies. Compls. Br. at 368 (citing Leonard Tr. 1325, 1384-1385). Nevertheless, Complainants argue, they presented evidence from a qualified technical expert (Dr. Iain Richardson) to establish that Dr. Leonard's testimony alluding to the possibility of a purported technical alternative to the '663 patent was incorrect. *Id.* (citing CX-1644C (Richardson RWS) at Q&A 535-41).

Thus, Complainants argue, as they do with respect to the '867 and '958 patents, there is no basis to find the '663 patent unenforceable under the doctrine of patent misuse or any other legal theory. Compls. Br. at 368.

2. Discussion and Ruling

Complainants do not dispute that the '867, '958 and '663 patents are SEPs, and that they or their predecessor-in-interest agreed to RAND obligations that remain in effect. Thus, based on Respondents' defenses, issues remain as to whether the '867 and '958 patents are unenforceable as to Realtek and Funai due the breach of RAND obligations, and whether Complainants are equitably and/or contractually estopped from enforcing the '867 and '958 patents; similar issues remain as to the '663 patent, but only as to Funai, inasmuch as it is not asserted against Realtek.

It is a respondent's burden to show by a preponderance of the evidence that a RAND defense precludes the Commission from finding a violation of section 337. *Certain Electronic Devices, Including Wireless Communications Devices, Portable Music and Data Processing Devices, and Tablet Computers*, Inv. No. 337-TA-794 ("*Wireless Communications Devices*"), Comm'n Op. at 46 (July 5, 2013).

As recently observed by the Commission, "[t]he Commission and its ALJs have never adopted [respondent's] theory that a FRAND undertaking *per se* precludes a determination of violation." *Wireless Communications Devices*, Comm'n Op. at 46. To do so would appear contrary to statutory authority, which almost always requires the Commission to determine whether or not section 337 has been violated in each investigation, without regard to whether or not an asserted patent is an SEP. *Id.* (citing 19 U.S.C. § 1337(c)).

There is no authority for the argument that a patent holder must make an initial offer for a specific fair and reasonable royalty rate. *Wireless Communications Devices*, Comm'n Op. at 60. Indeed, the limited precedent on the issue appears to indicate that an initial offer need not be the terms of a final FRAND license because SSOs intend the final license to be accomplished through negotiation. *Id.* (citing *Microsoft v. Motorola*, 864 F. Supp. 2d 1023, 1038 (W.D. Wash. 2012) (because SSOs contemplated that RAND terms be determined through negotiation "it logically does not follow that initial offers must be on RAND terms")).

Respondents' RAND-related defenses are based on Complainants' opening offer. Furthermore, although their defenses are based on an argument that Complainants demanded an unreasonable and discriminatory royalty rate, and despite having discovery relating to existing LSI licenses, Respondents did not introduce any evidence as to what would constitute a RAND license or RAND royalty rates with respect to the '958, '867 or '663 patents. *See* Leonard Tr. 1335, 1425-1426. Yet, a finder of fact should usually compare offers with a RAND royalty rate because more than one rate could conceivably be within the range of reasonable and non-discriminatory license terms. *See Microsoft*, No. C10-1823JLR, at 5 (W.D. Wash. Apr. 25, 2013).

The April 25, 2013 district court order in *Microsoft v. Motorola* did not necessarily set RAND royalty rates for the IEEE and ITU. *See id.* at 2-8, 207. The district court in that case determined RAND rates specifically for Motorola's SEP portfolios for the respective standards, which were not rates for either the 802.11 or H.264 standards themselves. *Id.* Specifically, the RAND rates for Motorola's patents were determined within a framework that evaluated several factors, including the importance of Motorola's patents to the standards, and the importance of Motorola's patents and the standards to the Microsoft products at issue. *Id.* at 7. In contrast,

Respondents did not offer a similar analysis for the SEPs asserted in this investigation. *See* Leonard Tr. 1335; Carmichael Tr. 1425-1426. Further, Motorola's opening offer with a 2.25% royalty rate was [ ] LSI's opening offer [ ]. *See* Leonard Tr. 1350. Additionally, licensing negotiations involving SEPs may include layers of complexity beyond determining monetary royalty rates. *See Microsoft*, No. C10-1823JLR, at 6 (W.D. Wash. Apr. 25, 2013). Motorola's opening offer rate to Microsoft is not comparable or similar because, among other reasons, it involved different patent portfolios, different products, and different parties.

Indeed, to consider only LSI's opening proposal of a [ ] royalty rate may be misleading because when the offered rate [ ] with reference to the accused Funai products, [ ], as explained during the hearing, in part as follows:

> Q. So the actual rate that's being offered by LSI to Funai is [ ]; isn't that correct?
>
> A. On the products, that's being discussed here, that's being applied to the television.
>
> Q. And that's the rate that matters, correct? They are not asking Funai to pay [ ] on a television. They are asking them to pay [ ]. Isn't that correct?
>
> A. That is correct, but, of course—
>
> Q. That's all I want to know. Isn't that correct?
>
> A. Yes.
>
> Q. It is not [ ]it is not [ ]?
>
> A. That's -- they are asking for [ ] on a TV or other devices.
>
> Q. Okay. [ ]. We agree on that. That's the actual royalty rate of this initial proposal?
>
> A. Yes, absolutely.

Leonard Tr. 1350. This rate is also substantiated by documentary evidence. *See* CX-0349C ([ ]) at 16; CDX-1213C (CX-1084C ([ ]) at 88; CX-0349C ([ ]) at 16.

Funai's claim that LSI overvalued the '663 patent is not supported by evidence. Respondents' expert miscalculated the value of the '663 patent because he made an erroneous comparison to what he believed to be the next-best alternative technology. He believed that the next best alternative to the '663 patent is '087 patent. *See* RX-0009C (Leonard WS) at Q&A 24-28, Q&A 202-205. Yet, Respondents' RAND expert is not a technical expert.[74] Moreover, the '087 patent, discussed in detail above, uses a kind of unified memory in video systems and relates to different subject matter than the video compression/coding technology of the '663 patent. *See, e.g.*, CX-1644C (Richardson RWS) at Q&A 535-541.

Funai's RAND defense as to the '958 and '867 patents is largely premised upon a faulty comparison between LSI's [ ] proposal to Funai and the executed [ ] license agreements. The [ ] license agreements do not include televisions like those sold by Funai (or [ ], another LSI licensee), and the final negotiated terms of the [ ] licenses even differ from one another. *See* CX-1642C (Kerr RWS) at Q&A 117-130; CX-1599C (Waskiewicz WS) at Q&A 162-173; Carmichael Tr. 1446-1459. Further, even if a comparison to the [ ] licenses were proper, one would nevertheless find that an opening [ ] royalty rate of [ ] is an objectively reasonable opening proposal in view the [ ] royalty rates contained in the [ ]) license agreements, and because it was possible that through

[74] Respondents' expert did not perform a technical analysis. Leonard Tr. 1384-1385.

negotiations, a final [ ] royalty rate could have been obtained that would have been lower than [ ]. *See* Leonard Tr. 1358.

Funai's RAND defense does not even take into account LSI's negotiations and license agreement with [ ]. *See* Leonard Tr. 1392-1402. Yet, LSI's initial proposal to [ ] was during the same time period as the initial proposal LSI made to Funai [ ] Leonard Tr. 1393-1401; CX-0348C ([ ]) at 1-3; CX-0349C ([ ]) at 16; CX-1084C ([ ]) at 88; CDX-1213C (CX-1084C ([ ]) at 88; CX-0349C ([ ]) at 16). LSI's opening proposal to Funai and [ ] also included an [ ] royalty rate of [ ]. *See* CX-0349C ([ ]) at 16; CX-1084C ([ ]) at 88.

Importantly, Funai and [ ] sell DTVs that feature WLAN functionality. CX-1642C (Kerr RWS) at Q&A 55-56; CX-1634 ([ ] Television Products). Unlike Funai, [ ] negotiated a license to LSI's WLAN patent portfolio. CX-1599C (Waskiewicz WS) at Q&A 73-85; CX-1115C ([ ]) at 2, 19-21, 27-35. In contrast, neither the [ ] nor the [ ] licenses included DTVs as licensed products. CX-0035C ([ ] PLA) at 7; CX-0028C ([ ] PLA) at 6.

Additionally, after receiving the same initial offer that LSI provided to Funai, [ ] executed a license [ ]. *See* CX-1115C ([ ]) at 6. In this case, LSI [ ] the parties were never able to conclude an agreement. *See* CX-1599C (Waskiewicz WS) at Q&A 90-129; Waskiewicz Tr. 191-193; CX-1145C ([

]); CX-341C ([ ]) at 5, 7; CX-345C ([ ]) at 42; CX-0348C ([ ]); CX-0349C ([ ]); RX-978C ([ ]) at 42. Nevertheless, the [ ] of a potential license agreement, as seen in the [ ] agreement, is a term that could be raised by a potential licensee during licensing negotiations. CX-1115C ([ ]) at 6; Carmichael Tr. 1455.

Consequently, Funai has not adequately supported its RAND and equitable defenses.

With respect to Realtek, the evidence shows that [ ]

[ ] CX-1007C [ ]; *see* CX-1599C (Waskiewicz WS) at Q&A 179-182.

[ ] CX-1599C (Waskiewicz WS) at Q&A 183-185; CX-1077C [ ] CX-1599C (Waskiewicz WS) at Q&A 187-189; CX-0414C [ ] at 2. [ ] CX-1599C (Waskiewicz WS) at Q&A 193-194; CX-0415C [ ]. [ ] CX-1599C (Waskiewicz WS) at Q&A 196-199; [ ] Tr. 1278-1282; CX-1075C [ ].

[

] *See* CX-1599C (Waskiewicz WS) at Q&A 207-213; CX-1006C [ ]. [

] *See* Carmichael Tr. 1469-1470; CX-1006C [ ] at 2. [

] *See* CX-1599C (Waskiewicz WS) at Q&A 235-237; Waskiewicz Tr. 202-203; [ ] Tr. 1283-1284 [ ].

In addition to [ ] Realtek has not offered evidence showing which terms might constitute a RAND offer or license. *See* Carmichael Tr. 1425-1426. [

] *See* Carmichael Tr. 1431. [

] *See* Carmichael Tr. 1431-1432. Realtek also did not offer evidence that [

] *See* Carmichael Tr. 1433.

Focusing specifically on Realtek and its business, it is noted that [

] CX-1006C [

] at 9. Yet, a potential licensee, such as Realtek, could have raised the issue [

] *See* Carmichael Tr. 1456. Indeed, there is no evidence that LSI has ever refused to offer a license to the '958 and '867 patents [ ]. In fact, LSI has licensed the

'958 and '867 patents to [

]. CX-1599C (Waskiewicz WS) at Q&A 230-234; Waskiewicz Tr. 178; Carmichael Tr. 1463-1464.

Lack of evidence in important areas of Realtek's case, and [

] undercut its arguments that Complainants breached their RAND obligation under the theory of breach of contract/promissory estoppel.

After briefing was completed in this investigation, Judge Whyte in the United States District Court for the Northern District of California (San Jose Division) issued his "Order Granting Plaintiff Realtek Semiconductor Corporation's Motion for Partial Summary Judgment and Denying Defendants LSI Corporation and Agere Systems LLC's Motion to Stay." *Realtek Semiconductor Corp. v. LSI Corp. et al.*, No. C-12-03451-RMW, Order [Re Docket Nos. 67, 72] (N.D. Cal. May 20, 2013) ("Realtek District Court Order"). The court applied principles set forth in the *Microsoft* litigation (including the holdings of the District Court and the Ninth Circuit) relied on by Respondents in this investigation. *See* Realtek District Court Order at 7-11. The court held with respect to the '958 and '867 patents that "defendants breached their contractual obligations to IEEE and to Realtek as a third-party beneficiary of that contract by seeking injunctive relief against Realtek before offering Realtek a license. The court's breach of contract holding is limited to the situation here, where defendants did not even attempt to offer a license, on 'RAND' terms or otherwise, until after seeking injunctive relief." *Id.* at 11. The court enjoined defendants "from enforcing any exclusion order or injunctive relief by the ITC that they might obtain against Realtek with respect to the '958 and '867 declared essential patents." *Id.* at 14. In a footnote, the court continued, "This preliminary injunction will only go into effect in the event that the ITC grants an exclusion order or injunctive relief in favor of

defendants. The ITC may, of course, still analyze Realtek's claims and defenses independently, and may find no Section 337 violation in any event. In that instance, this preliminary injunction will become moot." *Id.* at 14 n.6.

Although the parties informed the administrative law judge of the issuance of the Realtek District Court Order, no motion seeking application of collateral estoppel was filed, nor did any party seek termination of the investigation as to Realtek on any other grounds. Indeed, the Realtek District Court Order contemplates the potential continuation of this investigation as to Realtek, as well as the Commission's independent analysis of the facts. Nevertheless, the question remains as to whether or not the administrative law judge should find that Complainants are barred from enforcing the '958 and '867 patents because Respondents are third-party beneficiaries of a contract whose terms Complainants have yet to satisfy. The administrative law judge has determined that such a finding should not be made for the following reasons.

First, it appears that the facts presented in this investigation are not identical to those presented to the District Court. As discussed above, an offer to license Realtek (and another offer to license Funai) was made by Complainants with respect to each of the asserted SEPs, albeit not necessarily an offer that in and of itself reflected the RAND terms one would find in a negotiated agreement. Furthermore, as also discussed above, the facts presented in this investigation show that the failure of the parties to agree to terms for the licensing of the asserted SEPs cannot be attributed to Complainants.

Second, there is no indication at this time that the Commission, as a matter of law, has determined to treat RAND obligations as contractual obligations, with respondents as third-party beneficiaries, that must be satisfied before relief may be sought at the Commission. Furthermore, the Commission has not determined whether it has the statutory authority to adopt

a policy of requiring patent holders to make an offer with RAND terms before filing a complaint at the Commission; nor has the Commission adopted such a policy. Indeed, "[t]he Commission and its ALJs have never adopted [respondent's] theory that a FRAND undertaking *per se* precludes a determination of violation." *Wireless Communications Devices*, Comm'n Op. at 46. The Commission also held, "At least one district court has analyzed a FRAND obligation under a contract theory. But to the extent [respondent] relies on a contract defense, [respondent] has not identified the basic elements necessary to prove a contract: the parties, the offer, the acceptance, the consideration, and definite terms." *Id.* at 48. Nor in this investigation have Respondents presented evidence to define such traditional elements of a contract defense, let alone one that is then extended to third-party beneficiaries.

Accordingly, in addition to finding that Complainants are not prevented from enforcing the '867, '958 and '663 patents due to a breach of RAND obligations or equitable estoppel, or due to any form of patent misuse that Respondents have alleged, the administrative law judge does not find that Complainants are prevented from enforcing the aforementioned patents due to contractual estoppel.[75]

B. Breach of Duty to Disclose SEPs to the IEEE

1. Summary of the Parties' Arguments

Aside from the question of whether or not the asserted patents are unenforceable due to the existence of and/or breach of RAND obligations, Respondents also argue that the '958 SEP patent (filed as U.S. Patent Application No. 09/064,188) and '867 SEP patent (filed as U.S. Patent Application No. 10/092,295, which is a continuation of U.S. Patent Application No.

[75] It is unclear whether Respondents assert an affirmative defense of contractual estoppel with respect to the '663 patent. *See* GR12 Filing. Nevertheless, the considerations discussed above apply to the '663 patent, as well as the to '958 and '867 patents.

08/155,661) are unenforceable because complainant Agere's predecessor, Lucent, and the inventors breached their duty to disclose the applications to the IEEE. Resps. Br. at 228-45; Resps. Reply at 86-88.

Respondents argue that, "A member of an open standard setting organization may be equitably estopped or may have impliedly waived its right to assert infringement claims against standard-compliant products." Resps Br. at 229 (citing *Hynix Semiconductor Inc. v. Rambus Inc.*, 645 F.3d 1336, 1347-48 (Fed. Cir. 2011)). It is argued that to support a finding of implied waiver in the standard setting organization context, the accused infringer must show that the patentee's "conduct was so inconsistent with an intent to enforce its rights as to induce a reasonable belief that such right has been relinquished." *Id.* (quoting *Qualcomm Inc. v. Broadcom Corp.*, 548 F.3d 1004, 1020 (Fed. Cir. 2008) (citation omitted)). Further, Respondents argue that equitable estoppel arises when "[t]he patentee, through misleading conduct, led the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer." *Id.* (quoting *Hynix*, 645 F.3d at 1348). It is also argued that "conduct" may include inaction or silence where there was an obligation to speak. *Id.* (citing *A.C. Aukerman Co. v. R.L. Chaides Const. Co.*, 960 F.2d 1020, 1028 (Fed. Cir. 1992)). Specifically, a patentee waives the right to claim infringement, and is estopped from doing so, when (1) the patentee had a duty of disclosure to the standard setting organization, and (2) the patentee breached that duty. *See Id.* (quoting *Hynix*, 645 F.3d at 1348).

With respect to the IEEE, Respondents argue that the SSO's patent policies from 1998 impose a duty to disclose "patent(s), including patent applications." Resps Br. at 230 (quoting RX-0039 (IEEE-SA Standards Board Bylaws (1998)) at LSIAgere837-00009449). Respondents show that the policies state that the IEEE may only include the "known use of patent(s),

including patent applications, if there is technical justification in the opinion of the standards-developing committee and provided the IEEE receives assurances from the patent holder that it will license applicants under reasonable terms and conditions." *Id.* It is pointed out, "[t]he IEEE encourages early disclosure to the working group of patent information that might be relevant to the standard," and requires members to submit letters of assurance "in the form of either a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement the proposed IEEE standard against any person or entity using the patent(s) to comply with the standard or b) A statement that a license will be made available to all applicants without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination." Resps. Br. at 230-31 (quoting (RX-2626 (IEEE-SA Standards Board Operations Manual (1998)) at LSIAgere837-00028032 and RX-0039 (IEEE-SA Standards Board Bylaws (1998)) at LSIAgere837-00009449). Respondents argue that this assurance shall be provided "prior to the approval of the standard." *Id.* at 231 (quoting RX-0039 (IEEE-SA Standards Board Bylaws (1998)) at LSIAgere837-00009449 and citing RX-2626 (IEEE-SA Standards Board Operations Manual (1998)) at LSIAgere837-00028032).

Relying on the opinion of the Federal Circuit in *Qualcomm*, 548 F.3d at 1013 (Fed. Cir. 2008), Respondents argue that the language of the IEEE patent policies plainly shows that the identification of patents, including patent applications, is critical to the development of a standard because the non-disclosure of patents or patent applications would make it impossible for the standards developing committee to determine if there is technical justification for using undisclosed patents or patent applications. It is argued that the non-disclosure of a participant's patents or patent applications could also put the participant in a position in which it could block

the use of a published standard by any company unless the company obtained a separate license from the participant. Paraphrasing the *Qualcomm* opinion, Respondents argue that thus "[t]he IEEE encourages early disclosure . . . of patent information that might be relevant to the standard." Resps. Br. at 231.

Respondents turn to the opinion of the Northern District of California in *Barnes & Noble, Inc. v. LSI Corp.*, 849 F. Supp. 2d 925, 937 (N.D. Cal. 2012), which held, "Such language implies that patent holders must disclose any patents that would be included in standards under consideration so that the IEEE can ensure compliance with its criteria." Resps. Br. at 232. Respondents argue that moreover, the Federal Circuit found similar policies encouraging disclosure as soon as possible to impose disclosure obligations on participants. *Id.* (citing *Qualcomm*, 548 F.3d at 1013-14 (concerning the Joint Video Team standard-setting organization). It is argued that the Federal Circuit rejected the argument that similar language merely encourages rather than requires the disclosure of patents because "this language applies to the timing of the disclosure (*i.e.*, 'encouraged to disclose as soon as possible'), not the disclosure duty itself." *Id.* (quoting 548 F.3d at 1014). Thus, Respondents argue, the Commission should find, as it was found in *Qualcomm*, that the policies impose a disclosure duty on participants. *Id.* at 232.

Respondents argue that IEEE participants also understood and treated the IEEE patent policies as imposing a disclosure duty, and indeed the IEEE took numerous steps to ensure that participants were aware of the policies, that the policies were followed, and that any intellectual property rights that might be relevant to a proposed standard were disclosed during the development of the standard. Resps. Br. at 232-34. Additionally, it is argued that the IEEE patent policies refer to patent information that "might be relevant" to a standard, and courts have

consistently held, such language requires that participants disclose patents or patent applications that "reasonably might be necessary" to practice the standard. *Id.* at 235 (citing RX-2626 (IEEE-SA Standards Board Operations Manual (1998)) at LSIAgere837-00028032; *Qualcomm*, 548 F.3d at 1017-18 (rejecting plaintiff's argument that such language requires that a patent "actually be necessary" in favor of a "reasonably might be necessary" standard); *Rambus Inc. v. Infineon Techs. AG*, 318 F.3d 1081, 1100 (Fed. Cir. 2003)).

Nevertheless, it is argued, in breach of their obligations, Lucent and the inventors waited three years to disclose the '188 and '661 patent applications, during which time Lucent participated heavily in the development of the 802.11 standard. Resps. Br. at 235-43. Respondents argue that Lucent assured participants that their proposal for the standard could be adopted with fear of patent holdup. Yet, it is argued, within one month of issuance of the '958 patent, Complainants [

] sued Intersil Corporation (formally Harris Semiconductor)—the very company it collaborated with during the standard-setting process—for infringement of the '958 patent based on the standard. *Id.* at 228, 241-42.

Respondents argue that breaches of the duty to disclose by Lucent and the inventors caused detrimental reliance. In particular, it is argued that by breaching its disclosure duty, Lucent intended to, and did, induce reliance by the IEEE, its members, and companies in the wireless networking industry who rely on 802.11 activities. Resps. Br. at 243 (citing, *inter alia*, *Barnes & Noble*, 849 F. Supp. 2d at 939-40, for the proposition that one may infer reliance). Further, it is argued that [

]

By way of example, it is argued, [

] *Id.* at 244 (citing RX-0011C [ ] at Q&A 25-38, Q&A 50-52; RX-0012C (Tsai WS) at Q&A 14-25, Q&A 30; RX-2272 (2003 Realtek Annual Report); RX-1327C (Realtek Patents and Patent Applications); RX-1328C (Realtek Sales Data)).

Complainants deny that the '958 and '867 patents are unenforceable due to an alleged failure to disclose them to the IEEE. Compls. Br. at 430-37. Complainants do not concede that at any time prior to the IEEE's approval of the 802.11b standard, IEEE members had a duty to disclose pending patent applications. *Id.* at 432-35. Rather, they argue, the written IEEE policies on which Realtek relies did not require disclosure of pending applications, but rather simply required that patent holders provide a letter of assurance that either (a) they would not enforce any present or future standard-essential patents, or (b) they would make a license available to all applicants without compensation or under reasonable and non-discriminatory rates, terms, and conditions. *Id.* at 432 (citing RX-0039 (IEEE Board Bylaws – 1998) at 14; RX-2626 (IEEE Operations Manual – 1998) at 25). They argue that while the written IEEE policies have language that IEEE "encourages" disclosure of patent information, the SSO policy language at issue in *Qualcomm* is easily distinguishable from the language of the IEEE policies at issue in this case. It is argued that in *Qualcomm*, the SSO had a defined written policy that required members to use "best efforts" to declare all relevant patents at the time a proposal was submitted, and required disclosure of all patents relevant to the standard before final approval of the standard. Yet, the IEEE policies only required that participants submit letters of assurance.

Moreover, it is argued, the court in *Qualcomm* emphasized that the SSO policy in question stated the goal of creating a royalty-free baseline for the standard, which was the critical factor in determining the importance of [the SSO's] members' obligation to disclose patents when making contributions. Yet, in this case, Complainants argue, the IEEE policies did not seek to create a royalty-free standard, but rather explicitly contemplated that standards may include the use of patented technology so long as the IEEE receives assurance from the patent holder that it will license applicants under reasonable terms and conditions for the purpose of implementing the standard. *Id.* at 432-33 (citing RX-0039 (IEEE Board Bylaws – 1998) at 14; RX-2626(IEEE Operations Manual – 1998) at 26).

Complainants also argue that it was not shown during the hearing that IEEE participants understood the IEEE to impose a duty to disclose pending applications because evidence that the written policies were mentioned at meetings does not show that participants had an understanding of the policies that was different from what is reflected in the written manuals. Compls. Br. at 433-34. Further, it is argued, Realtek has not provided testimony from any IEEE participant reflecting that participants viewed the IEEE policies as imposing a duty to disclose pending applications. In view of the above, Realtek has not demonstrated, much less demonstrated by clear and convincing evidence, that IEEE participants had a duty to disclose pending patent applications. *Id.* at 434.

In fact, Complainants argue, the '958 patent and '867 patents both issued several years after the adoption of the 802.11b standard, and the '867 patent was not even filed prior to adoption of the standard. Compls. Br. at 434 (citing RX-0019C (IEEE Std 802.11b-1999) at 1 (approved Sept. 1999); JX-0003 ('958 Patent) at 1 (issued Sept. 2002); JX-0005 ('867 patent) at 1 (issued Mar. 2004); JX-0005 ('867 patent) at 1 (filed Mar. 2002)). It is argued that inasmuch

as IEEE policies did not require disclosure of pending applications, individuals employed by Lucent could not have had a duty to disclose the '958 application or the '867 parent application. *Id.* at 435.

In any event, Complainants argue, the evidentiary record does not show that Lucent or any of its employees breached what duties did exist under IEEE's policies, because Lucent in fact submitted a letter of assurance with respect to the 802.11b standard. Compls. Br. at 435 (citing CX-1257C (Lucent-IEEE Letter, Apr. 29, 1998)). Complainants argue that such a letter is all that was required, and is comparable to other letters of assurance submitted to the IEEE during the 1997-1998 time period (including an earlier letter submitted by Lucent). *Id.* at 435-36 (citing RX-2214 (Hayes – IPR Letters Received for 802.11) at 6-7, 12, 15-16, 24 (letters of assurance from AT&T, Digital Ocean, Lucent, Norand, Novell, and Symbol)). Further, Complainants argue that Lucent also provided the IEEE with letters of assurance for the subsequent 802.11g and 802.11n standards, among others. *Id.* at 436 (citing CX-1261C (Agere-IEEE Letter, Jan. 24, 2003); CX-1263C (Agere-IEEE Task Group Letter, Jan. 24, 2003); CX-1271C (Agere-IEEE Letter, Feb. 13, 2007)). It is argued that Lucent's actions are in stark contrast to the facts in Qualcomm, which involved a knowing and intentional nondisclosure of patents to the SSO. *Id.*

Complainants argue that Realtek's equitable estoppel defense fails for additional reasons. It is argued that the evidentiary record does not show that Realtek relied on any conduct by Lucent or Complainants in connection with taking some action, or that Realtek will be prejudiced if Complainants are allowed to proceed with their claims. It is argued that any alleged silence by Lucent or its employees during the 802.11b standard setting process was not a communication to Realtek that could trigger estoppel, and in light of Lucent's April 1998 letter

of assurance, CX-1257C (Lucent-IEEE Letter, Apr. 29, 1998), which declared that Lucent would license any issued or pending standard-essential patents at a 5% royalty rate, neither the IEEE, its members, nor Realtek could have reasonably inferred that Lucent did not intend to enforce its patent rights. At most, it is argued, Realtek could have relied on Lucent's assurance to license on fair and reasonable terms, which Complainants have honored. Specifically with respect to prejudice, it is argued that Realtek has not provided any documents or other support [

] Accordingly, Complainants argue, Realtek has not demonstrated reliance or prejudice by clear and convincing evidence. Compls. Br. at 436-37 (citing, *inter alia*, RX-0011C (Chen WS) at Q&A 26-38).

2. Discussion and Ruling

In *Wireless Communications Devices*, the Commission was presented with an affirmative defense of unenforceability due to an alleged failure to disclose patents to an SSO (which in that case was ETSI, or the European Telecommunications Standards Institute). The Commission looked to *Qualcomm* (as have the parties in their briefing in this investigation) to hold that in order to establish such implied waiver, a respondent needed to establish four points: (1) that under the SSO policy the complainant had a duty as a participant to disclose patents on essential technology to the SSO; (2) that the asserted patents fell within the scope of that duty; (3) that the complainant had breached its disclosure duty by failing to disclose the asserted patents in a timely manner; and (4) that appropriate circumstances existed justifying a decision to hold the asserted patents unenforceable against products practicing the SSO's standard at issue. *Wireless Communications Devices*, Comm'n Op. at 65 (citing *Qualcomm*, 548 F.3d at 1012).

Complainant has made a strong case for differentiating the requirements of the IEEE from those applicable in *Qualcomm*.[76] Yet, as discussed below, Respondents' affirmative defense in this investigation fails for at least three independent reasons.

First, in *Wireless Communications Devices*, the Commission found that, even assuming the complainants had a duty to disclose the asserted patents under the *Qualcomm* standard, the respondent's equivocation concerning the question of whether or not the asserted patents were actually essential undercut its claim that the patents were essential and therefore triggered a duty to disclose. *Wireless Communications Devices*, Comm'n Op. at 65. In *Wireless Communications Devices*, the respondent specifically argued in one part of its petition for review that the complainant was wrong to declare the asserted patents essential, but in another part of its petition argued that the complainant failed to disclose them in a timely manner. *See id.* In this investigation, Respondents' arguments also equivocate on the question on essentiality. By the nature of their non-infringement arguments, which are discussed and in large part adopted by the administrative law judge above, Respondents call into question whether the asserted patents are actually essential to the relevant IEEE standards; yet, at the same time they argue that Lucent and the inventors breached a duty of disclosure to the IEEE.

Second, "patent holdup" is a key component of Respondents' arguments, as set forth in their briefing and as detailed above in the summary of the parties' arguments. In fact, Respondents argue that Lucent promoted the adoption of their proposal for the IEEE standard by assuring participants that there would be no holdup. *See* Resps. Br. at 231, 242. Such a concern was also important in *Wireless Communications Devices*, in which it was held that to the extent

[76] Complainants do not dispute Respondents' argument that a patent could be unenforceable based on misconduct relating to the underlying patent application.

timely disclosure was based on a concern about patent holdup from a company hiding intellectual property rights during the standard adoption process, the evidence showed that such a concern was not present in that case because the complainant had prospectively announced to the SSO that it would offer FRAND licenses to any of its patents that read on a standard adopted by the SSO. Indeed, it was noted that the complainant had already licensed its SEPs, including the asserted patents, to numerous companies. *See Wireless Communications Devices*, Comm'n Op. at 66. In this investigation, the evidence shows that Lucent (or Lucent's predecessor, Agere) in fact submitted a letter of assurance with respect to the 802.11b standard, as well as the subsequent 802.11g and 802.11n standards, among others. *See* CX-1257C (Lucent-IEEE Letter, Apr. 29, 1998); CX-1261C (Agere-IEEE Letter, Jan. 24, 2003); CX-1263C (Agere-IEEE Task Group Letter, Jan. 24, 2003); CX-1271C (Agere-IEEE Letter, Feb. 13, 2007). Additionally, Complainants have, in fact, conducted negotiations with, and have licensed, numerous companies under their patents, including the '958 and '867 patents. *See, e.g.*, CX-1599C (Waskiewicz WS) at Q&A 38-89; CX-1599C (Waskiewicz RWS) at Q&A 13-14, Q&A 56-61; CX-758C ([ ]) at 2; CX-36C ([ ] PLA) at 3, 4, 18; CX-37C ([ ] PLA Amendment) at 2; CX-762C ([ ]) at 22; CX-763C ([ ]) at 19; CX-27C ([ ] PLA) at 3-4, 13-15; CX-765C ([ ]) at 15-24; CX-766C ([ ]) at 4; CX-1557C ([ ]) at 80-119; CX-768C ([ ]) at 86-94, 103; CX-38C ([ ] PLA) at 14-17; CX-1115C ([ ]) at 2, 19-21, 27-35)).

Third, as detailed above, Respondents argue that breaches of the duty to disclose caused detrimental reliance by Realtek, [

] *See* Resps. Br. at 244 (and the exhibits cited therein). Yet, the evidence provided by Realtek, and cited in its brief, does not show that reliance was a factor [

] At most, it shows that [

] There is no contemporaneous evidence to show [ ] and it remains unclear whether any change in the assurances and declarations made by Lucent, Agere, or its employees would have caused Realtek to change the way that [ ] *See* [ ] Tr. 1268-1269. In any event, Realtek could have relied on Lucent's April 1998 letter of assurance [ ] and as discussed above with respect to Respondents' RAND defenses, could have continued to negotiate a license with Complainants for a license.

Consequently, it has not been proven that the '958 and '867 patents are unenforceable due to a breach of a duty to disclose their underlying applications to the IEEE.

C. Equitable Estoppel As to Realtek

1. Summary of the Parties' Arguments

In addition to the other estoppel defenses, Realtek argues that Complainants cannot assert the '958 and '867 patents against it due to an estoppel created when they abandoned prior infringement allegations, specifically [

] Resps. Br. at 245-54. It is argued that [

] It is also argued that [

] *Id.* at 245 (citing, *inter alia*, CX-1007C [ ]

Realtek argues that to assert its infringement claim broadly, [

] Indeed, it

is argued, while the application that resulted in the '867 patent [ ],

Complainants declared the patent standard-essential through its notice to the IEEE and its

allegation in this investigation. *Id.* at 245-46.

Realtek argues that [

] Resps. Br. at 246 (citing CX-1159C [

] and RX-1158C [ ]

Realtek argues that [

] Yet, Realtek argues, [

] *Id.* Realtek argues that in fact [

] Additionally, Realtek argues that [

] *Id.*

Realtek argues that three elements are required for equitable estoppel to bar a patentee's suit: (1) the patentee, through misleading conduct (or silence), leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer; (2) the alleged infringer relies on that conduct; and (3) the alleged infringer will be materially prejudiced if the patentee is allowed to proceed with its claim. Resps. Br. at 247 (citing *Radio Sys. Corp. v. Lalor*, No. 2012-1233, 2013 WL 811757, at *4 (Fed. Cir. Mar. 6, 2013) (which in turn cites *Aukerman*). It is further argued that misleading silence arises when "a patentee threatened immediate or vigorous enforcement of its patent right but then did nothing for an unreasonably long time." *Id.* (citing *Meyers v. Brooks Shoe, Inc.*, 912 F.2d 1459, 1464 (Fed. Cir. 1990)). It is argued that all three criteria exist here. *Id.* at 247-49. Further, Realtek argues that Complainants have been unable to excuse their long silence, even in its hearing testimony. *Id.* at 249-51. Moreover, it is argued, Realtek's reliance [

] thereby causing Realtek detrimental economic prejudice. *Id.* at 251-54.

Complainants deny that the '958 and '867 patents are unenforceable as to Realtek due to an alleged delay between notice of infringement and filing suit. Compls. Br. at 422-30. Complainants argue that [

] *Id.* at 422 (citing CX-1007C ([ ]) at 1; CX-1599C (Waskiewicz WS) at Q&A 174-179). It is argued that [

] *Id.* (citing CX-1007C [ ] at 1-2; CX-1599C (Waskiewicz WS) at Q&A 180). It is argued that [ ] CX-1077C [ ]. *Id.*

Complainants argue that [ ] Compls. Br. at 422 (citing CX-1077C [ ]; CX-1599C (Waskiewicz WS) at Q&A 182-185). It is argued that [ ] *Id.* (citing CX-0414C [ ] at 2-13; CX-1599C (Waskiewicz WS) at Q&A 186-191).

Complainants state that [ ] Compls. Br. at 423 (citing CX-0415C [ ]. It is argued that [ ] *Id.* (citing CX-1075C [ ]. However, it is argued, [ ]. *Id.* (citing Waskiewicz Tr.

185-186 ("[

]"); CX-1599C (Waskiewicz WS) at Q&A 198).

Complainants argue that [

].

It is argued that although Agere did not abandon its intent to license Realtek, it shifted its resources elsewhere in light of [ ] Further, Complainants argue, [

]. In fact, it is argued, Realtek [ ] prior to institution of this investigation in March 2012. Compls. Br. at 423-24 (citing CX-1645C (Waskiewicz RWS) at Q&A 9-55; [ ] Tr. 1263-1264, 1277-1278).

Complainants, turning to the Federal Circuit's opinion in *Forest Labs.*, argue that equitable estoppel may be imposed in a patent case when a patentee induces another party to believe that it will not sue that party for infringement. Like Respondents, they also turn to *Aukerman* to define the elements of equitable estoppel. They argue that the elements normally must be proven by a preponderance of the evidence. Compls. Br. at 424 (citing *Forest Labs., Inc. v. Abbott Labs.*, 339 F.3d 1324, 1329 (Fed. Cir. 2003); *Aukerman*, 960 F.2d at 1028)).

Complainants argue that no estoppel has been shown in this investigation because Realtek has not established any misleading conduct on the part of Complainants, and because the evidentiary record does not show that Agere engaged in any misleading conduct. Indeed, it is argued, where the allegedly misleading conduct is inaction, there must be other facts surrounding

the inaction that would lead the alleged infringer to infer that the patentee would not seek to enforce its rights. It is argued that silence alone will not give rise to estoppel unless there was a clear duty to speak or the silence somehow reinforced the inference that the patentee would not enforce its patent. Compls. Br. at 425 (citing *Aukerman*, 960 F.2d at 1028, 1042-44). Complainants argue that silence will typically give rise to estoppel only in cases where a patentee "threatened immediate or vigorous enforcement" of its patent and "then did nothing for an unreasonably long time." *Id.* (quoting *Meyers v. Asics Corp.*, 974 F.2d 1304, 1309 (Fed. Cir. 1992)). Indeed, Complainants argue, a suggestion of infringement coupled with an offer to license that is followed by silence will not establish equitable estoppel. *Id.* (citing *Hemstreet v. Computer Entry Sys. Corp.*, 972 F.2d 1290, 1294 n.5 (Fed. Cir. 1992); *Meyers*, 974 F.2d at 1308 (attempts to negotiate licenses followed by period of silence "does not, in itself, constitute the necessary misleading conduct"); *Teradyne, Inc. v. Hewlett-Packard Co.*, No. C-91-0344 MHP, 1994 WL 327213, at *4 to *7 (N.D. Cal. June 24, 1994) (no equitable estoppel based on letter offering to license patents followed by eleven-year period of silence prior to filing suit)).

Furthermore, Complainants argue, it was Realtek, not Agere, that went silent after a series of communications [

]

Indeed, it is argued, Realtek was aware that Complainants were involved in multiple litigations during the period between when [ ] and when this investigation was filed in 2012. Compls. Br. at 426-27 (citing CX-1645C (Waskiewicz RWS) at Q&A 49-55 (describing litigations); CX-0076 (Realtek Answer, 11cv0179) at 19-21 (2011 pleading showing Realtek's knowledge of Broadcom and Intersil litigations)). In such

circumstances, it is argued, an alleged infringer's knowledge of the patentee's litigation against others weighs against finding that the alleged infringer reasonably drew an inference it would not be sued. *Id.* at 427 (citing *Aukerman*, 960 F.2d at 1044).

Complainants argue that in any event, the evidentiary record does not establish that Realtek relied on any conduct by Agere in connection with taking some action. They argue that Realtek's witness [ ] gave conclusory testimony that [ ]; but [ ] statements are not backed up by any supporting exhibits or other corroboration. Compls. Br. at 428 (citing RX-0011C (Chen WS) at Q&A 44-45). Further, it is argued, [ ] *Id.* at 428 (citing [ ] Tr. 1261-1262 [ ], 1290 [ ], 1268-1269 ( ]). Moreover, Complainants argue, [ ] testified that [ ] *Id.* at 428-29 (citing [ ] Tr. 1263-1264, 1267-1268, 1283, 1287 ([ ]). Complainants argue that as in *Meyers*, the evidence here "suggests that [Realtek] ignored or gave little weight to [Agere's] efforts to negotiate licenses." *Id.* at 429 (citing 974 F.2d at 1309). Thus, it is argued, Realtek

has not demonstrated by a preponderance of the evidence any reliance on Complainants' conduct. *Id.*

Finally, Complainants argue, Realtek has not established any prejudice if Complainants are allowed to proceed with their infringement claims. It is argued that [ ] testimony provides a discussion of [ ] and then avers that [ ] but does not provide any documents or other support for his assertions that [ ] Compls. Br. at 429 (citing RX-0011C ([ ]) at Q&A 26-38). Such documentation, Complainants argue, could have easily been provided in the form of a more recent Annual Report; [ ] conclusory statements are insufficient to establish economic prejudice. Moreover, it is argued, as discussed above, [ ] clearly testified that [ ] *Id.* at 429-30.

2. Discussion and Ruling

In applying the standards set forth in *Aukerman*, the administrative law judge has determined that Realtek has not established the required elements of equitable estoppel. Many of the facts, and even much of the relevant law, have already been discussed above in connection with other unenforceability defenses. Yet, a further discussion of the evidence and law focuses more particularly on the defense that concerns the communications, or lack thereof, between Agere and Realtek.

The evidence shows that [

] CX-1007C ([ ]). [ ] *Id.* The letter was neither a mere invitation, as it is characterized by Complainants, nor was it a letter fraught with demands, as it has been characterized by Respondents. In any event, [ ].

The cases cited by the parties show that a suggestion of infringement coupled with an offer to license does not constitute a threat of immediate and vigorous enforcement of one's patents, and will not necessarily establish equitable estoppel even if followed by a period of silence. *See Hemstreet*, 972 F.2d at 1294 n.5; *Meyers*, 974 F.2d at 1308; *Teradyne*, No. C-91-0344 MHP, 1994 WL 327213, at *4 to *7; *ABB Robotics, Inc. v. GMFanuc Robotics Corp.*, 828 F. Supp. 1386, 1388, 1397-98 (E.D. Wis. 1993), *aff'd*, 52 F.3d 1062, 1063-64 (Fed. Cir. 1995). Where it is the alleged infringer, not the patentee, that goes silent following a series of communications, there is no "inaction" or "misleading silence" attributable to the patentee. *Hemstreet*, 972 F.2d at 1295 (where onus was on alleged infringer to respond to patentee's last communication, no misleading conduct by patentee).

In this case, [ ]. Waskiewicz Tr. 185-186; CX-1075 ([

)]. While [

] Realtek easily could have responded [ ] to pursue that request. [ ].

Realtek asserts that the length of time between [ ] and the complaint in this investigation supports an inference that Agere abandoned its claims. Yet, Realtek was aware of Complainants' other litigations involving the asserted patents during this time period. *See* CX-1645C (Waskiewicz RWS) at Q&A 49-55; CX-0076 (Realtek Answer, 11cv0179) at 19-21; *see also Aukerman*, 960 F.2d at 1044 (alleged infringer's knowledge of patentee's litigation against others weighs against finding reasonable inference that patentee would not enforce its patents).

In addition, as Realtek's witness testified at the hearing, [

]

Tr. 1268-1269. In contrast, there is no contemporaneous evidence to support Realtek's position.[77] The evidence does not support Realtek's argument that it relied on silence between Agere and Realtek to [ ].

Nor has Realtek supported its contention that [

[77] *Compare Hall v. Aqua Queen Mfg., Inc.*, 93 F.3d 1548, 1558 (Fed. Cir. 1996) (court persuaded by argument that alleged infringer submitted only "*post hoc* conclusory statements that it relied on [the patentee's] conduct rather than any undisputed contemporaneous evidence demonstrating such reliance"), *with Wafer Shave, Inc. v. Gillette Co.*, 857 F. Supp. 112, 122 (D. Mass. 1993) (alleged infringer presented internal documents corroborating assertion that it had relied on patentee's delay).

]. In fact, the hearing testimony shows that [

].

Q. [

A.

]

[ ] Tr. 1287.

Any losses Realtek may incur if the Commission were to find a violation of section 337 would be a result of ongoing infringement rather than any prejudice caused by Complainants or their predecessor.

Accordingly, it is not found Complainants are estopped from asserting the '958 and '867 patents against Realtek.

XI. Conclusions of Law

1. The Commission has subject matter, personal, and *in rem* jurisdiction in this investigation.

2. The importation requirement is satisfied as to the Funai and Realtek accused products.

3. Funai's accused products directly infringe asserted claims 1, 5, 7-9, and 16 of U.S. Patent No. 5,870,087. Funai is liable for induced infringement of asserted claims 10 and 11 of the '087 patent.

4. Funai's accused products do not infringe asserted claims 1-9 and 11 of U.S. Patent No. 6,982,663; asserted claims 22-26, 29, 32, and 35 of U.S. Patent No. 6,452,958; or asserted claims 20, 23, 24, 26-35, 37-40, 47, 49-56, and 58-61 of U.S. Patent No. 6,707,867.

5. Realtek's accused products do not infringe asserted claims 22-26, 29, 32, and 35 of the '958 patent; or asserted claims 20, 23, 24, 26-35, 37-40, 47, 49-56, and 58-61 of the '867 patent.

6. It has not been shown by clear and convincing evidence that any asserted claim of the '087, '663, '958, or '867 patent is invalid.

7. The domestic industry requirement is satisfied as to all asserted patents.

8. Respondents have not prevailed on any equitable or RAND defense.

XII. Initial Determination on Violation

Accordingly, it is the Initial Determination of the undersigned that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain audiovisual components and products containing the same, with respect to asserted claims 1, 5, 7, 8, 9, 10, 11, and 16 of U.S. Patent No. 5,870,087. It is also the Initial Determination of the undersigned that a violation of section 337 of the Tariff Act, as amended, has not occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain audiovisual components and products containing the same, with respect to asserted claims 1, 2, 3, 4, 5, 6, 7, 8, 9, and 11 of U.S. Patent No. 6,982,663; asserted claims 22, 23, 24, 25, 26, 29, 32, and 35 of U.S. Patent No. 6,452,958; or asserted claims 20, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 47, 49, 50, 51, 52, 53, 54, 55, 56, 58, 59, 60, and 61 of U.S. Patent No. 6,707,867.

Further, this Initial Determination, together with the record of the hearing in this investigation consisting of (1) the transcript of the hearing, with appropriate corrections as may

hereafter be ordered, and (2) the exhibits received into evidence in this investigation, is hereby certified to the Commission.

In accordance with 19 C.F.R. § 210.93(c), all material found to be confidential by the undersigned under 19 C.F.R. § 210.5 is to be given *in camera* treatment.

The Secretary shall serve a public version of this ID upon all parties of record and the confidential version upon counsel who are signatories to the Protective Order, as amended, issued in this investigation.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review pursuant to § 210.43(a) or the Commission, pursuant to § 210.44, orders on its own motion a review of the ID or certain issues herein.

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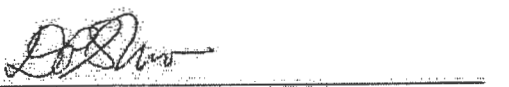
XIII. Order

To expedite service of the public version, each party is hereby ordered to file with the Commission Secretary no later than July 26, 2013, a copy of this Initial Determination with brackets to show any portion considered by the party (or its suppliers of information) to be confidential, accompanied by a list indicating each page on which such a bracket is to be found.[78] At least one copy of such a filing shall be served upon the office of the undersigned, and the brackets shall be marked in red. If a party (and its suppliers of information) considers nothing in the Initial Determination to be confidential, and thus makes no request that any portion be redacted from the public version, then a statement to that effect shall be filed.



David P. Shaw
Administrative Law Judge

Issued: July 18, 2013

[78] Confidential business information ("CBI") is defined in accordance with 19 C.F.R. § 201.6(a) and § 210.5(a). When bracketing portions of this Initial Determination to indicate CBI, a high level of care must be exercised in order to ensure that non-CBI portions are not indicated. Other than in extremely rare circumstances, block-bracketing is prohibited. In most cases, bracketing of only discrete CBI words and phrases will be permitted.

CERTAIN AUDIOVISUAL COMPONENTS AND PRODUCTS CONTAINING THE SAME

Inv. No. 337-TA-837

PUBLIC CERTIFICATE OF SERVICE

I, Lisa R. Barton, hereby certify that the attached **INITIAL DETERMINATION** was served upon the following parties as indicated, on AUG 14 2013.

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

FOR COMPLAINANTS LSI CORP.; AND AGERE SYSTEMS LLC:	
David F. Nickel, Esq. **FOSTER, MURPHY, ALTMAN & NICKEL, PC** 1899 L Street, NW, Suite 1150 Washington, DC 20036	( ) Via Hand Delivery (✓) Express Delivery ( ) Via First Class Mail ( ) Other: _____
FOR RESPONDENTS FUNAI ELECTRIC CO., LTD.; FUNAI CORP. INC.; P&F USA, INC.; AND FUNAI SERVICE CORP.:	
Paul Devinsky, Esq. **MCDERMOTT WILL & EMERY LLP** 500 North Capitol Street, NW Washington, DC 20001	( ) Via Hand Delivery (✓) Express Delivery ( ) Via First Class Mail ( ) Other: _____

FOR RESPONDENT REALTEK SEMICONDUCTOR CORP.:	
Elizabeth A. Niemeyer, Esq. **FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP** 901 New York Avenue, NW Washington, DC 20001	( ) Via Hand Delivery (✓) Express Delivery ( ) Via First Class Mail ( ) Other: _____

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