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

GENERAL VIDEO, LLC, v. LENOVO GROUP LIMITED.	Civil Action No. 5:24-cv-00122-RWS Lead Case
GENERAL VIDEO, LLC, v. HP INC.	Civil Action No. 5:24-cv-00123-RWS
GENERAL VIDEO, LLC, v. ACER INC.	Civil Action No. 5:24-cv-00125-RWS
GENERAL VIDEO, LLC, v. ASUSTEK COMPUTER INC., ET AL	Civil Action No. 5:24-cv-00126-RWS

DEFENDANT HP INC.'S INVALIDITY CONTENTIONS

Pursuant to the Eastern District of Texas Local Patent Rule 3-3 and the Court's Docket Control Order (D.I. 56), Defendant HP Inc. ("HP" or "Defendant") provides these Invalidity Contentions to Plaintiff General Video, LLC ("General Video" or "Plaintiff") for the claims asserted in Plaintiffs' April 28, 2025, Disclosure of Asserted Claims and Infringement Contentions ("Infringement Contentions").

HP's Invalidity Contentions include accompanying claim charts concerning U.S. Patent No. 6,584,443 (the "'443 Patent"); U.S. Patent No. 7,069,224 (the "'224 Patent"); U.S. Patent No. 7,225,282 (the "'282 Patent"), U.S. Patent No. 7,359,437 (the "'437 Patent"); U.S. Patent No. 9,036,010 (the "'010 Patent"), and U.S. Patent No. 9,843,786 (the "'786 Patent") (collectively, the "Asserted Patents").

I. INTRODUCTION

Plaintiff asserts that HP infringes the following patents and claims: claims 7 and 9 of the '443 Patent, claims 3 and 5 of the '224 Patent, claim 1 of the '282 Patent, claim 41 of the '437 Patent, claims 1 and 12 of the '010 Patent, and claims 1 and 13 of the '786 Patent (collectively, "Asserted Claims"). As further detailed in and supported by these Invalidity Contentions, HP contends that each of the Asserted Claims is invalid under at least 35 U.S.C. §§ 101, 102, 103, and/or 112.[1]

Based on this disclosure of the Asserted Claims, HP does not provide any contentions regarding any claims not asserted in Plaintiff's Infringement Contentions. To the extent that the Court permits Plaintiff to assert additional claims against HP and/or to amend its infringement contentions, HP reserves the right to further modify, amend, or supplement these invalidity

[1] References to Title 35 of the United States Code are to statutes prior to amendment under the America Invents Act ("AIA"), to the extent that the Asserted Patents have effective filing dates prior to applicable AIA effective dates. As explained herein, however, Defendant disputes General Video's asserted priority dates for the Asserted Claims of the Asserted Patents.

contentions accordingly—for example, to show the patent invalidity and/or ineligibility of any such newly Asserted Claims.

These Invalidity Contentions do not constitute an admission that any accused products infringe the Asserted Patents. In other words, these Invalidity Contentions should not be deemed to be related to the non-infringement positions that HP may advance in this action. In particular, HP's Invalidity Contentions are made in addition to, and/or in the alternative to, HP's non-infringement positions, and should not be interpreted to rely upon, or in any way affect, the non-infringement arguments HP makes in this case.

HP further reserves the right to amend or supplement these Invalidity Contentions in view of the Court's construction of terms and phrases recited in one or more of the Asserted Claims, additional information obtained during discovery (including any additional prior art references HP identifies), additional infringement theories put forth by Plaintiff during fact and/or expert discovery (to the extent permitted by the Court), any findings as to the priority dates of the Asserted Claims, and/or positions that Plaintiff, its fact witnesses, or its expert witnesses may take concerning claim construction, infringement, and/or invalidity issues, as permitted by the Court. HP further reserves the right to supplement its accompanying document productions should it later discover additional prior art documents, information, testimony, systems and related documentation, and/or software or hardware code, including information provided by third parties after the date of service of these Invalidity Contentions.

Prior art not included in these Invalidity Contentions, whether known or not known to HP, may become relevant. Indeed, because discovery is ongoing, HP anticipates that additional prior art and invalidity bases may be found. As one example, HP is currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the Asserted Claims are not disclosed in the

prior art identified in these Invalidity Contentions. Accordingly, HP reserves the right to identify other references that disclose the allegedly missing limitations of the claims of the Asserted Patents, to the extent Plaintiff identifies any such allegedly missing limitations. Additionally, HP's investigation and analysis of the prior art is continuing, and thus HP reserves the right to supplement, amend, and/or revise the information provided herein as HP conducts further investigation and/or analysis, including identifying, charting, and relying on additional references. As an example, Plaintiff may disclose additional prior art, and that prior art may support additional invalidity positions. As another example, in view of on-going and likely additional third-party discovery by Plaintiff and HP to third parties believed to have knowledge, documents, and/or other evidence concerning invalidity of one or more of the Asserted Claims, HP reserves the right to present additional items of prior art under 35 U.S.C. §§ 102(a), (b), (e), and/or (g) and/or § 103 identified in view of third-party discovery or further investigation, and to assert contentions of invalidity under 35 U.S.C. §§ 102(c), (d), or (f) based on such information.

HP may further rely on inventor admissions concerning the scope or state of the prior art relevant to the Asserted Claims, the patent prosecution histories of the Asserted Patents or related patents and/or patent applications (including the prior art cited therein), any deposition or trial testimony (*e.g.*, testimony from the named inventors on the Asserted Patents), and the papers filed and any evidence produced or submitted and admissions by Plaintiffs in connection with these cases or other related litigation. HP reserves the right to contend that one or more of the Asserted Claims are invalid under 35 U.S.C. § 102(f) in the event HP obtains evidence that one or more of the named inventors did not invent the subject matter in the Asserted Claims.

Further, consistent with the Court's Docket Control Order (D.I. 56), HP provides these Invalidity Contentions before the parties have begun the claim construction process. The citation

and discussion of prior art herein and in the accompanying exhibits are not intended to reflect HP's claim construction positions, which will be disclosed in due course in accordance with the Docket Control Order (D.I. 56). Instead, in many instances, HP's contentions, as stated, may reflect or imply a certain claim scope or claim interpretation, which is set forth in view of positions or interpretations suggested or implied by Plaintiff's submissions to date, and in many other instances, HP's contentions may suggest different alternative claim interpretations. To the extent these contentions state, reflect, or suggest a particular interpretation or reading of any claim element, HP does not adopt, advocate, or acquiesce to such an interpretation or reading. HP's contentions therefore should not be relied upon as a statement of HP's claim interpretations and should not be relied upon as any admission regarding the proper scope of the claims. In fact, HP disputes many of Plaintiff's apparent constructions. HP's claim construction positions will be provided at a later and appropriate time in this case, as noted above. Nor do these Invalidity Contentions constitute any admission by HP that any accused products, including any current or past versions of those products or services, are covered by any Asserted Claim. HP does not take any position herein regarding the proper scope or construction of the Asserted Claims.

Additionally, Plaintiff has not identified its contentions regarding the level of ordinary skill in the art for a personal of ordinary skill in the art ("POSITA") for any of the Asserted Patents. Thus, HP has based its Invalidity Contentions on the level of skill in the art apparent from the face of the asserted patents. For the avoidance of doubt, HP contends that the Asserted Claims are invalid for the reasons set forth in its Invalidity Contentions under any plausible definition of the level of ordinary skill for each of the Asserted Patents. Nevertheless, HP reserves the right to amend or supplement these Invalidity Contentions in response to any position taken by Plaintiffs as to the level of ordinary skill in the art applicable to a given Asserted Patent.

The references identified in these Invalidity Contentions, which include the attached claim charts, disclose the elements of the Asserted Claims explicitly and/or inherently, render those elements alone or in combination obvious to those of ordinary skill, and show the state of the art in the relevant time frame. References identified in these Invalidity Contentions, as well as the "References Cited" on the face of the Asserted Patents and the patents cited within the body of the Asserted Patents, may be used to illustrate, but not limit the scope of, the state of the art to which the Asserted Patents pertain (i.e., at a time prior to the date of alleged inventions of the Asserted Claims of the Asserted Patents). Moreover, HP reserves the ability to rely on later-identified sources of information, including but not limited to witness testimony and other discovery, to establish the state of the art in the relevant time frame pertaining to the Asserted Patents.

In addition to the positions and prior art identified in these Invalidity Contentions (including the accompanying claim charts), HP also incorporates by reference all invalidity contentions and subject matter eligibility contentions, prior art, and invalidity claim charts (including, without limitation, all anticipation positions, obviousness positions, indefiniteness positions, written description positions, and non-enablement positions) concerning one or more of the Asserted Patents, that are disclosed at any time. This includes without limitation, the invalidity contentions and disclosures served by any defendant in this consolidated action, in any previous or related litigation, in United States Patent & Trademark Office ("USPTO") proceedings or any other proceedings involving the Asserted Patents and other patents related to the Asserted Patents, by the Plaintiff, by any other parties, whether or not accused of patent infringement by the Plaintiff, or by the named inventors or any individuals associated with the prosecution and/or any form of post-grant review or reexamination of the Asserted Patents. For example, HP identifies, as prior art upon which it may rely to show the invalidity of the Asserted Claims, the prior art references

disclosed by parties in any other litigation or proceedings (including *inter partes* review and/or reexamination proceedings) involving one or more of the Asserted Patents, any patent related to any of the Asserted Patents, and/or any other patent claiming priority to the Asserted Patents.

To the extent HP has stipulated or stipulates in the future that it will not pursue certain invalidity grounds in these actions concerning patent claims subject to instituted *inter partes* review proceedings, HP will abide by those stipulations, and nothing in these contentions should be read as suggesting otherwise. Rather, these contentions are intended to put Plaintiff on notice of the grounds of invalidity that HP may assert in this action, including because the conditions of any relevant stipulation are not met (*e.g.*, if the corresponding *inter partes* review is not instituted) or because the grounds fall outside the scope of such stipulations.

II. PLAINTIFF'S INFRINGEMENT CONTENTIONS

Plaintiff's Infringement Contentions are clearly deficient. For example, as explained during the parties' June 12, 2025, meet and confer, and further in HP's Objections and Responses to Plaintiff's First Set of Common Interrogatories, Plaintiff's Infringement Contentions are deficient.

First, Plaintiff's Infringement Contentions allege that "the invention of each Asserted Claim is essential to, and must be used to perform, comply with, and implement the Infringing DP Standards." Infringement Contentions at 4. Plaintiff identifies fifteen (15) DP Standards in its Infringement Contentions but does not include an infringement analysis for each of the DP Standards. Furthermore, Plaintiff fails to establish that the DP Standards charted in Appendices B-K (*e.g.*, DP 1.2 and eDP 1.3, "Charted Versions") are representative of the other DP Standards listed in Plaintiff's Disclosure of Asserted Claims and Infringement Contentions ("Cover Pleading") but not charted in the appendices ("Uncharted Versions"). *See Universal Connectivity Technologies Inc. v. Lenovo Group Limited*, 2025 WL 1144734, at *3 (E.D. Tex. Apr. 15, 2025) ("*UCT*") ("Plaintiff's broad identification of multiple versions of an industry standard, without

more, is also problematic. An accused product may support or comply with one version of a standard but not support or comply with another version of the same standard. One version of a standard may infringe an asserted patent, while a different version may not. . .. Further, Plaintiff does not demonstrate how the uncharted versions of the accused standards contain the same information as the charted versions of the accused standards.").

Second, Plaintiff's Infringement Contentions are insufficient because they do not "demonstrate how each accused product," including components therein, "conforms to each accused standard." *Id.* at *3-4; *see id.* at *2 ("If the asserted patents are necessary or essential to certain accused standards, Plaintiff must . . . show how each accused product, or representative product, conforms to that standard."). In the Infringement Contentions, Plaintiff asserts that Appendices B-K are charts showing "how each element of each Asserted Claim is found in . . . one or more of the Infringing DP Standards, as performed, complied with, and implemented by the Accused HP Products." Infringement Contentions at 3. However, Plaintiff fails to identify any specific, let alone representative, HP product or component in the appendices, thereby failing to put HP on notice as to how its products meet each of the Asserted Claims.

Third, Plaintiff's Infringement Contentions are insufficient because, while Plaintiff contends that the Asserted Patents are standard essential (*see* Infringement Contentions at 4), Plaintiff's Infringement Contentions failed to provide any support, let alone, adequate support to demonstrate that the Asserted Patent, and or the cited portions of the accused standard, is in fact standard essential. Plaintiff's Infringement Contentions failed to show that each limitation of at least one Asserted Claim for each of the Asserted Patents reads onto a mandatory portion of the accused standard. Plaintiff also fails to identify any specific, let alone representative, HP product or component in the appendices, thereby failing to put HP on notice as to how its products meet at

least one Asserted Claim from each Asserted Patent that Plaintiff contends is mandatory to the accused standard.

Simply put, Plaintiff's Infringement Contentions do not satisfy Plaintiff's burden of providing Defendant with "reasonable notice . . . of the accused products," *UCT*, at *1 (quoting *Revolaze LLC v. J.C. Penney Corp. Inc.*, 2020 WL 2220125, at *3 (E.D. Tex.)).

Finally, Plaintiff has presented insufficient contentions for indirect infringement, *i.e.*, active inducement or contributory infringement. Plaintiff has not, for example, provided contentions that sufficiently identify how HP allegedly induces direct infringement of the Asserted Patents by a third party, or how HP allegedly contributes to the infringement of the Asserted Patents by a third party. Plaintiff has also not provided contentions that sufficiently allege HP's pre-suit knowledge of the Asserted Patents. Nor has Plaintiff provided sufficient contentions regarding any alleged infringement by multiple parties pursuant to 35 U.S.C. § 271(a) (*i.e.*, joint infringement). Nor has Plaintiff provided sufficient contentions of any alleged infringement under the doctrine of equivalents. Rather, regarding the doctrine of equivalents, Plaintiff stated "these Contentions are for literal infringement (not infringement under the doctrine of equivalents)." (Infringement Contentions at 3-4.) Plaintiff has therefore waived any such claims.

HP reserves the right to modify or add additional contentions in light of Plaintiff's failure to provide adequate infringement contentions. HP specifically reserves the right to modify, amend, or supplement its contentions as Plaintiff modifies, amends, or supplements its disclosures and/or produces documents in discovery.

Additionally, Plaintiff has presented insufficient contentions for indirect infringement, *i.e.*, active inducement or contributory infringement. Plaintiff has not, for example, provided contentions that sufficiently identify how HP allegedly induces direct infringement of the Asserted

Patents by a third party, or how HP allegedly contributes to the infringement of the Asserted Patents by a third party. Plaintiff has also not provided contentions that sufficiently allege HP's pre-suit knowledge of the Asserted Patents. Nor has Plaintiff provided sufficient contentions regarding any alleged infringement by multiple parties pursuant to 35 U.S.C. § 271(a) (*i.e.*, joint infringement). Nor has Plaintiff provided sufficient contentions of any alleged infringement under the doctrine of equivalents. Plaintiff has therefore waived any such claims.

HP provides these disclosures consistent with the schedule currently in place but does so without waiving any right to receive from Plaintiff full and complete infringement disclosures as Plaintiff is required to provide with Plaintiff's Infringement Contentions. HP's compliance with the current schedule should not be viewed as a waiver of any right to seek relief regarding the deficiencies in Plaintiff's Infringement Contentions or to further amend or supplement its Invalidity Contentions once Plaintiff complies with the Court's requirements.

III. PLAINTIFF'S ALLEGED PRIORITY DATES

The Invalidity Contentions are based on the priority dates set forth in the Infringement Contentions. However, as explained further below, one or more of the Asserted Patents are not entitled to the priority dates set forth in the Infringement Contentions. HP reserves the right to amend these Invalidity Contentions upon Plaintiff's assertion of any other priority dates or the Court's (or other competent jurisdiction's) determination of the correct priority dates of the Asserted Claims. For example, HP reserves the right to use related patents in the alleged chain of priority of the Asserted Patents as prior art upon the Court's determination of the priority dates of the Asserted Claims. As another example, if the Asserted Patents are not entitled to the priority claims made, then HP asserts that some or all of the functionalities contained, referenced, or otherwise included in the accused products (or any predecessor) may serve as prior art to the extent that they predate the filing date of the Asserted Patents.

A. ’437 Patent

In its Infringement Contentions, Plaintiff contends that the Asserted Claim of the ’437 Patent is entitled to a priority date of September 12, 2001, the filing date of U.S. Application No. 09/954,663. *See* Infringement Contentions, 2.

The ’437 Patent was filed on December 24, 2001, and is a continuation-in-part of Appl. No. 09/954,663, filed on September 12, 2001. Accordingly, there is no presumption that the Asserted Claim of the ’437 Patent is entitled to its earliest claimed priority date, and Plaintiff bears the burden of proving a priority date earlier than the December 24, 2001 filing date of the ’437 Patent. *See, e.g.*, *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1305 (Fed. Cir. 2008).

Plaintiff has not met its burden to demonstrate that the Asserted Claim of the ’437 Patent should be entitled to an earlier priority date—or even attempted to do so—at least because Plaintiff has provided no claim analysis and has not identified any supporting disclosures for the Asserted Claim of the ’437 Patent in the claimed September 12, 2001, priority application.

The Asserted Claim of the ’437 Patent is not entitled to a priority date earlier than December 24, 2001, because Appl. No. 09/954,663 does not set forth an adequate written description or enable the claim scope for at least the following claim limitations:

> “generating bursts of encoded control words by encoding control bits” (claim 41);
>
> “transmitting over the link a first burst of the encoded control words between a first burst of the video code words and the burst of the selected code words, and a second burst of the encoded control words between the burst of the selected code words and a second burst of the video code words.” (claim 41).

B. ’443 Patent

In its Infringement Contentions, General Video contends that the Asserted Claims of the ’443 Patent are entitled to a priority date of April 23, 1999, the filing date of JP11-115885. *See* Infringement Contentions, 2.

General Video bears the burden of proving—for each and every Asserted Claim of the ’443 Patent—a priority date earlier than the April 20, 2000, filing date of the ’443 Patent. *See, e.g.*, *PowerOasis*, 522 F.3d at 1305.

General Video has not met its burden to demonstrate that the Asserted Claims of the ’443 Patent should be entitled to an earlier priority date—or even attempted to do so—at least because General Video has provided no analysis on a claim-by-claim basis and has not identified any supporting disclosures for any Asserted Claim of the ’443 Patent in the claimed April 23, 1999, priority application.

None of the Asserted Claims of the ’443 Patent is entitled to a priority date earlier than April 20, 2000, because JP11-115885 does not set forth an adequate written description or enable the claim scope for at least the following claim limitations:

- “wherein the audio-related information includes monitor information indicating whether or not the audio data is capable of being monitored in the reception step.”

C. ’224 Patent

In its Infringement Contentions, General Video contends that the Asserted Claims of the ’224 Patent are entitled to a priority date of April 23, 1999, the filing date of JP11-115885. *See* Infringement Contentions, 2.

General Video bears the burden of proving—for each and every Asserted Claim of the ’224 Patent—a priority date earlier than the April 28, 2003, filing date of the ’224 Patent. *See, e.g.*, *PowerOasis*, 522 F.3d at 1305.

General Video has not met its burden to demonstrate that the Asserted Claims of the ’224 Patent should be entitled to an earlier priority date—or even attempted to do so—at least because General Video has provided no analysis on a claim-by-claim basis and has not identified any

supporting disclosures for any Asserted Claim of the ’224 Patent in the claimed April 23, 1999, priority application.

None of the Asserted Claims of the ’224 Patent is entitled to a priority date earlier than April 20, 2000, because JP11-115885 does not set forth an adequate written description or enable the claim scope for at least the following claim limitations:

- “an analysis section operable to determine whether or not the audio data is capable of being monitored by the receiver”;
- “wherein the audio-related information includes monitor information indicating whether or not the audio data is capable of being monitored by the receiver”; and
- “the analysis section determines whether or not the audio data is capable of being monitored by the receiver based on the monitor information.”

IV. INVENTORSHIP

Consistent with the reservation of rights previously stated, HP reserves the right to assert that any of the Asserted Claims are invalid for failing to properly name the true inventors of either patent, pursuant to at least 35 U.S.C. §§ 101, 115(a), and/or pre-AIA 35 U.S.C. § 102(f). For example, HP believes the ’437 Patent may be invalid on this basis because there is a discrepancy in the listed inventors between the ’437 patent (Seung Ho Hwang, Jano Banks, Paul Daniel Wolf, Eric Lee, Baegin Sung, and Albert M. Scalise as inventors) and several related patents. *See* U.S. Patent No. 7,558,326 (which lists James D. Lyle, Gyudong Kim, Min-Kyu Kim, Ken-Sue Tan, Paul Daniel Wolf, William C. Altmann, and Russel A. Martin as inventors); U.S. Patent No. 7,257,163 (which lists Seung Ho Hwang, Jano Banks, Paul Daniel Wolf, Eric Lee, William Sheet, and Albert M. Scalise as inventors); and U.S. Patent No. 6,914,637 (which lists Paul Daniel Wolf, John D. Banks, Stephen J. Keating, Duane Siemens, Eric Lee, Albert M. Scalise, Gijung Ahn, Seung Ho Hwang, Keewook Jung, James D. Lyle, Michael Anthony Schumacher, and Vladimir Grekhov as inventors).

V. INVALIDITY UNDER 35 U.S.C. §§ 102, 103

The following contentions are subject to revision and amendment pursuant to Federal Rule of Civil Procedure 26(e) and the Orders of record in this matter to the extent appropriate, *e.g.*, in light of further investigation and discovery regarding these defenses, the Court's construction of the claims at issue, and/or review and analysis of expert witnesses. HP offers these Invalidity Contentions in response to Plaintiff's Infringement Contentions and without prejudice to any position it may ultimately take as to any claim construction issues, as noted above.

As detailed below and in the attached claim charts, the concepts disclosed and claimed in the Asserted Patents are not new. Rather, the concepts have been disclosed and actively practiced by others prior to the claimed priority date. The prior art includes various documents, systems, products, patents and inventions that separately and together render the Asserted Claims invalid. HP asserts that at least the prior art listed below, individually or in combination, invalidates the asserted claims. HP provides below prior art that anticipates and/or renders obvious the Asserted Claims of the Asserted Patents. The identification of prior art below is not exhaustive, and HP's production contains additional references that render the Asserted Claims invalid. Although HP provides prior art for each Asserted Patent, HP reserves the right to rely on any of the prior art listed in its Invalidity Contentions and in the Invalidity Contentions served by any defendant in this consolidated action or any other action and proceedings with respect to the Asserted Patents, even if it is not listed under a specific Asserted Patent for anticipation and/or obviousness. HP reserves the right to rely on any permutation of combination of prior art listed in its Invalidity Contentions, even if the combination is not expressly stated in the Invalidity Contentions. HP reserves the right to rely upon both the listed and unlisted references, as well as other art that may become known and/or relevant during the course of this or related litigation.

The attached exhibits provide detailed claim charts for the Asserted Patents. The claim charts show where each claim limitation may be found in the particular reference being charted. For those references for which detailed claim charts are not provided in the aforementioned exhibits, those additional prior art references are otherwise pertinent to the invalidity of the Asserted Patents, either alone or in combination with other references. At this time, HP may not provide claim charts for each of these additional references, for any of a variety of reasons, such as: because the references are cited in conjunction with primary references for which charts have already been provided and are cited therein, because the references have similar disclosure to the prior art references for which invalidity charts have been provided, because the references may be used to show the state of the art, and/or because HP's investigation of the references is ongoing. HP reserves the right to rely on the uncharted references, for example, to address claim construction, findings regarding the priority date of the claims, and/or positions that Plaintiff or expert witnesses may take in the future concerning infringement and/or invalidity issues.

The references cited herein disclose the limitations of the Asserted Claims explicitly or inherently, and/or they may be relied upon to demonstrate how the state of the art in the relevant time frame invalidates each asserted patent claim. In the context of the knowledge of a person of ordinary skill in the art, each reference's disclosure applies in the context of both anticipation and obviousness. Therefore, any suggested single reference obviousness positions and obviousness combinations are provided in the alternative to HP's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is somehow deficient or is not by itself anticipatory. Further, the combinations listed herein are exemplary and not exhaustive. There are many possible invalidating combinations of the references listed herein, and it is not

practical, at this early stage, to identify and list all potentially relevant combinations without the benefit of further factual investigation and the Court's claim construction.

HP not only relies upon the prior art disclosed herein, but also on any commercial embodiments and accompanying literature of the various assignees that correspond to the respective disclosures found within the prior art disclosed herein. The assignees' various and respective commercial embodiments and/or corresponding literature anticipate and/or render obvious the claims of the Asserted Patents for at least the reasons disclosed in these Invalidity Contentions and claim charts, as well as for other independent reasons found within the commercial embodiments and corresponding literature. HP also reserves the right to rely on related patents, published applications, foreign patents or publications, and other patent documents as necessary to establish prior art status or clarify the disclosures cited.

Further, in addition to the detailed bases for invalidity that HP provides below, HP contends that an analysis of secondary considerations further supports the view that each of the Asserted Claims is invalid as obvious. For example, evidence of simultaneous invention may be considered as a secondary consideration providing indicia of obviousness. *Geo M Martin Co. v. Alliance Machine Sys. Int'l LLC*, 618 F.3d 1294, 1304-05 (Fed. Cir. 2010). HP's Invalidity Contentions show that many companies and individuals had developed or were simultaneously developing the features claimed in the Asserted Patents. HP reserves the right to rely on any of the prior art references identified below as evidence of simultaneous invention and that the claimed invention is the product of ordinary mechanical or engineering skill.

Plaintiff has not identified any evidence supporting any secondary considerations of non-obviousness. For example, Plaintiff has not identified any evidence that it, or any predecessor in interest of the Asserted Patents, has developed a commercially successful product embodying the

claimed subject matter of these patents. Plaintiff has also provided no evidence that the Asserted Patents were directed to long felt, unresolved needs. On the contrary, the Asserted Patents addressed problems that had been handled successfully in the prior art. Additionally, and as outlined herein and in the attached exhibits, numerous prior art references anticipate the Asserted Claims of the Asserted Patents, so failure by others cannot be cited as a secondary consideration in favor of nonobviousness. Plaintiff also has not presented any evidence to suggest that others in the industry copied or praised the alleged inventions of the Asserted Patents. To the extent that others may have subsequently adopted a similar technique, HP asserts that they were in fact using well-known systems that predate the Asserted Patents. At the time of the alleged invention of the Asserted Patents, experts would not have been skeptical of the general approach or idea disclosed therein. The general ideas—e.g., audio-video data transmission and reception—had already been in widespread use for a long time, and none was patentable by the time the applicants filed their patent applications. Experts would have regarded the disclosures and matter claimed in the Asserted Patents as obvious.

HP reserves all rights to respond to any secondary considerations of non-obviousness raised by Plaintiff, including by updating, modifying, and/or adding to these Invalidity Contentions. HP also reserves the right to affirmatively rely on secondary considerations of obviousness to the extent necessary and appropriate.

A. The ’443 and ’224 Patents

1. Identification of Prior Art: P.R. 3-3(a)

Pursuant to Patent Rule 3-3 and subject to HP’s reservations of rights in these Invalidity Contentions, at least the prior art listed below, individually or in combination, invalidates the Asserted Claims of the ’443 and ’224 Patents. Exhibits 443-A through 443-O and Exhibits 224-A through 224-M provide detailed claim charts showing where each claim limitation may be found

in certain references listed below, either expressly or inherently as the reference would be understood by a person having ordinary skill in the art. For those references for which detailed claim charts are not provided in Exhibits 443-A through 443-O or Exhibits 224-A through 224-M, those additional prior art references are otherwise pertinent to the invalidity of the '443 and '224 Patents, either alone or in combination with other references.

The prior art references, systems, and products listed below and in the accompanying claim chart exhibits may be relied upon for certain limitations, state of the art, and background of the art; indicia of obviousness; as evidence of the level of skill in the art at the time of the filing of the Patents-in-Suit; and/or in support of assertions that it is proper to combine certain prior art references in certain ways.

Defendant also incorporates by reference each and every prior art reference of record in the prosecution of the Patents-in-Suit and patents or patent applications related to the Patents-in-Suit, the prior art referred to in the specifications of the Patents-in-Suit, as well as the prior art identified in any USPTO proceedings involving any of the Patents-in-Suit.

a. Prior Art Patents, Patent Applications, and Patent Publications

The following patents, patent applications, and patent application publications are prior art under 35 U.S.C. §§ 102(a), (b), and/or (e).[2]

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	3,870,958	Dec. 11, 1973	Mar. 11, 1975	Rypinski
US	3,909,727	Apr. 19, 1974	Sept. 30, 1975	Hughes
US	3,927,376	Dec. 23, 1974	Dec. 16, 1975	Ferrie
US	3,939,431	Nov. 25, 1974	Feb. 17, 1976	Cohlman

[2] Under the America Invents Act ("AIA"), invalidating prior art is defined in 35 U.S.C. § 102(a). However, AIA Section 102(a) was not effective until March 17, 2013. The '443 and '224 Patents purport to predate March 17, 2013, and therefore pre-AIA Section 102 (including sub-sections 102(a), (b), (e) and (g)) apply to the prior art identified in these Invalidity Contentions and the attached exhibits.

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	4,020,421	Mar. 23, 1976	Apr. 26, 1977	Elder
US	4,344,175	Dec. 22, 1980	Aug. 10, 1982	Leslie
US	4,430,742	Nov. 20, 1981	Feb. 7, 1984	Milleker
US	4,553,129	Aug. 5, 1983	Nov. 12, 1985	McNesby
US	4,901,168	Apr. 11, 1988	Feb. 13, 1990	Yoshida
US	4,975,775	Nov. 15, 1988	Dec. 4, 1990	Satoh
US	5,228,059	Feb. 7, 1992	Jul. 13, 1993	Takegahara
US	5,313,458	June 2, 1992	May 17, 1994	Suzuki
US	5,400,305	Jul. 8, 1993	Mar. 21, 1995	Sadanaka
US	5,420,640	Dec. 3, 1993	May 30, 1995	Munich
US	5,548,346	Nov. 4, 1994	Aug. 20, 1996	Mimura
US	5,668,601	Feb. 13, 1995	Sep. 16, 1997	Okada
US	5,577,044	Mar. 11, 1994	Nov. 19, 1996	Oxford ’044
US	5,751,806	Dec. 18, 1996	May 12, 1998	Ryan
US	5,812,734	Sept. 11, 1996	Sept. 22, 1998	Shimoda
US	5,819,048	Jul. 2, 1996	Oct. 6, 1998	Okazaki
US	5,892,746	Jun. 13, 1997	Apr. 6, 1999	Heo
US	5,896,374	Oct. 22, 1996	Apr. 20, 1999	Okumura
US	5,946,298	Apr. 5, 1996	Aug. 31, 1999	Okuyama
US	5,987,417	Feb. 7, 1997	Nov. 16, 1999	Heo ‘417
US	6,028,542	Nov. 3, 1995	Feb. 22, 2000	Fukui
US	6,047,036	May 2, 1997	Apr. 4, 2000	Schnizlein
US	6,094,638	Aug. 5, 1998	July 25, 2000	Ema
US	6,108,622	Jun. 26, 1998	Aug. 22, 2000	Xue
US	6,115,537	Feb. 17, 1995	Sept. 5, 2000	Yamada
US	6,133,937	July 22, 1998	Oct. 17, 2000	Van Gestel
US	6,141,354	Dec. 8, 1997	Oct. 31, 2000	Nagatsugawa
US	6,147,950	Oct. 7, 1997	Nov. 14, 2000	Sakamoto
US	6,175,592	Mar. 12, 1997	Jan. 16, 2001	Kim
US	6,212,199	Mar. 18, 1997	Apr. 3, 2001	Oxford ’199
US	6,222,983	Mar. 15, 2000	Apr. 24, 2001	Heo (the “983 patent”)
US	6,226,320	May 7, 1996	May 1, 2001	Hakkinen
US	6,226,608	Jan. 28, 1998	May 1, 2001	Fielder
US	6,324,126	Apr. 20, 1999	Nov. 27, 2001	Nagano
US	6,363,209	Oct. 14, 1998	Mar. 26, 2002	Sako
US	6,377,862	Feb, 18, 1998	Apr, 23, 2002	Naruki et al.
US	6,449,227	Mar. 25, 1998	Sept. 10, 2002	Heo
US	6,522,417	Apr. 27, 1998	Feb. 18, 2003	Kakigahara
US	6,665,873	Mar. 23, 1998	Dec. 16, 2003	Van Gestel
US	6,738,561	Nov. 18, 1998	May 18, 2004	Tanaka
US	6,928,060	Mar. 19, 1999	Aug. 9, 2005	Kikuchi
JP	2538575B2	Jan. 23, 1986	Sept. 25, 1996	Edowaado
JP	2621688B2	May 13, 1991	June 18, 1997	Masayuki

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
JPH	0744140Y2	June 17, 1988	Oct. 9, 1995	Hirai
JPH	08331067A	May 31, 1995	Dec. 13, 1996	Tetsuya
JPH	0850781A	Dec. 21, 1994	Dec. 16, 1998	Kim
JPH	09200213A	Jan. 11, 1996	July 31, 1997	Soshino
JPS	62501948	Jan. 23, 1986	Jul. 30, 1987	Teiraa
EP	0883125A2	May 29, 1998	Dec. 9, 1998	Heo
WIPO	WO93/18607	Mar. 12, 1993	Sept. 16, 1993	Wilby

b. Non-Patent Publications

The following non-patent publications are prior art under 35 U.S.C. §§ 102(a) and/or (b).

Title	Author/Publisher	Date of Publication
Digital Audio Compression Standard (AC-3), Doc. A/52,	Advanced Television Systems Committee	Dec. 20, 1995
Engineering Guidelines The EBU/AES Digital Audio Interface	Emmet, John; European Broadcasting Union	Sept. 29, 1995
Digital Audio Coding: Dolby AC-3; Digital Signal Processing Handbook	Davidson, G.A; Dolby Laboratories, Inc.	1999
Digital Signal Processing Handbook	Madisetti, Vijayl; Williams, Douglas Chapman & Hall	1999
Multichannel stereophonic sound system with and without accompanying picture	ITU Radiocommunication Assembly;	1992-1994
Interfacing I2S-Compatible Audio Devices to the ADS-21065L Serial Ports, Version 1.0A	Tomaakos, John; ADI DSP Applications	April 2, 1999
Cirrus Logic CS4340/ CS4341 24-Bit, 96-kHz Stereo D/A Converter for Audio	Cirrus Logic	1999
Digital audio interface— Part 1: General	IEC	1999
Digital audio interface (English Version)	IEC	1989
Amendment A1 to the English Version of EN 60958 Digital audio interface	IEC	1993
Digital audio interface— Part 2: Software information delivery mode	IEC	1994
Operating Manual Mark Levinson No. 37 CD Transport	Mark Levinson; Madrigal Audio Laboratories, Inc.	1998
Meridian 800 Series	Boothroyd Stuart Meridian	Jan. 1999

Title	Author/Publisher	Date of Publication
Operating Instructions Compact Disc/Laservision Player CLD-01010 NTSC	Pioneer	1993
Operating Instructions CD-CDV-LD Player CLD-97 NTSC	Pioneer	1993
Operating Instructions CD-CDV-LD Player CLD-99 Elite NTSC	Pioneer	1993
Digital Audio Tape Deck Operating Instructions (DTC-59ES)	Sony Corporation	1992
DSP6000A Digital Studio-Transmitter Link	Moseley	August 1997

c. Prior Art Systems

The Asserted Claims of the '443 and '224 Patents are invalid under 35 U.S.C. § 102(a) and (b) because it was known by others, publicly used, and on sale in the United States before it was purportedly invented and more than one year before the priority date of the Asserted Claims. Additionally, the Asserted Claims are invalid under 35 U.S.C. § 102(g) because any purported invention was made in this country by another who had not abandoned, suppressed, or concealed the purported invention. For example, the foregoing patents and publications are evidence of such prior art systems and inventions. Additionally, HP relies on the systems identified in the Exhibits hereto and also the systems identified below.

System	Date of Prior Invention, Sale, Use, Or Knowledge
Sony Digital Audio Tape Decks (*e.g.*, Sony DTC-59ES, DTC-77 ES, DTC-c90)	As of 1992
Pioneer CD-CDV-LD Players (*e.g.*, CLD-97, CLD-99, and CLD-1010)	As of 1993
Meridian 800 Series (800 Reference CD Machine, 800 Reference DVD Player, 800 Reference Surround Processor 861)	As of January 1999
Madrigal Audio Laboratories Mark Levisons No. 37	As of April 1998
Cirrus Logic CS4340 and CS4341 24-Bit, 96-kHz Stereo D/A Converter	As of April 1999
Moseley DSP6000A Digital Studio-Transmitter Link	As of August 1997

d. Bases for Anticipation and/or Obviousness

Each prior art reference identified in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M expressly, implicitly, or inherently anticipates and/or renders obvious the Asserted Claims of the '443 and '224 Patents, either alone or in combination with other prior art references (*e.g.*, the references identified in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M or other references identified above) or the knowledge of the person of ordinary skill in the art at the time of the alleged invention. Each of the prior art references included in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M can be combined with any other prior art reference identified in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M, or identified above, to render obvious the Asserted Claims of the '443 and '224 Patents, and the examples of combinations below are intended for emphasis only.[3]

In the table below, HP identifies a non-exhaustive list of prior art references that, alone or in combination, anticipate and/or render obvious the Asserted Claims of the '443 and '224 Patents. Any prior art not identified, or any prior art combination not expressly identified in the table below in no way exhausts the types of combinations of references that would have naturally been considered as part of the exercise of ordinary skill by one skilled in the art.

Exhibit	References
443-A	Heo alone or in combination with one or more of Naruki, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, '983 Patent, and/or Moseley
443-B	Naruki alone or in combination with one or more of Heo, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, '983 Patent, and/or Moseley

[3] For example, each of Heo, Naruki, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, '983 Patent, and Moseley may be combined with each other to render obvious the Asserted Claim of the '224 and the '443 Patent.

Exhibit	References
443-C	Okumura alone or in combination with one or more of Heo, Naruki, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-D	Oxford ’044 alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley Fukui
443-E	Oxford ’199 alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-F	Sadanaka alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-G	Xue alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-H	The AC-3 Standard alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-I	EBU-AES, alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, Nagatsugawa, Tetsuya, Tanaka, and/or Fukui
443-J	Nagatsugawa alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Tetsuya, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-K	Tetsuya alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tanaka, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-L	Tanaka alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Schnizlein, Tetsuya, Fukui, Okuyama, ‘983 Patent, and/or Moseley
443-M	The ’983 Patent alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Schnizlein, Tetsuya, Tanaka, Okuyama, Fukui, and/or Moseley

Exhibit	References
443-N	The Okuyama alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Schnizlein,, Tetsuya, Tanaka, Fukui, ‘983 Patent, and/or Moseley
443-O	Moseley alone or in combination with one or more of Okuyama, Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, Fukui, and/or ‘983 Patent
224-A	Heo alone or in combination with one or more of Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya Fukui, Okuyama, and/or Moseley
224-B	Naruki alone or in combination with one or more of Heo, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-C	Okumura alone or in combination with one or more of Heo, Naruki, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-D	Oxford ’044 alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-E	Oxford ’199 alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-F	Sadanaka alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-G	Xue alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-H	The AC-3 Standard alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, EBU-AES, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley
224-I	EBU-AES, alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, Nagatsugawa, Tetsuya, Fukui, Okuyama, and/or Moseley

Exhibit	References
224-J	Nagatsugawa alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Tetsuya, Okuyama, Schnizlein, Fukui, Okuyama, and/or Moseley
224-K	Tetsuya alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, and/or Fukui
224-L	Okuyama alone or in combination with one or more of Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Schnizlein,,Tetsuya, Nagatsugawa Fukui, and/or Moseley
224-M	Moseley alone or in combination with one or more of Okuyama, Heo, Naruki, Okumura, Oxford ’044, Oxford ’199, Sadanaka, Xue, AC-3 Standard, EBU-AES, Nagatsugawa, Tetsuya, Tanaka, and/or Fukui

The accompanying claim charts (Exhibits 443-A through 443-O and Exhibits 224-A through 224-M) set forth example bases for anticipation and obviousness, identifying where each reference discloses, alone or in combination with other references, each limitation of the Asserted Claims of the ’443 and ’224 Patents on a limitation-by-limitation basis. HP’s claim charts are exemplary and not exhaustive.

e. Obviousness Combinations

Subject to HP’s reservation of rights, HP contends that all of the prior art references, as identified above and described in the charts attached as Exhibits 443-A through 443-O and Exhibits 224-A through 224-M, by themselves anticipate the Asserted Claims of the ’443 and ’224 Patents in accordance with 35 U.S.C. § 102 and/or render the Asserted Claims of the ’443 and ’224 Patents obvious under 35 U.S.C. § 103, as more specifically noted in the attached charts.

The cited portions of the prior art references are examples and representative of the content of the prior art references, and should be understood in the context of the reference as a whole, as understood by one of ordinary skill in the art. To the extent a cited prior art reference is deemed not to anticipate or render obvious a claim as noted in the attached charts for failing to teach or

suggest one or more limitations of that claim, that claim would nonetheless have been obvious to one of ordinary skill in the art at the time of the invention by the combination of the cited prior art reference with one or more other prior art references and/or common knowledge disclosing the missing claim limitations. For example, any of the references listed above, to the extent it does not explicitly or inherently disclose any limitation, could be combined with any one or more of the other references listed above which discloses that limitation.

HP reserves the right to supplement the obviousness arguments using any references listed above, or any references that may become known to HP during the course of discovery. Further, the suggested obviousness combinations are in addition to HP's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not anticipatory on its own.

f. Motivation to Combine and Reasonable Expectation of Success

With respect to the '443 and '224 Patents, the prior art identified above non-exhaustively illustrates the scope and content of the prior art. As detailed in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M, the prior art included each limitation recited in the Asserted Claims of the '443 and '224 Patents. To the extent a cited prior art reference is deemed not to anticipate a claim, the only difference between the claimed invention and the prior art is the lack of actual combination of the elements in a single prior art reference. However, for at least the reasons discussed above and the additional reasons discussed below, a POSITA would have been motivated to combine each of the above prior art references. A POSITA in the art pertaining to the Asserted Patents at the relevant time would have been someone with a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent training, as well as at least two years of experience working in the field of digital transmissions. A more advanced degree would require less work experience.

A POSITA would have numerous motivations to combine each of the above-referenced prior art. For example, as the United States Supreme Court held in *KSR*, "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." 550 U.S. at 416. The Supreme Court further held that, "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . .." *Id.* at 417. Accordingly, a person of skill in the art would have been motivated to combine or adapt known or familiar methods in the art.

The combinations of the prior art references identified above would have been obvious in view of: (1) the knowledge of persons of ordinary skill in the art; (2) the express, implied and inherent teachings of the prior art, or the interrelated teachings of multiple prior art references; (3) the nature of the problem being solved; (4) the fact that they are combinations of known methods to yield predictable results; (5) the fact that they involve a simple substitution of one known, equivalent element for another to obtain predictable results; (6) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces; (7) the existence of a known need or problem in the field of endeavor at the time of the invention(s); and/or (8) a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives

and/or market forces either in the same field or a different one. Furthermore, the combination of the prior art references identified above would have been obvious because the combination represents the known potential options with a reasonable expectation of success.

Indeed, to the extent the prior art references identified herein do not anticipate the Asserted Claim, the limitations of the Asserted Claim are merely obvious variations of the systems and methods disclosed in the various prior art references. As discussed below and in the prior art references identified in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M, the Asserted Claims includes only well-known, conventional technologies prior to the '443 and '224 Patents. The prior art identified herein and in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M reflects the common knowledge and state of the art prior to the Asserted Patents. The '443 and '224 Patents do not purport to have invented any of these technologies; rather, the '443 and '224 Patents simply tacked on these conventional prior art approaches to conventional and generic known prior techniques. As such, the Asserted Claims of the '443 and '224 Patents merely incorporates the knowledge of a POSITA. The mere amalgamation of such conventional technologies here is not inventive—it is simply combining or substituting well-known, conventional prior art elements according to known methods to yield predictable results.

For example, a person having ordinary skill in the art would have been motivated to combine the prior art identified in in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M, and would have held a reasonable expectation of success in doing so, based on the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons having ordinary skill in the art. Each reference in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M discloses methods and systems for transmission of data, including but not limited to audio data and audio related information. The references identified in Exhibits 443-A through

443-O and Exhibits 224-A through 224-M are analogous prior art to the subject matter of the Asserted Claims and are proper to combine. Because these prior art references exist within a single field of art—such as, for example, audio data transmission—particularly one in which individuals in the field often shared and/or collaborated on their work—for example, given the standardization of various transmission mechanisms in the industry—it would have been obvious for a POSITA to look from one piece of prior art to another to find any missing functionality they desired to implement, or to replace functionality in one prior art reference for that described in another reference. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’443 and ’224 Patents.

Combining the prior art references identified herein and in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M, which address similar problems as explained above, would have been obvious and straightforward to a POSITA. *First*, the combinations represent no more than the use of known techniques according to known methods in the same ways to yield predictable results. For example, the references generally address the same field of audio data transmission, and a POSITA would be motivated by such obvious considerations as enhancing the reliability and operation of serial data transmissions at the claimed time of invention. *Second*, the references themselves identify the known problems and provide known solutions to address those problems in the field. Indeed, the references identified herein and in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M demonstrate that there was, at the time of the alleged invention, a finite number of identified, predictable solutions for enhancing the reliability and operation of audio data transmissions that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious. *Third*, a POSITA would

appreciate that the combinations improve the systems in the prior art to transmit audio data, including by using conventional encoding techniques, providing more robust encoding techniques, providing subset selection rules, defining control words and their encoding, providing validity control information, providing mute signals, and/or describing transmission sequences for the serial link. *Fourth*, because the problems and solutions were known in the field, the particular arrangements and combinations of references would yield predictable results. *Fifth*, a number of the references themselves provide express motivations that would have led a person of ordinary skill to their combination. For example, the references acknowledge that preserving data, reducing interference and errors, and transmission sequencing can be important.

Below, HP has provided several additional examples of the motivations that a POSITA would have had to combine certain of the prior art references in Exhibits 443-A through 443-O and Exhibits 224-A through 224-M. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. Instead, in many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined.

As one example, methods and apparatus for digitally transferring audio data and audio-related information were well-known and within the skill of POSITAs at the time of the alleged invention. *See, e.g.*, Heo, Naruki, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, Nakatsugawa, Tetsuya, Tanaka, Fuikui, the AC-3 Standard, the EBU-AES Digital Audio Interface Engineering Guidelines, the '983 patent, Moseley, and Okuyama. For example, the AC-3 Standard

discloses the transmission of "digital audio signals" and "digital information needed to accurately reproduce the original pulse code modulation (PCM) samples." The AC-3 Standard, 2; Heo at 2:6-10 ("It is an object of the present invention to provide a DVD-Audio for storing digital audio signals sampled at the maximum sampling frequency and quantized in the maximum number of bits with the number of channels limited by the data transfer speed in linear PCM.") The '443 patent also concedes that "[c]onventional methods for digitally transferring audio data and audio related information" based on international standards were already being used "in a wide range of digital data transfer applications." '443 Patent, 1:21-26. These methods and systems included techniques for transferring audio data and audio-related information were disclosed by at least Heo, Naruki, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, Nakatsugawa, Tetsuya, Tanaka, Fukui, the AC-3 Standard, the EBU-AES Digital Audio Interface Engineering Guidelines, the '983 patent, Moseley, and Okuyama. *See, e.g.*, Exs. 443-A through 443-O, at claim elements [7(pre)], [7(a)], [7(b)], [7(c)]; Exs. 224-A to 224-M, at claim elements [3(pre)], [3(a)], [3(b)], [3(c)]. A POSITA would have been motivated to combine these references with each other and other references disclosing digitally transferring audio data and audio-related information, including references disclosing decoding or analyzing monitor information included with audio data to determine whether the audio data is capable of being properly reproduced, in order to prevent reproduction of incomplete, erroneous, or otherwise low-quality audio signals. A POSITA would have a reasonable expectation of success with combining these references because the references already describe application of similar or the same techniques for transferring audio data and audio-related information and would use known techniques to include monitor information in the audio-related information to prevent reproduction of incomplete audio signals, such as muting the incomplete audio, in predictable ways.

As a further example, methods of transmitting audio data and audio related information were well-known and within the skill of POSITAs at the time of the alleged invention. *See, e.g.*, Heo, Naruki, Okumura, Oxford '044, Oxford '199, Moseley, Sadanaka, Xue, Nakatsugawa, Tetsuya, Tanaka, Fukui, the '983 patent, Okuyama, the AC-3 Standard, and the EBU-AES Digital Audio Interface Engineering Guidelines. The '443 Patent itself concedes that "[c]onventional methods for digitally transferring audio and audio-related data" existed at the time of the alleged invention. '443 patent, 1:19-20. These transfer methods are disclosed by at least Heo, Naruki, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, Nakatsugawa, Tetsuya, Tanaka, the '983 patent, Moseley, and Okuyama, Fukui, the AC-3 Standard, and the EBU-AES Digital Audio Interface Engineering Guidelines. *See, e.g.*, Exs. 443-A through 443-O, at claim elements [7(pre)], [7(a)]; Exs 224-A to 224-M, at claim elements [3(pre)], [3(a)]. A POSITA would have been motivated to combine these transfer methods with references disclosing transmission of audio data because using a transmitter to transfer audio data is a well-known and frequently used concept that is widely implemented in the prior art.

As a further example, audio-related information including monitor information indicating playback requirements for audio reproduction or error control was well known at the time of the alleged invention. *See, e.g.*, Heo, Naruki, Okumura, Oxford '044, Oxford '199, Sadanaka, Xue, Nakatsugawa, Tetsuya, Tanaka, Fukui, the AC-3 Standard, and the EBU-AES Digital Audio Interface Engineering Guidelines, Moseley, the '983 patent, and Okuyama. The '443 patent itself recognizes that it was known that under "sampling conversion conditions, the sampling frequency of the transferred audio data differs from that of the original audio data," and thus that it would have been obvious to include audio-related information such as sampling frequency, speed transfer, or similar information with transmission of audio data to prevent interruptions in the

reproduction of the audio. ’443 patent, 2:33-36. This could include the audio-related information indicating other requirements for audio reproduction or for audio output, as disclosed by at least Heo, Nakatsugawa, Okumura, Sadanaka, Tetsuya, Tanaka, Fukui, the AC-3 Standard, Moseley, and the EBU-AES Digital Audio Interface Engineering Guidelines. *See, e.g.*, Exs. 443-A through 443-O at claim element [7(c)]; Exs. 224-A through 224-M at claim element [3(c)]. For example, Heo explains a method of playing DVD audio that includes “reading the data of the position of an audio title selected according to the position information of the AMG when receiving a command for reproducing the audio title, and setting the audio decoder to carry out the algorithm for reproducing the audio title by reading the audio stream attribute of the audio title set information management table (ATSI AMT).” Heo at 2:61-67. Naruki explains providing audio reproduction control information so that “after the packed data is read out, levels of pieces of audio data of the digital audio signal are adjusted according to the particular audio reproduction control information.” Naruki, Abstract. Okumura includes “error detecting code” in transmitted data useful when employing variable rate transmission methods to “make[] it possible to transmit variable length data without informing the receiving side of the data length in each frame.” Okumura, Abstract. Oxford ’044 includes control data that “may be used to cause the audio converter to adjust gain settings, input selector settings, mute, etc.” Oxford ’044 at 10:13-15. Sadanaka includes control information when a “digital audio signal time-division multiplexed in such a way that the frame interval of the video signal does not accord with the frame interval of the digitized audio signal” or when “the apparatus sets an audio output mute flag of a control code contained in the digitized audio signal.” Sadanaka 2:45-52. Xue includes control logic during decoding of audio data that considers synchronization signals, frame information, emphasis flags, control logic, and mute flags. *See* Xue at 9:5-36. Fukui describes using the AES standard in

combination with sampling frequency detection control information to "such input digital signal can be restored to the signal of the inherent sampling signal, while the pitch may also be restored to the inherent pitch." Fukui at 2:34-39. Moseley describes using the EBU-AES Digital Audio Interface Engineering Guidelines to transmit and receive audio data including using validity flags for error correction or muting. Moseley at Appendix A-7. A POSITA would have been motivated to combine these references with each other because they teach similar techniques of monitoring audio-related information indicating playback requirements or error correction or control. A POSITA would have a reasonable expectation of success with combining these references because the references teach using the same or similar audio-related information, the same or methods and techniques for using audio-related information and including such audio-related information in audio data transmission improved reception, coordination among devices, and audio quality.

As a further example, muting audio data that is not capable of being monitored was well known at the time of the alleged invention. *See, e.g.*, Heo, Naruki, Oxford '044, Sadanaka, Nakatsugawa, Tetsuya, Tanaka, the AC-3 Standard, Moseley, and the EBU-AES Digital Audio Interface Engineering Guidelines; Exs. 443-A through 443-O; 224-A through 224-M. A POSITA would have been motivated to combine these references teaching this technique of muting audio not capable of being monitored with each other and other references disclosing receiving audio-related information including monitor information indicating that audio is not capable of being monitored because it would prevent audible reproduction of interrupted or otherwise low-quality audio data. A POSITA would have a reasonable expectation for success with combining these references because muting audio was a well-known and conventional way of preventing audible reproduction of audio data. Moreover, a POSITA would recognize that the muting step in Heo, Naruki, Oxford '044, Sadanaka, Nakatsugawa, Tetsuya, Tanaka, Moseley, the AC-3 Standard, and

the EBU-AES Digital Audio Interface Engineering Guidelines would be useful in preventing the audible reproduction of interrupted audio data, and accordingly would be motivated to combine these references to improve audio quality. A POSITA would have a reasonable expectation of success with combining these references because muting audio was a well-known and conventional way to prevent unwanted reproduction of audio signals. A POSITA would have a reasonable expectation for success with combining these references because muting audio was a well-known and conventional way of preventing audible reproduction of audio data.

As a further example, a POSITA would be motivated to combine the AC-3 Standard, Oxford 199, and/or Nakatsugawa with the EBU-AES Digital Audio Interface Engineering Guidelines. A POSITA would have been motivated to combine these references because the AC-3 Standard, the EBU/AES Digital Audio Interface Engineering Guidelines, and Nakatsugawa each discloses a "validity" bit or flag included in the audio-related information. AC-3 Standard, 119; Nakatsugawa, Fig. 5; Oxford '199 at Fig. 2; The EBU-AES Digital Audio Interface Engineering Guidelines, 27-28. The EBU-AES Digital Audio Interface Engineering Guidelines discloses a "Validity, V, bit in the interface [that] gives a warning that an audio sample is not 'suitable for conversion to an analogue audio signal" and that muting the audio occurs when the validity bit is set to "1". The EBU-AES Digital Audio Interface Engineering Guidelines, 27-28. A POSITA would have a reasonable expectation of success with combining these references because muting audio was a well-known and conventional way of preventing audible reproduction of audio data. In fact, Moseley describes implementing these features of the EBU-AES Digital Audio Interface Engineering Guidelines in its product. Moseley at Appendix A-7.

As a further example, a POSITA would be motivated to combine Okuyama with Schnizlein. A POSITA would be motivated to combine these references because Schnizlein

discloses muting audio data experiencing severe conditions, high bit errors, or temporary loss of signal similar to the transfer rate information disclosed in Schnizlein and Okuyama. Schnizlein, 1:32-54; Okuyama, 11:32-49. A POSITA would recognize that the muting step in Schnizlein would be useful in preventing the audible reproduction of interrupted audio data, and accordingly would be motivated to combine Schnizlein with Okuyama to improve audio quality. A POSITA would have a reasonable expectation of success with combining these references because muting audio was a well-known and conventional way to prevent unwanted reproduction of audio signals. A POSITA would have a reasonable expectation for success with combining these references because muting audio was a well-known and conventional way of preventing audible reproduction of audio data.

Much of the art identified above and in the attached Exhibits reflects common knowledge and the state of the art prior to the filing date of the ’443 and ’224 Patents and/or at the time the alleged invention was made. In many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations.

B. The’ 282 Patent

1. Identification of Prior Art: P.R. 3-3(a)

Pursuant to Patent Rule 3-3 and subject to HP’s reservations of rights in these Invalidity Contentions, at least the prior art listed below, individually or in combination, invalidates the Asserted Claim of the ’282 Patent. Exhibits 282-A through 282-O provide detailed claim charts showing where each claim limitation may be found in certain references listed below, either

expressly or inherently as the reference would be understood by a person having ordinary skill in the art. For those references for which detailed claim charts are not provided in Exhibits 282-A through 282-O, those additional prior art references are otherwise pertinent to the invalidity of the '282 Patent, either alone or in combination with other references.

The prior art references, systems, and products listed below and in the accompanying claim chart exhibits may be relied upon for certain limitations, state of the art, and background of the art; indicia of obviousness; as evidence of the level of skill in the art at the time of the filing of the Patents-in-Suit; and/or in support of assertions that it is proper to combine certain prior art references in certain ways.

Defendant also incorporates by reference each and every prior art reference of record in the prosecution of the Patents-in-Suit and patents or patent applications related to the Patents-in-Suit, the prior art referred to in the specifications of the Patents-in-Suit, as well as the prior art identified in any USPTO proceedings involving any of the Patents-in-Suit.

a. Prior Art Patents, Patent Applications, and Patent Publications

The following patents, patent applications, and patent application publications are prior art under 35 U.S.C. §§ 102(a), (b), and/or (e). [4]

Country	Patent/App./ Pub. No.	Filing Date	Publication Date	Inventor
US	3,937,882	Apr. 11, 1974	Feb. 10, 1976	Bingham
US	4,689,740	Nov. 2, 1981	Aug. 25, 1987	Moelands
US	4,711,976	Dec. 3, 1985	Dec. 8, 1987	Narjes
US	4,737,950	May 31, 1985	Apr. 12, 1988	Fechalos
US	4,818,994	Oct. 22, 1987	Apr. 4, 1989	Orth
US	5,008,879	Nov. 14, 1988	Apr. 16, 1991	Fischer

[4] Under the America Invents Act ("AIA"), invalidating prior art is defined in 35 U.S.C. § 102(a). However, AIA Section 102(a) was not effective until March 17, 2013. The '282 Patent purports to predate March 17, 2013, and therefore pre-AIA Section 102 (including sub-sections 102(a), (b), (e) and (g)) apply to the prior art identified in these Invalidity Contentions and the attached exhibits.

Country	Patent/App./ Pub. No.	Filing Date	Publication Date	Inventor
US	5,142,538	Apr. 19, 1990	Aug. 25, 1992	Fickes
US	5,293,375	Aug. 14, 1992	Mar. 8, 1994	Moorwood
US	5,422,884	May 6, 1991	June 6, 1995	Goertz
US	5,535,373	Feb. 15, 1995	July 9, 1996	Olnowich
US	5,557,780	Apr. 20, 1995	Sept. 17, 1996	Edwards
US	5,559,502	Jan. 14, 1993	Sept. 24, 1996	Schutte
US	5,564,061	Feb. 25, 1994	Oct. 8, 1996	Davies
US	5,617,418	Nov. 1, 1993	Apr. 1, 1997	Shirani
US	5,640,446	May 1, 1995	June 1, 1997	Everett
US	5,657,452	Sept. 8, 1995	Aug. 12, 1997	Kralowetz
US	5,778,189	Jan. 21, 1997	July 7, 1998	Kimura
US	5,819,051	Dec. 29, 1995	Oct. 6, 1998	Murray
US	5,852,406	May 5, 1995	Dec. 22, 1998	Edde
US	5,878,234	Sept. 10, 1996	Mar. 2, 1999	Dutkiewicz
US	5,938,752	May 20, 1997	Aug. 17, 2000	Leung
US	6,122,679	Mar. 13, 1998	Sept. 19, 2000	Wunderlich
US	6,219,697	May 2, 1997	Apr. 17, 2001	Lawande
US	6,233,613	Aug. 18, 1997	May 15, 2001	Walker
US	6,381,666	Feb. 18, 2000	Apr. 30, 2002	Kejser
US	6,397,277	May 19, 1999	May 28, 2002	Kato
US	6,425,019	Feb. 17, 1998	July 23, 2002	Tateyama
US	6,557,068	Dec. 22, 2000	Apr. 29, 2003	Riley
US	6,609,167	Mar. 15, 2000	Aug. 19, 2003	Bastiani
US	6,678,535	June 30, 2000	Jan. 13, 2004	Narayanaswami
US	6,731,201	Feb. 23, 2000	May 4, 2004	Bailey
US	6,735,658	Oct. 6, 2000	May 11, 2004	Thornton
US	6,738,823	June 31, 2000	May 18, 2004	Pierce
US	6,738,856	July 19, 2000	May 18, 2004	Milley
US	6,754,209	Aug. 28, 1998	June 22, 2004	Stachura
US	6,804,776	Sept. 21, 1999	Oct. 12, 2004	Lothberg
US	6,839,413	Feb. 22, 2000	Jan. 4, 2005	Brock
US	6,851,001	Feb. 8, 1999	Feb. 1, 2005	Oudet
US	6,867,749	Apr. 23, 1999	Mar. 15, 2005	Il
US	6,874,052	Sept. 29, 2000	Mar. 29, 2005	Delmonico
US	6,961,347	June 20, 2000	Nov. 1, 2005	Bunton
US	6,963,561	Dec. 15, 2000	Nov. 8, 2005	Lahat
US	6,996,112	Apr. 30, 2001	Jan. 3, 2002	Fukunaga
US	7,035,290	Feb. 27, 2002	Apr. 25, 2006	Lyle
US	7,060,006	Aug. 18, 2000	Jun. 13, 2006	Waterson
US	7,110,396	Aug. 20, 2001	Sept. 19, 2006	Saha
US	7,131,004	Aug. 31, 2001	Oct. 31, 2006	Lyle
US	7,138,989	July 25, 2003	Nov. 21, 2006	Mendelson
US	7,391,760	Aug. 21, 2000	June 24, 2008	Caldwell

Country	Patent/App./ Pub. No.	Filing Date	Publication Date	Inventor
US	7,392,389	Jan. 11, 2002	June 24, 2008	Kori
US	7,734,758	July 19, 2000	June 8, 2010	Lo Bue
US	2001/0040631	Jan. 3, 2001	Nov. 15, 2001	Ewedemi
US	2002/0059479	Nov. 9, 2001	May 16, 2002	Hardy
US	2002/0090001	Feb. 11, 2002	July 11, 2002	Beckwith
US	2002/0108011	Dec. 11, 2000	Aug. 8, 2002	Tanha
US	2002/0112070	Dec. 14, 2000	Aug. 15, 2002	Ellerbrock
US	2002/0141418	Mar. 19, 1999	Oct. 3, 2002	Ben-Dor
US	2002/0144048	Mar. 31, 2001	Oct. 3, 2002	Bolt
US	2002/0174277	Mar. 26, 2002	Nov. 21, 2002	Hoshino
US	2002/0178291	Mar. 22, 2001	Nov. 28, 2002	Senthil
US	2002/0181604	Apr. 27, 2001	Dec. 5, 2002	Chen
US	2002/0223377	May 31, 2002	Dec. 4, 2003	Simmons
US	2003/0056043	Sept. 18, 2001	Mar. 20, 2003	Kostadinov
US	2003/0061307	Nov. 4, 2002	Mar. 27, 2003	Daswani
US	2003/0079075	Oct. 19, 2001	Apr. 24, 2003	Asseline
US	2004/0039466	May 23, 2003	Feb. 26, 2004	Lilly
US	2004/0039927	Oct. 23, 2001	Feb. 26, 2004	Hazama
US	2004/0095509	Mar. 25, 2002	May 20, 2004	Okamoto
US	2004/0114612	Aug. 14, 2001	June 17, 2004	Even
US	2004/0136456	May 9, 2002	July 15, 2004	Ogden
DE	3142115A1	Oct. 23, 1981	May 5, 1983	Singer
EP	0170638A2	July 26, 1985	Feb. 5, 1986	Miceli
EP	0759593A2	Aug. 21, 1996	Feb. 26, 1997	Iderup
EP	0945807A1	Mar. 27, 1998	Sept. 29, 1999	Oudet
GB	2388501A	May 9, 2002	Nov. 12, 2003	Page
JP	2000059788A	July 15, 1998	Feb. 25, 2000	Tawara
JPH	04253445A	Jan. 30, 1991	Sept. 9, 1992	Otsuka
KR	19980040076A	Nov. 28, 1996	Aug. 17, 1998	Kim
KR	100283401B1	Oct. 30, 1998	Mar. 2, 2001	Kim
KR	0164835B1	Jan. 29, 1996	Feb. 1, 1999	Ko
WO	00/16525	Sept. 10, 1999	Mar. 23, 2000	Kim
WO	02/44836	Nov. 16, 2001	June 6, 2002	Zhao
WO	02/30086	May 22, 2001	Apr. 11, 2002	Cooper
WO	02/088975	Apr. 24, 2002	Nov. 7, 2002	McLeod

b. Non-Patent Publications

The following non-patent publications are prior art under 35 U.S.C. §§ 102(a) and/or (b).

Title	Author/Publisher	Date of Publication
Digital Visual Interface DVI	Digital Display Working Group	Apr. 2, 1999
PCF8584 I^2C-bus controller Data Sheet	Philips	Oct. 21, 1997
Using the P82B96 for bus interface	Philips	Feb. 14, 2001
I2C – RS-485 adapter	Ala-Paavola	Sept. 29, 2001
The I^2C-Bus Specification Version 2.1 ("I^2C Specification 2000")	Philips Semiconductors	Jan. 2000
P1394a Draft Standard for a High Performance Serial Bus (Supplement) ("IEEE-1394 Specification")	IEEE	June 30, 1999
PCI Local Bus Specification Revision 2.1 ("PCI v2.1")	PCI Special Interest Group	June 1, 1995
Echo Protocol ("RFC-862")	Postel; ISI	May 1983
Universal Serial Bus Specification Revision 2.0 ("USB-2.0 Specification")	Compaq Computer Corp. et al.	Apr. 27, 2000
ESTI EN 301 401 V1.2.5 Attachment requirements for Data Terminal Equipment (DTE)	ETSI	Aug. 1999
Definition of Managed Objects for SNA Data Link Control (SDLC) using SMIv2	Hilgeman et al.; Network Working Group	Jan. 1995
East Coast Datacom 232-V35 Technical Information	East Coast Datacom	Jan. 1, 2002
232-V35 Interface Converter	East Coast Datacom	2001
Operations Manual Universal Interface Converter UIC	East Coast Datacom	May 22, 2000
Interface Converter, V.24 to V.35 2020P Installation and Operations Manual	Patton Electronics Company	May 11, 2000
Interface Converter, V.24 to X.21 2021P Installation and Operations Manual	Patton Electronics Company	Feb. 21, 2000
User Manual Model 2015 Interface Powered RS-449/422 to V.35 Converter	Patton Electronics Company	Dec. 31, 1996
The I^2C-bus and how to use it (including specifications)	Philips Semiconductors	1995
Philips I^2C Bus Introducing the P82B96 bus buffer	Philips Semiconductor	May 2001

Title	Author/Publisher	Date of Publication
RFC-894 A Standard for the Transmission of IP Datagrams over Ethernet Networks	Hornig	April 1984

c. Prior Art Systems

The Asserted Claim of the '282 Patent is invalid under 35 U.S.C. § 102(a) and (b) because it was known by others, publicly used, and on sale in the United States before it was purportedly invented and more than one year before the priority date of the Asserted Claim. Additionally, the Asserted Claim is invalid under 35 U.S.C. § 102(g) because any purported invention was made in this country by another who had not abandoned, suppressed, or concealed the purported invention. For example, the foregoing patents and publications are evidence of such prior art systems and inventions. Additionally, HP relies on the systems identified in the Exhibits hereto and the systems identified below.

System	Date of Prior Invention, Sale, Use, Or Knowledge
RS-485 Adapter	No later than September 28, 2001
Philips Semiconductors I^2C Bus Interface Systems based on, *e.g.*, 82B96, 82C250, PCF8584, etc.	No later than Oct 21, 1997

d. Bases for Anticipation and/or Obviousness

Each prior art reference identified in Exhibits 282-A through 282-O expressly, implicitly, or inherently anticipates and/or renders obvious the Asserted Claim of the '282 Patent, either alone or in combination with other prior art references (*e.g.*, the references identified in Exhibits 282-A through 282-O or other references identified above) or the knowledge of the person of ordinary skill in the art at the time of the alleged invention. Each of the prior art references included in Exhibits 282-A through 282-O can be combined with any other prior art reference identified in

Exhibits 282-A through 282-O, or identified above, to render obvious the Asserted Claim of the ’282 Patent, and the examples of combinations below are intended for emphasis only.

In the table below, HP identifies a non-exhaustive list of prior art references that, alone or in combination, anticipate and/or render obvious the Asserted Claim of the ’282 Patent. Any prior art not identified, or any prior art combination not expressly identified in the table below in no way exhausts the types of combinations of references that would have naturally been considered as part of the exercise of ordinary skill by one skilled in the art.

Exhibit	Reference(s)
282-A	Asseline either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-B	McLeod either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-C	Zhao either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-D	Brock either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-E	Najes either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell

Exhibit	Reference(s)
282-F	Ko either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-G	Pierce either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-H	Delmonico either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-I	Bingham either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-J	Kejser either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-K	Philips I^2C Bus Interface Systems either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Thorton, RS-485 Adapter, Ben-Dor, Caldwell
282-L	Thorton either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, RS-485 Adapter, Ben-Dor, Caldwell
282-M	RS-485 Adapter either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley,

Exhibit	Reference(s)
	Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, Ben-Dor, Caldwell
282-N	Ben-Dor either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Asseline, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Caldwell
282-O	Caldwell either alone or in combination with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, Moelands, Schutte, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Riley, Bunton, RFC-862, Asseline, McLeod, Zhao, Brock, Najes, Ko, Pierce, Delmonico, Bingham, Kejser, Philips I^2C Bus Interface Systems, Thorton, RS-485 Adapter, Ben-Dor

The accompanying claim charts (Exhibits 282-A through 282-O) set forth example bases for anticipation and obviousness, identifying where each reference discloses, alone or in combination with other references, each limitation of the Asserted Claim of the ’282 Patent on a limitation-by-limitation basis. HP’s claim charts are exemplary and not exhaustive.

e. Obviousness Combinations

Subject to HP’s reservation of rights, HP contends that all of the prior art references, as identified above and described in the charts attached as Exhibits 282-A through 282-O, by themselves anticipate the Asserted Claim of the ’282 Patent in accordance with 35 U.S.C. § 102 and/or render the Asserted Claim of the ’282 Patent obvious under 35 U.S.C. § 103, as more specifically noted in the attached charts.

The cited portions of the prior art references are examples and representative of the content of the prior art references, and should be understood in the context of the reference as a whole, as understood by one of ordinary skill in the art. To the extent a cited prior art reference is deemed not to anticipate or render obvious a claim as noted in the attached charts for failing to teach or suggest one or more limitations of that claim, that claim would nonetheless have been obvious to

one of ordinary skill in the art at the time of the invention by the combination of the cited prior art reference with one or more other prior art references and/or common knowledge disclosing the missing claim limitations. For example, any of the references listed above, to the extent it does not explicitly or inherently disclose any limitation, could be combined with any one or more of the other references listed above which discloses that limitation.

HP reserves the right to supplement the obviousness arguments using any references listed above, or any references that may become known to HP during the course of discovery. Further, the suggested obviousness combinations are in addition to HP's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not anticipatory on its own.

f. Motivation to Combine and Reasonable Expectation of Success

With respect to the '282 Patent, the prior art identified above demonstrates the scope and content of the prior art. As detailed in Exhibits 282-A through 282-O, the prior art included each limitation recited in the Asserted Claim of the '282 Patent. To the extent a cited prior art reference is deemed not to anticipate a claim, the only difference between the claimed invention and the prior art is the lack of actual combination of the elements in a single prior art reference. However, for at least the reasons discussed above and the additional reasons discussed below, a POSITA would have been motivated to combine each of the above prior art references. A POSITA in the art pertaining to the '282 Patent at the relevant time would have been someone with either: (i) a Master of Science in Electrical Engineering, or an equivalent field, or (ii) a Bachelor of Science in Electrical Engineering or an equivalent field as well as at least two years of experience in the design of audio-video connectors. A more advanced degree would require less work experience.

A POSITA would have had numerous motivations to combine each of the above-referenced prior art. For example, as the United States Supreme Court held in *KSR*, "[t]he combination of

familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." 550 U.S. at 416. The Supreme Court further held that, "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . .." *Id.* at 417. Accordingly, a person of skill in the art would have been motivated to combine or adapt known or familiar methods in the art.

One or more combinations of the prior art references identified above would have been apparent because these references would have been combined using: known methods to yield predictable results; known techniques in the same way; a simple substitution of one known, equivalent element for another to obtain predictable results; and/or a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Furthermore, the combination of the prior art references identified above would have been obvious because the combination represents the known potential options with a reasonable expectation of success.

Additional evidence that there would have been a motivation to combine the prior art references identified above includes the interrelated teachings of multiple prior art references; the effects of demands known to the design community or present in the marketplace; the existence of

a known problem for which there was an obvious solution encompassed by the asserted claim; the existence of a known need or problem in the field of endeavor at the time of the invention(s); and the background knowledge that would have been possessed by a person having ordinary skill in the art.

Thus, the motivation to combine the teachings of the prior art references disclosed herein is found in the references themselves and: (1) the nature of the problem being solved; (2) the express, implied and inherent teachings of the prior art; (3) the knowledge of persons of ordinary skill in the art; (4) the predictable results obtained in combining the different elements of the prior art; (5) the predictable results obtained in simple substitution of one known element for another; (6) the use of a known technique to improve similar devices, methods, or products in the same way; (7) the predictable results obtained in applying a known technique to a known device, method, or product ready for improvement; (8) the finite number of identified predictable solutions that had a reasonable expectation of success; and (9) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces.

Accordingly, the teaching, suggestion, or motivation to modify or combine the references in the manner claimed can be found in the explicit and/or implicit teachings of the references and the prior art as a whole, the general knowledge of those skilled in the art, including knowledge of trends in the field, and knowledge that the art is of special interest or importance in the field. One of ordinary skill in the art would have been motivated by such obvious considerations as enhancing the control and operation of bi-directional transmissions over two-wire interfaces at the claimed time of invention. One of ordinary skill in the art would have been motivated by additional obvious considerations such as enhancing the compatibility of a sink and a source with current standards.

See e.g., McLeod at 1:7-9; *see also id.* at 4:34-36 ("Also, the current revision of the USB Specification requires compatibility between hosts and devices which were manufactured in accordance with the different USB Specification Revisions.") One of ordinary skill in the art would additionally have been motivated by additional obvious considerations including increasing wire length between a source and a sink. *See e.g.,* McLeod at 2:12-13 ("There is therefore a need for methods and apparatus to allow USB devices to be positioned at greater distances from the host PC.") Another obvious consideration that would motivate a POSITA is improving performance of a bi-directional transmission interface. *See e.g.*, Asseline at [0023] ("There is, therefore, a need for a method to improve the communication performance between PCI protocol units and IB protocol units when bridge units are available and to improve performance when bridge units are not available.") An additional obvious consideration that would have motivated a POSITA is maintaining data Integrity. *See e.g.*, Delmonico at 1:34-36 ("Accordingly, there is a need for an I2C-type bus that practically supports a greater number of addresses while also providing an amount of integrity for data traveling thereon.") Stated differently, the references above demonstrate that there was, at the time of the alleged invention, a finite number of identified, predictable solutions for enhancing the control and operation of audio-video data transmission and reception that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious.

Much of the art identified above and in the attached Exhibits reflects common knowledge and the state of the art prior to the filing date of the '282 Patent and/or at the time the alleged invention was made. In many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts

attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations.

Below, HP has provided several additional examples of the motivations that a POSITA would have had to combine certain of the prior art references in Exhibits 282-A through 282-O. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. Instead, in many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined.

As an example, a POSITA would have been motivated to combine Asseline, Mcleod, Brock, Narjes, Ko, Delmonico, Zhao, Pierce, Caldwell, Philips I^2C Bus Interface Systems, Kejser, Ben-Dor, Bingham, RS-485 Adapter, and/or Thorton ("'282-Primary References") with each other. A POSITA would have been motivated to combine these references because they all disclose features of and/or are applicable to bi-directional transmission of data of data over a two-wire interface. *See* Exs. 282-A through 282-P at claim element [1(pre)]. A POSITA would recognize that the 282-Primary References include features applicable to the same or similar type of transmitters and/ or receivers, and accordingly would have been motivated to combine those references to improve the usability and reliability of the ensuing bi-directional data transmissions. A POSITA would have a reasonable expectation of success with combining these references because they describe features of the same underlying bi-directional data transmissions.

As a further example, a POSITA would be motivated to combine one or more of the 282-Primary References with one or more of Senthil, Ewedemi, Kimura, Bailey, Il, I^2C Specification 2000, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, Bunton, Riley, Moelands, and/or Schutte ("282-Secondary References"). A POSITA would have been motivated to combine these references because 282-Secondary References describe features of and/or are applicable to the disclosure of re-mapping a data signal and a clock signal from a first local bus on the source into a different protocol signal by the 282-Primary References. *See* Exs. 282-A through 282-O at claim element [1(a)]. A POSITA would have recognized that re-mapping a data signal and a clock signal from a first local bus on the source into a different protocol signal would be useful for bi-directional transmission of data, and accordingly would have been motivated to combine these references to order to improve the transmission of the encoded data. A POSITA would have had a reasonable expectation of success with combining these references because re-mapping signals into other protocols was a well-known technique which a person of ordinary skill knew could provide for compatibility with current standards, increased wire lengths, improved transmission performance, and/ or maintaining integrity of transmitted data.

As a further example, a POSITA would have been motivated to combine one or more of the 282-Primary References with one or more of the 282-Secondary References because the 282-Secondary References describe features of and/or are applicable to the disclosure of transmitting a different protocol signal from a source to a sink by the 282-Primary References. *See* Exs. 282-A through 282-O at claim element [1(b)]. A POSITA would have recognized that transmitting a different protocol signal from the source to the sink would be useful for bi-directional transmission of data, and accordingly would be motivated to combine these references to order to improve the transmission of the encoded data. A POSITA would have had a reasonable expectation of success

with combining these references because transmitting a re-mapped signal was a well-known technique which a person of ordinary skill knew could provide for compatibility with current standards, increased wire lengths, improved transmission performance, and/ or maintaining integrity of transmitted data.

As a further example, a POSITA would have been motivated to combine the 282-Primary References with Il, I^2C Specification 2000, IEEE-1394 Specification, USB-2.0 Specification, PCI-2.1, Riley, Bunton, Schutte, and/or Moelands. A POSITA would have been motivated to combine these references because these references describe features of and/or is applicable to the disclosure of re-mapping the different protocol signal back into the data signal and the clock signal for use on a second local bus on the sink by the 282-Primary References. *See* Exs. 282-A through 282-O at claim element [1(c)]. A POSITA would have recognized that re-mapping a transmitted signal back into the data signal and clock signal would be useful for bi-directional transmission of data, and accordingly would have been motivated to combine these references to order to improve the transmission of the encoded data. A POSITA would have had a reasonable expectation of success with combining these references because re-mapping a transmitted signal back to their original protocol was a well-known technique which a person of ordinary skill knew could provide for compatibility with current standards, increased wire lengths, improved transmission performance, and/ or maintaining integrity of transmitted data.

As a further example, a POSITA would have been motivated to combine the 282-Primary References with each other and/or with I^2C-2.1, Moelands, Schutte, RFC-862, IEEE-1394 Specification, USB-2.0 Specification, PCI v2.1, and/or Riley. A POSITA would be motivated to combine these references because they describe features of and/or are applicable to the disclosure of re-mapping the data signal and the clock signal from the second local bus into the different

protocol signal. *See* Exs. 282-A through 282-P at claim element [1(d)]. A POSITA would have recognized that re-mapping the data signal and the clock signal from the second local bus into the different protocol signal would be useful for bi-directional transmission of data, and accordingly would be motivated to combine these references to order to improve the transmission of the encoded data. A POSITA would have had a reasonable expectation of success with combining these references because re-mapping the data signal and the clock signal from sink into the different protocol signal was a well-known technique which a person of ordinary skill knew could provide for compatibility with current standards, increased wire lengths, improved transmission performance, and/ or maintaining integrity of transmitted data.

As a further example, a POSITA would have been motivated to combine the 282-Primary References with Ewedemi, Bailey, RFC-862, and/or Bunton. A POSITA would be motivated to combine these references because these references describe features of and/or are applicable to the disclosure of transmitting the different protocol signal from the sink to the source over the two-wire interface by the 282-Primary References. *See* Exs. 282-A through 282-O at claim element [1(e)]. A POSITA would recognize that transmitting the different protocol signal from the sink to the source over the two-wire interface would be useful for bi-directional transmission of data, and accordingly would be motivated to combine these references to order to improve the transmission of the encoded data. A POSITA would have had a reasonable expectation of success with combining these references because the bi-directional transmission of a common protocol was a well-known technique which a person of ordinary skill knew could provide for compatibility with current standards, increased wire lengths, improved transmission performance, and/ or maintaining integrity of transmitted data.

As a further example, a POSITA would have been motivated to combine Zhao, Schutte, and RFC-862. A POSITA would have been motivated to combine Zhao and Schutte because Zhao discloses re-mapping between I^2C signal and a different protocol signal. Schutte provides more details of I^2C signal. Therefore, a POSITA would have been motivated to implement Zhao's teaching of I^2C signal with the details provided by Schutte. In addition, RFC-862 discloses sending the received data back to the originating source for debugging. A POSITA would have found it obvious to incorporating RFC-862's teaching in Zhao's system to ensure the system is reliable as Zhao desires. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine Ben-Dor, RFC-862, and optionally IEEE-1394 Specification and/or USB-2.0 Specification. A POSITA would have been motivated to combine Ben-Dor, IEEE-1394 Specification, and/or USB-2.0 Specification with each other because Ben-Dor discloses re-mapping between IEEE 1394 protocol (or USB protocol) and a different protocol signal. IEEE-1394 Specification and USB-2.0 Specification provides more details of the format of IEEE 1394 protocol (or USB protocol). Therefore, A POSITA would have been motivated to implement Ben-Dor's teaching of IEEE 1394 protocol (or USB protocol) with the details provided by IEEE-1394 Specification (or USB-2.0 Specification). In addition, RFC-862 discloses sending the received data back to the originating source for debugging. A POSITA would have found it obvious to incorporating RFC-862's teaching in Ben-Dor's system to ensure the system is reliable as Ben-Dor desires. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to

transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine Caldwell, Schutte, and RFC-862. A POSITA would have been motivated to combine Caldwell and Schutte because Caldwell discloses re-mapping between any communication protocol signal and a different protocol signal. Schutte provides more details of the I^2C protocol signal. Therefore, a POSITA would have been motivated to implement Caldwell's teaching of re-mapping any communication protocol with the details provided by Schutte. In addition, RFC-862 discloses sending the received data back to the originating source for debugging. A POSITA would have found it obvious to incorporating RFC-862's teaching in Caldwell's system to ensure the system is reliable as Caldwell desires. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine Thorton, USB-2.0 Specification and RFC-862. A POSITA would have been motivated to combine Thorton and USB-2.0 Specification because Thorton discloses re-mapping between USB protocol and a different protocol signal. USB-2.0 Specification provides more details of the USB protocol. Therefore, a POSITA would have been motivated to implement Thorton's teaching of USB protocol with the details provided by USB-2.0 Specification. In addition, RFC-862 discloses sending the received data back to the originating source for debugging. A POSITA would have found it obvious to incorporating RFC-862's teaching in Thorton's system to ensure the system is reliable as Thorton desires. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface

and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine Asseline, Riley, Bunton and RFC-862. A POSITA would have been motivated to combine Asseline with Riley and Bunton because Asseline discloses re-mapping between PCI protocol and IB protocol signal. Riley provides more details of the PCI protocol while Buton provides more details of the IB protocol. Therefore, a POSITA would have been motivated to implement Asselien's teaching of PCI and IB protocols with the details provided by Riley and Bunton. In addition, RFC-862 discloses sending the received data back to the originating source for debugging. A POSITA would have found it obvious to incorporating RFC-862's teaching in Asseline's system to ensure the system is reliable as Asseline desires. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine Kejser, USB-2.0 Specification and RFC-862. A POSITA would have been motivated to combine Kejser and USB-2.0 Specification because Kejser discloses re-mapping between USB protocol and Fiber Optical protocol signal. USB-2.0 Specification provides more details of the USB protocol. Therefore, a POSITA would have been motivated to implement Kejser's teaching of USB protocol with the details provided by USB-2.0 Specification. In addition, RFC-862 discloses sending the received data back to the originating source for debugging. A POSITA would have found it obvious to incorporating RFC-862's teaching in Kejser's system to ensure the system is reliable as Kejser desires. A POSITA would have had a reasonable expectation of success combining these references

because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine Bingham and any of Zhao, Schutte, Caldwell, Moelands, Thornton, Ben-Dor, Senthil, or I2C – RS-485 adapter. A POSITA would have been motivated to combine Bingham and any of these references because they all disclose bi-directional communication over two-wire between a source and a sink. Therefore, a POSITA would have been motivated to implement Bingham's system with the details of the source and sink devices provided by any of these references. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

C. The '437 Patent

Plaintiff alleges that HP infringes claim 41 of the '437 Patent, but this claim ("the Asserted Claim of the '437 Patent") is invalid.

1. Identification of Prior Art: P.R. 3-3(a)

Pursuant to Patent Rule 3-3 and subject to HP's reservations of rights in these Invalidity Contentions, at least the prior art listed below, individually or in combination, invalidates the Asserted Claim of the '437 Patent. Exhibits 437-A through 437-K provide detailed claim charts showing where each claim limitation may be found in certain references listed below, either expressly or inherently as the reference would be understood by a person having ordinary skill in the art. For those references for which detailed claim charts are not provided in Exhibits 437-A through 437-K, those additional prior art references are otherwise pertinent to the invalidity of the '437 Patent, either alone or in combination with other references.

The prior art references, systems, and products listed below and in the accompanying claim chart exhibits may be relied upon for certain limitations, state of the art, and background of the art; indicia of obviousness; as evidence of the level of skill in the art at the time of the filing of the Patents-in-Suit; and/or in support of assertions that it is proper to combine certain prior art references in certain ways.

Defendant also incorporates by reference each and every prior art reference of record in the prosecution of the Patents-in-Suit and patents or patent applications related to the Patents-in-Suit, the prior art referred to in the specifications of the Patents-in-Suit, as well as the prior art identified in any USPTO proceedings involving any of the Patents-in-Suit.

a. Prior Art Patents, Patent Applications, and Patent Publications

The following patents, patent applications, and patent application publications are prior art under 35 U.S.C. §§ 102(a), (b), and/or (e).[5]

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	4,486,739	June 30, 1982	Dec. 4, 1984	Franaszek
US	4,665,517	Dec. 30, 1983	May 12, 1987	Widmer ’517
US	4,780,758	Feb. 24, 1988	Oct. 25, 1988	Lin
US	4,864,303	Feb. 13, 1987	Sept. 5, 1989	Ofek ’303
US	5,025,256	Apr. 17, 1990	June 18, 1991	Stevens
US	5,241,382	Apr. 25, 1992	Aug. 31, 1993	Paik
US	5,260,703	Aug. 27, 1992	Nov. 9, 1993	Nguyen
US	5,285,276	May 25, 1993	Feb. 8, 1994	Citta
US	5,319,453	June 22, 1989	June 7, 1994	Copriviza
US	5,561,468	Feb. 28, 1995	Oct. 1, 1996	Bryan
US	5,570,132	June 6, 1994	Oct. 29, 1996	De With
US	5,625,644	Dec. 20, 1991	Apr. 29, 1997	Myers
US	5,784,010	Feb. 3, 1997	July 21, 1998	Coker
US	5,805,762	Apr. 18, 1994	Sept. 8, 1998	Boyce

[5] Under the America Invents Act (“AIA”), invalidating prior art is defined in 35 U.S.C. § 102(a). However, AIA Section 102(a) was not effective until March 17, 2013. The ’437 Patent purports to predate March 17, 2013, and therefore pre-AIA Section 102 (including sub-sections 102(a), (b), (e) and (g)) apply to the prior art identified in these Invalidity Contentions and the attached exhibits.

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	5,809,075	Apr. 11, 1997	Sept. 15, 1998	Townshend
US	5,835,498	June 14, 1996	Nov. 10, 1998	Kim
US	5,878,061	Oct. 10, 1997	Mar. 2, 1999	Hauck
US	5,907,566	May 29, 1997	May 25, 1999	Benson
US	5,974,464	Sept. 30, 1996	Oct. 26, 1999	Shin
US	5,999,571	Oct. 5, 1995	Dec. 7, 1999	Shin
US	6,005,861	Mar. 3, 1999	Dec. 21, 1999	Humpleman
US	6,054,944	July 22, 1998	Aug. 25, 2000	Yamashita ’944
US	6,108,390	Aug. 21, 1997	Aug. 22, 2000	Bell
US	6,148,428	May 21, 1998	Nov. 14, 2000	Welch
US	6,151,334	Nov. 4, 1998	Nov. 21, 2000	Kim
US	6,188,335	Aug. 19, 1998	Feb. 13, 2001	Roth
US	6,188,987	Nov. 17, 1998	Feb. 13, 2001	Fielder
US	6,195,128	Feb. 23, 1998	Feb. 27, 2001	Streater
US	6,272,131	July 22, 1998	Aug. 7, 2001	Ofek ’131
US	6,353,912	Nov. 17, 1998	Mar. 5, 2002	Uchida
US	6,362,757	Dec. 29, 1999	Mar. 26, 2002	Lee ’757
US	6,404,898	June 24, 1999	June 11, 2002	Rhoads
US	6,564,269	Sept. 8, 1999	May 13, 2003	Martin
US	6,675,388	Jan. 29, 1999	Jan. 6, 2004	Beckmann
US	6,870,930	May 26, 2000	Mar. 22, 2005	Kim
US	6,903,780	Sept. 28, 2001	Dec. 12, 2002	Mair
US	7,146,506	May 25, 1999	Dec. 5, 2006	Hannah
US	7,161,998	July 26, 2001	Sept. 5, 2002	Bodenschatz
US	7,356,051	Sept. 12, 2001	Apr. 8, 2008	Pasqualino ’051
US	6,754,240	July 14, 1999	June 22, 2004	Crummey
US	2001/0019560	Jan. 4, 2001	Sept. 6, 2001	Yamashita
US	2001/0012365	Feb. 9, 2001	Aug. 9, 2001	Gaedke
US	2002/0097869	Sept. 12, 2001	July 25, 2002	Pasqualino ’869
US	2002/0118762	May 8, 2001	Aug. 29, 2002	Shakiba
US	2002/0126684	Mar. 20, 2002	Sep. 12, 2002	Findlater
US	2002/0163598	Jan. 23, 2002	Nov. 7, 2002	Pasqualino
US	2003/0118196	Dec. 21, 2001	June 26, 2003	Woolfork
US	2003/0001981	Mar. 28, 2002	Jan. 2, 2003	Milne
US	2003/0020983	Feb. 28, 2001	Jan. 30, 2003	Cai
DE	19647453A1	Nov. 16, 1996	May 20. 1998	Loew
EP	0895420A2	July 31, 1998	Feb. 3, 1999	Yamada
EP	0981220A2	June 18, 1999	Feb. 23, 2000	Pehkonen
EP	0147677B1	Dec. 4, 1984	Mar. 8, 1989	Widmer
EP	1303145A1	July 23, 2001	Apr. 16, 2003	Suzuki
EP	1360769A1	Feb. 2, 2001	Nov. 12, 2003	Immink
EP	1366626B1	Sept. 20, 2001	June 14, 2006	Katayama
EP	1381235A1	Mar. 25, 2002	Jan. 14, 2004	Okamoto

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
EP	2533532A1	Jan. 29, 2002	Dec. 12, 2012	Ejima
EP	2265011A1	Mar. 7, 2002	Dec. 22, 2010	Okamoto
GB	2339655A	July 14, 1998	Feb. 2, 2000	Crummey
JP	3965047B2	Dec. 17, 2001	Aug. 22, 2007	Matsuzaki
WO	99/31888	Dec. 11, 1998	June 24, 1999	Miwa

b. Non-Patent Publications

The following non-patent publications are prior art under 35 U.S.C. §§ 102(a) and/or (b).

Title	Author/Publisher	Date of Publication
European Standard EN 50083-9, entitled "Cable networks for television signals, sound signals and interactive services Part 9: Interfaces for CATV/SMATV headends and similar professional equipment for DVB/MPEG-2 transport streams" ("DVB 50083-9")	European Committee for Electrotechnical Standardization	June 1998
DVB FEC Codec, ALTERA (Feb. 29, 2000) ("DVB FEC")	Altera	Feb. 29, 2000
EN ISO/IEC 13818-1, entitled "Information technology – Generic coding of moving pictures and associated audio information" ("EN ISO/IEC 13818-1")	International Telecommunication Union	July 10, 1995
ETS 300 429, entitled "Digital Broadcasting for television, sound, and data services – Framing Structure, channel coding and modulation for cable systems" ("ETS 300 429")	European Telecommunication Standards Institute	Dec. 1994
ETS 400 468, entitled "Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems"	European Teleconomic	Jan. 1997
Digital Visual Interface DVI	Digital Display Working Group	Apr. 2, 1999
Altera Ships Mercury™ Device Family - The World's First Programmable	Altera	Feb. 19, 2001

Title	Author/Publisher	Date of Publication
ASSP, ALTERA (Feb. 19, 2001) ("Mercury Shipment")		
Altera Ships 10,000-Gate FLEX 10K Device, ALTERA (Mar. 25, 1996) ("FLEX 10K Shipment")	Altera	Mar. 25, 1996
Altera Ships APEX EP20K100 for High Performance System-on-a-Programmable-Chip Designs, ALTERA (June 14, 1999) ("APEX 20K Shipment")	Altera	June 14, 1999
Application Note 130 – CDR In Mercury Devices, ALTERA (Feb., 2001) ("AN130")	Altera	Feb. 2001
Mercury Advanced CDR Support, ALTERA (Apr. 7, 2001) ("Mercury CDR")	Altera	Apr. 7, 2001
M1GXCVR MegaCore Function, ALTERA (Jun. 8, 2001) ("M1GXCVR")	Altera	June 8, 2001
Mercury Gigabit Transceiver MegaCore Function (M1GXCVR) Data Sheet, ALTERA (Apr., 2001) ("M1GXCVR Data Sheet")	Altera	Apr. 2001
Reed-Solomon Compiler MegaCore Function User Guide November 1999, ALTERA (Nov., 1999) ("Reed-Solomon User Guide")	Altera	Nov. 1999
Mercury Programmable Logic Device Family Data Sheet, ALTERA (Oct. 2001) ("Mercury Data Sheet")	Altera	Oct. 2001

Title	Author/Publisher	Date of Publication
Customer Success Stories, ALTERA (Apr. 5, 2001) ("Customer Success Stories")	Altera	Apr. 5, 2001
Mercury The Programmable ASSP, ALTERA (May, 2001) ("Mercury ASSP")	Altera	May 2001
HammerCores by Altera, 8b/10b Encoders White Paper, ALTERA (Jan. 2000) ("8b/10b Encoders White Paper")	Altera	Jan. 2000
8b10b Encoder/Decoder MegaCore Function (ED8B10B) Data Sheet, ALTERA (Nov., 2001) ("ED8B10B")	Altera	Nov. 2001
IEEE Standard 802.3, entitled "Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications" ("IEEE Standard 802.3")	IEEE Computer Society	June 1998
QuickTime 4 Moves Upstream, MACWORLD (Jun. 30, 1999) ("Quicktime")	Macworld	June 30, 1999
Digital Visual Interface DVI Specification ("DVI")	Digital Display Working Group	Apr. 2, 1999
Intel 810E Chipset: 82810E Graphics and Memory Controller Hub (GMCH) Datasheet ("810E Datasheet")	Intel	Sept. 2000

Title	Author/Publisher	Date of Publication
Intel 810 Chipset Product Brief ("810 Product Brief")	Intel	2000
Intel 810 Chipset Design Guide ("810 Design Guide")	Intel	June 1999
SMPTE Recommended Practice Bit-Parallel Digitial Interface for 4:4:4:4 Component Video Signal (Single Link)	Society of Motion Picture and Television Engineers	1993
SMPTE Standard for Television ---- 1125/60 High-Definition Production System — Digital Representation and Bit-Parallel Interface, SMPTE 260M-1999 ("SMPTE 260M")	Society of Motion Picture and Television Engineers	Jan. 4, 1999
SMPTE Standard for Television ---- Bit-Serial Digital Interface for High-Definition Television Systems, SMPTE 292M-1998, by SMPTE ("SMPTE 292M")	Society of Motion Picture and Television Engineers	Oct. 1, 1998
SMPTE Standard for Television ---- Ancillary Data Packet and Space Formatting, SMPTE 291M-1998 ("SMPTE 291M")	Society of Motion Picture and Television Engineers	Oct. 1, 1998
Sony HD Color Video Camera HDC-700 Operation Manual, 1st Edition (Revised 1) ("HDC-700 Op Manual")	Sony	Sept. 13, 1997
Sony High Definition Video System Digital HDVS Sony Multi-format Video Camera System HDC-900/HDC-950/HDCU-900	Sony	2001
American National Standard Institute ANSI INCITS 230-1994 (R1999),	American National Standards Institute	Nov. 14, 1994

Title	Author/Publisher	Date of Publication
entitled Fiber Channel – Physical Signaling Interface (FC-PH) ("ANSI 230-1994")		
A DC-Balanced, Partitioned-Block, 8B/10B Transmission Code, 27 IBM J. OF RES. AND DEVELOP. 5, 440 ("Widmer")	IBM	Sept. 1983
Cypress CY7B923/CY7B933 HOTLink Transmitter/Receiver ("Cypress HOTLink")	Cypress Semiconductor Corporation	Aug. 14, 1997
American National Standard Institute ANSI T1X1.5/2000-024R3, entitled *Generic Framing Procedure*	American National Standards Institute	May 2001
Directorate of Distance Education B.Sc (Computer Science) 130 61 – Computer Networks	Alagappa University	
CIT 754: Network Programming and Design	National Open University of Nigeria; I-leinenmann Educational Books (Nigeria)	2004
Kenwood Service Manual UHF Repeater NXR-1800	JVCKENWOOD Corp.	2023
A Broadcast Engineering Tutorial for Non Engineers 2nd Editions	National Association of Broadcasters	Apr. 1999
Lecture Notes for TH-1, Advance Communication Engg.	Ray; SKDAV Gov't Polytechnic Rourkela	
Measurements in digital component television studios	European Broadcasting Union	Dec. 1996
SMPTE Recommended Practice Bit-Parallel Digitial Interface for 4:4:4:4 Component Video Signal (Single Link)	Society of Motion Picture and Television Engineers	1993
Line Coding for Very High Speed LANs	Munoz-Rodriguez et al.; Electronic Letters	Nov. 22, 1990
Systran A-H-PR-BFMCBF2-#-0-B2 FibreXpress PMC Module	Artisan Technology Group	1996

Title	Author/Publisher	Date of Publication
Catalyst 2900 Series XL Expansion Modules Data Sheet	Cisco Systems	June 2001
DSP-4000 Series CableAnalyzer Users Manual	Fluke Networks, Inc.	July 2001
Gigabit Ethernet 1000Base-T Whitepaper	Gigabit Ethernet Alliance	1997
Fast Ethernet Switch with Gigabit Uplink Installation Guide Model FS 509T	NetGear Inc.	2001
Serial ATA: High Speed Serialized AT Attachment Revision 1.0	SerialATA Workhgroup; Seagate	Aug. 29, 2001
Comparing Bus Solutions	Alicke et al.; Texas Instruments	Mar. 2000
TLK2201 Ethernet Transceivers	Texas Instruments	June 2000

c. Prior Art Systems

The Asserted Claim of the ’437 Patent is invalid under 35 U.S.C. § 102(a) and (b) because it was known by others, publicly used, and on sale in the United States before it was purportedly invented and more than one year before the priority date of the Asserted Claim. Additionally, the Asserted Claim is invalid under 35 U.S.C. § 102(g) because any purported invention was made in this country by another who had not abandoned, suppressed, or concealed the purported invention. For example, the foregoing patents and publications are evidence of such prior art systems and inventions. Additionally, HP relies on the systems identified in the Exhibits hereto and the systems identified below.

System	Date of Prior Invention, Sale, Use, Or Knowledge
DVB	No later than February 29, 2000
Altera PLDs (Mercury, Flex 10K, and Apex 20K Programmable Logic Device Product Families)	No later than February 19, 2001
SDI Products (Sony HDC-900, Sony HDC-930, Sony HDC-950, Sony HDCU-900, and other products compliant with SDI)	No later than 2000

System	Date of Prior Invention, Sale, Use, Or Knowledge
The Gigabit Ethernet Standard	No later than June 1998
DVI Products (Intel 810 Chipset, Intel 810E Chipset, and other products compliant with DVI)	No later than June 1999

d. Bases for Anticipation and/or Obviousness

Each prior art reference identified in Exhibits 437-A through 437-K expressly, implicitly, or inherently anticipates and/or renders obvious the Asserted Claim of the '437 Patent, either alone or in combination with other prior art references (*e.g.*, the references identified in Exhibits 437-A through 437-K or other references identified above) or the knowledge of the person of ordinary skill in the art at the time of the alleged invention. Each of the prior art references included in Exhibits 437-A through 437-K can be combined with any other prior art reference identified in Exhibits 437-A through 437-K, or identified above, to render obvious the Asserted Claim of the '437 Patent, and the examples of combinations below are intended for emphasis only.[6]

In the table below, HP identifies a non-exhaustive list of prior art references that, alone or in combination, anticipate and/or render obvious the Asserted Claim of the '437 Patent. Any prior art not identified, or any prior art combination not expressly identified in the table below in no way limits the combinations of references that would have naturally been considered as part of the exercise of ordinary skill by one skilled in the art.

[6] For example, each of Kim (optionally in view of Shin), Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, SDI Products, Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, and DVI Products may be combined with each other to render obvious the Asserted Claim of the '437 Patent.

Exhibit	Reference(s)
437-A	Kim either alone or in combination with one or more of Shin, Yamashita, Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, and Widmer '517
437-B	Yamashita either alone or in combination with one or more of Kim, Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, and Widmer '517
437-C	DVB-50083-9 or DVB either alone or in combination with one or more of Yamashita, Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, and Widmer '517
437-D	Pasqualino '051 either alone or in combination with one or more of Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, Widmer '517, DVI or DVI Products, Yamashita, and Pasqualino '869
437-E	Pasqualino '869 either alone or in combination with one or more of Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, Widmer '517, DVI or DVI Products, Yamashita, and Pasqualino '869
437-F	SMPTE 291M, SMPTE 292M, SMPTE 260M, and/or SDI Products, either alone or in combination with one or more of Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, Widmer '517, and Yamashita
437-G	Altera PLDs either alone or in combination with one or more of Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, Widmer '517, Yamashita '560, SMPTE 291M, SMPTE 292M, SMPTE 260M, SDI Products, DVB-50083-9 or DVB, and IEEE Standard 802.3 or the Gigabit Ethernet Standard
437-H	IEEE Standard 802.3 or the Gigabit Ethernet Standard either alone or in combination with one or more of Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Humpleman, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, Widmer '517, and Yamashita

Exhibit	Reference(s)
437-I	DVI or DVI Products either alone or in combination with one or more of Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Shin, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch, Widmer '517, Yamashita, Pasqualino '051, and Pasqualino '869
437-J	Widmer '517 either alone or in combination with one more of Kim, Shin, Yamashita, Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, and Welch
437-K	Crummey either alone or in combination with one more of Kim, Shin, Yamashita, Myers, Uchida, Stevens, ANSI 230-1994, Franaszek, Widmer, Paik, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Bodenschatz, Mair, Ofek, Bryan, Townshend, Welch and Widmer '517

The accompanying claim charts (Exhibits 437-A through 437-K) set forth example bases for anticipation and obviousness, identifying where each reference discloses, alone or in combination with other references, each limitation of the Asserted Claim of the '437 Patent on a limitation-by-limitation basis. HP's claim charts are exemplary and not exhaustive.

e. Obviousness Combinations

Subject to HP's reservation of rights, HP contends that all of the prior art references, as identified above and described in the charts attached as Exhibits 437-A through 437-K, by themselves anticipate the Asserted Claim of the '437 Patent in accordance with 35 U.S.C. § 102 and/or render the Asserted Claim of the '437 Patent obvious under 35 U.S.C. § 103, as more specifically noted in the attached charts.

The cited portions of the prior art references are examples and representative of the content of the prior art references, and should be understood in the context of the reference as a whole, as understood by one of ordinary skill in the art. To the extent a cited prior art reference is deemed not to anticipate or render obvious a claim as noted in the attached charts for failing to teach or suggest one or more limitations of that claim, that claim would nonetheless have been obvious to

one of ordinary skill in the art at the time of the invention by the combination of the cited prior art reference with one or more other prior art references and/or common knowledge disclosing the missing claim limitations. For example, any of the references listed above, to the extent it does not explicitly or inherently disclose any limitation, could be combined with any one or more of the other references listed above which discloses that limitation.

HP reserves the right to supplement the obviousness arguments using any references listed above, or any references that may become known to HP during the course of discovery. Further, the suggested obviousness combinations are in addition to HP's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not anticipatory on its own.

f. Motivation to Combine and Reasonable Expectation of Success

With respect to the '437 Patent, the prior art identified above non-exhaustively illustrates the scope and content of the prior art. As detailed in claim charts 437-A through 437-K, the prior art included each limitation recited in the Asserted Claim of the '437 Patent. To the extent a cited prior art reference is deemed not to anticipate a claim, the only difference between the claimed invention and the prior art is the lack of actual combination of the elements in a single prior art reference. However, for at least the reasons discussed above and the additional reasons discussed below, a POSITA would have been motivated to combine each of the above prior art references. A POSITA in the art pertaining to the Asserted Patents at the relevant time would have been someone with a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent training, as well as at least two years of experience working in the field of digital transmissions. A more advanced degree would require less work experience.

A POSITA would have numerous motivations to combine each of the above-referenced prior art. For example, as the United States Supreme Court held in *KSR*, "[t]he combination of

familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." 550 U.S. at 416. The Supreme Court further held that, "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . ." *Id.* at 417. Accordingly, a person of skill in the art would have been motivated to combine or adapt known or familiar methods in the art.

The combinations of the prior art references identified above would have been obvious in view of: (1) the knowledge of persons of ordinary skill in the art; (2) the express, implied and inherent teachings of the prior art, or the interrelated teachings of multiple prior art references; (3) the nature of the problem being solved; (4) the fact that they are combinations of known methods to yield predictable results; (5) the fact that they involve a simple substitution of one known, equivalent element for another to obtain predictable results; (6) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces; (7) the existence of a known need or problem in the field of endeavor at the time of the invention(s); and/or (8) a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Furthermore, the combination of

the prior art references identified above would have been obvious because the combination represents the known potential options with a reasonable expectation of success.

Indeed, to the extent the prior art references identified herein do not anticipate the Asserted Claim, the limitations of the Asserted Claim are merely obvious variations of the systems and methods disclosed in the various prior art references. As discussed below and in the prior art references identified in Exhibits 437-A through 437-K, the Asserted Claim includes only well-known, conventional technologies prior to the '437 Patent. The prior art identified herein and in Exhibits 437-A through 437-K reflects the common knowledge and state of the art prior to the Asserted Patents. The '437 Patent does not purport to have invented any of these technologies; rather, the '437 Patent simply tacked on these conventional prior art approaches to conventional and generic known prior techniques. As such, the Asserted Claim of the '437 Patent merely incorporates the knowledge of a POSITA. The mere amalgamation of such conventional technologies here is not inventive—it is simply combining or substituting well-known, conventional prior art elements according to known methods to yield predictable results.

For example, a person having ordinary skill in the art would have been motivated to combine the prior art identified in in Exhibits 437-A through 437-K, and would have held a reasonable expectation of success in doing so, based on the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons having ordinary skill in the art. Each reference in Exhibits 437-A through 437-K discloses methods and systems for transmission of data, including but not limited to video data, over a serial link. The references identified in Exhibits 437-A through 437-K are analogous prior art to the subject matter of the Asserted Claims and are proper to combine. Because these prior art references exist within a single field of art—such as, for example, serial data transmission—particularly one in which individuals in the field often

shared and/or collaborated on their work—for example, given the standardization of various transmission mechanisms in the industry—it would have been obvious for a POSITA to look from one piece of prior art to another to find any missing functionality they desired to implement, or to replace functionality in one prior art reference for that described in another reference. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the '437 patent.

Combining the prior art references identified herein and in Exhibits 437-A through 437-K, which address similar problems as explained above, would have been obvious and straightforward to a POSITA. *First*, the combinations represent no more than the use of known techniques according to known methods in the same ways to yield predictable results. For example, the references generally address the same field of serial data transmission, and a POSITA would be motivated by such obvious considerations as enhancing the reliability and operation of serial data transmissions at the claimed time of invention. *Second*, the references themselves identify the known problems and provide known solutions to address those problems in the field. Indeed, the references identified herein and in Exhibits 437-A through 437-K demonstrate that there was, at the time of the alleged invention, a finite number of identified, predictable solutions for enhancing the reliability and operation of serial data transmissions that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious. *Third*, a POSITA would appreciate that the combinations improve the systems in the prior art to transmit serial data, including by using conventional encoding techniques, providing more robust encoding techniques, providing subset selection rules, defining control words and their encoding, and/or describing transmission sequences for the serial link. *Fourth*, because the problems and solutions

were known in the field, the particular arrangements and combinations of references would yield predictable results. *Fifth*, a number of the references themselves provide express motivations that would have led a person of ordinary skill to their combination. For example, the references acknowledge that preserving data, reducing interference and errors, and transmission sequencing can be important.

Below, HP has provided several additional examples of the motivations that a POSITA would have had to combine certain of the prior art references in Exhibits 437-A through 437-K. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. Instead, in many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined.

As one example, methods of encoding data for transmission were well-known and within the skill of POSITAs at the time of the alleged invention. *See, e.g.*, Stevens, Widmer, Paik, Uchida, ANSI-230-1994, Franzaszek, Shin, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Mair, Bodenschatz, Ofek, Bryan, Townshend, Widmer ’517, and Welch. The ’437 patent itself concedes that transition minimized differential signaling (“TMDS”) and other “TMDS-like” techniques, including 8b/10b encoding, were “conventional” and well known. *See* ’437 patent, 1:29-33, 4:50-63. These encoding methods, including at least 8b/10b, are disclosed by at least Stevens, Widmer, Paik, Uchida, ANSI-230-1994, Franzaszek, Shin, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Hannah, Pehkonen, Mair, Bodenschatz, Ofek, Bryan, Townshend, Widmer ’517, and Welch. *See, e.g.*, Exs. 437-A through 437-K, at claim elements

[41(a)]. A POSITA would have been motivated to combine these encoding techniques with references disclosing transmission sequences because encoding the data can help improve data integrity and reduce errors in the corresponding transmission. A POSITA would have a reasonable expectation of success with combining these references because the encoding of data for transmission is a well-known frequently-used concept that is widely implemented in the prior art.

As a further example, methods of more robustly encoding data to reduce errors and interference were well-known and within the skills of POSITAs at the time of the alleged invention. *See, e.g.*, Stevens, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, Widmer '517, and Townshend. The '437 patent itself recognizes that it was known that "error rate can be unacceptably high for auxiliary data (especially when the auxiliary data are audio data)," and thus that it would be obvious to apply certain encoding methods to these data types which would reduce those errors to an acceptable level. '437 patent, 12:65-67; *id.*, 12:32-38. These methods could include robust encoding techniques, as disclosed by at least Stevens, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, Widmer '517, and Townshend. *See, e.g.*, Exs. 437-A through 437-K, at claim elements [41(b)]. A POSITA would have been motivated to combine these robust encoding techniques with references disclosing other conventional encoding techniques because certain data types could further benefit from more robust encoding that results in less errors in the transmission. A POSITA would have a reasonable expectation of success with combining these references because the robust encoding techniques are techniques to further encode the conventionally encoded data and thus were designed to be successfully combined with those conventional techniques.

As a further example, methods of encoding control words by encoding control bits were well known and within the skills of POSITAs at the time of the alleged invention. The '437 patent

itself concedes that in "a conventional system," an "encoder [] generates out-of-band words indicative of the values of [control bits]." '437 patent, 2:54-63, 9:61-62. These well-known methods of encoding control bits were disclosed by at least Stevens, Widmer, Widmer '517, Paik, ANSI 230-1994, Franaszek, Shin, Myers, Loew, ANSI T1X1.5/2000-024R3, Hannah, and Pehkonen. *See, e.g.*, Exs. 437-A through 437-K, at claim elements [41(c)]. A POSITA would have been motivated to combine these control word encoding techniques with references disclosing serial data transmission techniques because encoding control words could allow them to be transmitted serially with other data and simplify the decoding process. A POSITA would have a reasonable expectation of success with combining these references because the references already describe application of similar or the same encoding techniques to other types of data.

As a further example, a POSITA would be motivated to combine Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey with each other. A POSITA would be motivated to combine these references because they all disclose features of and/or are applicable to transmission of data over a serial link. *See* Exs. 437-A through 437-K at claim element [41(pre)]. A POSITA would recognize that Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey include features applicable to the same or similar type of transmitters for transmitting the same or similar data types, and accordingly would be motivated to combine those references to improve the usability and reliability of the ensuing data transmissions. A POSITA would have a reasonable expectation of success with combining these references because they describe features of the same

underlying data transmissions—serial transmissions of data, including video, control, audio, and/or other related data types.

As a further example, a POSITA would be motivated to combine Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey with Stevens, Widmer '517, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, and/or Townshend. A POSITA would be motivated to combine these references because Stevens, Widmer '517, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, and/or Townshend may disclose techniques for a more robust encoding than the conventional techniques described in Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey. A POSITA would recognize that the disclosure of more robust encoding in Stevens, Widmer '517, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, and/or Townshend would be useful in reducing interference, errors, and providing for more robust transmission (especially for certain data types where reducing interference or errors is more important, such as audio data), and accordingly would be motivated to combine Stevens, Widmer '517, Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, and/or Townshend with prior art systems using conventional encoding to improve transmission integrity. A POSITA would have a reasonable expectation of success with combining these references because these robust techniques were well-known encoding techniques which a person of ordinary skill knew could provide for more robust transmission of certain data types, including for example, audio data.

As a further example, a POSITA would be motivated to combine Kim, Yamashita, DVB-50083-9, DVB, Pasqualino ’051, Pasqualino ’869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer ’517, and/or Crummey with Stevens, Widmer, Widmer ’517, Paik, ANSI 230-1994, Franaszek, Shin, Myers, Loew, ANSI T1X1.5/2000-024R3, Hannah, and/or Pehkonen. A POSITA would be motivated to combine these references because Stevens, Widmer, Widmer ’517, Paik, ANSI 230-1994, Franaszek, Shin, Myers, Loew, ANSI T1X1.5/2000-024R3, Hannah, and/or Pehkonen disclose techniques for encoding the control bits disclosed in Kim, Yamashita, DVB-50083-9, DVB, Pasqualino ’051, Pasqualino ’869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer ’517, and/or Crummey. A POSITA would recognize that the disclosure in Stevens, Widmer, Widmer ’517, Paik, ANSI 230-1994, Franaszek, Shin, Myers, Loew, ANSI T1X1.5/2000-024R3, Hannah, and/or Pehkonen of encoding control bits would be useful in encoding the control bits for transmission on the serial stream and could improve the decoding process, and accordingly would be motivated to combine one or more of them with Kim, Yamashita, DVB-50083-9, DVB, Pasqualino ’051, Pasqualino ’869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer ’517, and/or Crummey to facilitate transmission of control information with the serial stream and decoding. A POSITA would have a reasonable expectation of success with combining these references because a person of ordinary skill would recognize that the control information should be encoded so it could be transmitted on the serial link with other data.

As a further example, a POSITA would be motivated to combine Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey with Stevens, Paik, Shin, Myers, Widmer '517, and/or Bodenschatz. A POSITA would be motivated to combine these references because Stevens, Paik, Shin, Myers, Widmer '517, Crummey, and/or Bodenschatz disclose the sequences for transmitting the data which was encoded via the techniques of Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey. A POSITA would recognize that the disclosure(s) in Stevens, Paik, Shin, Myers, Widmer '517, Crummey, and/or Bodenschatz of transmission sequences would be useful in transmitting the encoded data via a serial link, and accordingly would be motivated to combine one or more of them with Kim, Yamashita, DVB-50083-9, DVB, Pasqualino '051, Pasqualino '869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer '517, and/or Crummey to order the transmission of the encoded data. A POSITA would have a reasonable expectation of success with combining these references because these transmission sequences were well-known orderings for transmitting data which a person of ordinary skill knew could be used to sequence the encoded data for transmission, and because there were a finite number of orderings in which transmission could occur.

As a further example, a POSITA would be motivated to combine references related to the same standard with each other. A POSITA would be motivated to combine these references because these references disclose techniques applicable to or implementing the same standard,

including DVI, DVB, SDI, and/or Gigabit Ethernet, and provide techniques which improve upon other implementations of the same or similar standard, such as by improving error detection, robustness, expanding applicability into other types of data transmissions, or further providing implementation details of those standards. A POSITA would have a reasonable expectation of success with combining these references because these techniques relate to the same standard and/or are applicable to standards directed to similar use cases.

As a further example, a POSITA would be motivated to combine the Altera PLDs with one or more of SDI, DVB, and Gigabit Ethernet. A POSITA would be motivated to combine these references because SDI, DVB, Gigabit Ethernet systems implement standards which the Altera PLDs implemented and/or were compatible with. A POSITA would recognize that the Altera PLDs implemented or were compatible with SDI, DVB, and Gigabit Ethernet, and accordingly would be motivated to implement the SDI, DVB, Gigabit Ethernet standards in Altera PLDs to ensure compatibility with those standards. A POSITA would have a reasonable expectation of success with combining these references because the Altera PLDs support using those standards in its system.

As a further example, a POSITA would be motivated to combine both Pasqualino references with DVI. A POSITA would be motivated to combine these references because the Pasqualino references explicitly incorporates by reference the DVI standard and teaches implementations which utilize that standard. A POSITA would have a reasonable expectation of success with combining these references because both Pasqualino references explicitly teaches a POSITA to make that combination.

As a further example, a POSITA would be motivated to combine Kim, DVB, Altera PLDs, Gigabit Ethernet, and/or Yamashita, with ANSI 230-1994, Franaszek, Widmer ’517, and/or

Widmer. A POSITA would be motivated to combine these references because Kim, DVB, Altera PLDs, Gigabit Ethernet, and Yamashita disclose implementations which utilize 8b/10b encoding, while references ANSI 230-1994, Franaszek, Widmer ’517, and Widmer disclose how to implement 8b/10b encoding. A POSITA would recognize that implementation of 8b/10b encoding in Kim, DVB, Altera PLDs, Gigabit Ethernet, and/or Yamashita could be accomplished through the techniques described in ANSI 230-1994, Franaszek, Widmer ’517, and/or Widmer, and accordingly would be motivated to combine them to implement 8b/10b encoding. A POSITA would have a reasonable expectation of success with combining these references because ANSI 230-1994, Franaszek, Widmer ’517, and Widmer teach the details of how to accomplish the 8b/10b encoding already described in Kim, DVB, Altera PLDs, Gigabit Ethernet, and Yamashita.

As a further example, a POSITA would be motivated to combine Pasqualino ’051 with Pasqualino ’869. A POSITA would be motivated to combine these references because they are related works of the same inventor, relating to the same subject matter. A POSITA would have a reasonable expectation of success with combining these references because they describe extremely similar systems, invented around the same timeframe, from the same inventor and are thus compatible with one another.

As a further example, a POSITA would be motivated to combine Kim, Yamashita, DVB-50083-9, DVB, Pasqualino ’051, Pasqualino ’869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer ’517, and/or Crummey with Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, Widmer ’517, and/or Townshend. A POSITA would recognize Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, Widmer ’517, and/or Townshend’s disclosure of potentially more robust encoding would be useful in reducing

interference, errors, and providing for more robust transmission (especially for certain data types where reducing interference or errors is more important, such as audio data (*see, e.g.*, Bryan, 3:5-3:15)), and accordingly would be motivated to combine Myers, Loew, Woolfork, ANSI T1X1.5/2000-024R3, Pehkonen, Ofek, Welch, Widmer ’517, and/or Townshend with Kim, Yamashita, DVB-50083-9, DVB, Pasqualino ’051, Pasqualino ’869, SMPTE 291M, SMPTE 292M, SMPTE 260M, the SDI Products, the Altera PLDs, IEEE Standard 802.3, the Gigabit Ethernet Standard, DVI, the DVI Products, Widmer ’517, and/or Crummey to improve transmission integrity. A POSITA would have a reasonable expectation of success with combining these references because these robust techniques were well-known encoding techniques which a person of ordinary skill knew could provide for more robust transmission of certain data types, including for example, audio data.

As a further example, a POSITA would be motivated to combine the SDI Products or Crummey with ANSI 230-1994, Franaszek, Widmer ’517, and/or Widmer. A POSITA would be motivated to combine these references because the SDI Products and/or Crummey recognize the benefit of DC balancing, and ANSI 230-1994, Franaszek, Widmer ’517, and Widmer disclose 8b/10b encoding techniques which improve DC balancing. A POSITA would recognize that the well-known 8b/10b techniques described in ANSI 230-1994, Franaszek, Widmer ’517, and/or Widmer could solve the DC balance issues of the SDI Products and/or Crummey, and accordingly would be motivated to combine the SDI Products and/or Crummey with ANSI 230-1994, Franaszek, Widmer ’517, and/or Widmer to implement 8b/10b encoding. A POSITA would have a reasonable expectation of success with combining these references because the 8b/10b encoding techniques of ANSI 230-1994, Franaszek, Widmer ’517, and Widmer were designed to be compatible in the use cases described in SDI Products and/or Crummey.

As a further example, a POSITA would be motivated to combine Kim, DVB, Altera PLDs, Gigabit Ethernet, and/or Yamashita with ANSI T1X1.5/2000-024R3. A POSITA would recognize ANSI T1X1.5/2000-024R3's disclosure of 8b/10b encoding techniques would be useful in reducing interference, errors, and providing for more robust transmission (especially for certain data types where reducing interference or errors is more important, such as audio data), and accordingly would be motivated to combine ANSI T1X1.5/2000-024R3 with Kim, DVB, Altera PLDs, Gigabit Ethernet, and/or Yamashita to improve transmission integrity. A POSITA would have a reasonable expectation of success with combining these references because these robust techniques were well-known encoding techniques which a person of ordinary skill knew could provide for more robust transmission of certain data types, including for example, audio data.

As a further example, a POSITA would be motivated to combine IEEE Standard 802.3 and/or the Gigabit Ethernet Standard with Humpleman. A POSITA would be motivated to combine these references because IEEE Standard 802.3 and the Gigabit Ethernet Standard describe transmitting data using the gigabit ethernet standard, and Humpleman describes using ethernet to transmit media such as audio and video, thus enabling the faster transmission of media such as audio and video. A POSITA would have a reasonable expectation of success with combining these references because the gigabit ethernet standard described in IEEE Standard 802.3 and the Gigabit Ethernet Standard are compatible with the disclosures of Humpleman, and the combination(s) would amount to nothing more than combining known methods to yield predictable results.

D. The '010 Patent

Plaintiff alleges that HP infringes claims 1 and 12 of the '010 Patent (collectively, "the Asserted Claims of the '010 Patent"). HP contends that the Asserted Claims of the '010 Patent are invalid.

1. Identification of Prior Art: P.R. 3-3(a)

Pursuant to Patent Rule 3-3 and subject to HP's reservations of rights in these Invalidity Contentions, HP asserts that at least the prior art listed below, individually or in combination, invalidates the Asserted Claims of the '010 Patent. Exhibits 010-A through 010-P provide detailed claim charts showing where each claim limitation may be found in certain references listed below, either expressly or inherently in the larger context of the passage, or inherently as the reference as a whole would be understood by a person having ordinary skill in the art. For those references for which detailed claim charts are not provided in Exhibits 010-A through 010-P, those additional prior art references are otherwise pertinent to the invalidity of the '010 Patent, either alone or in combination with other references. The prior art references, systems, and products listed below and in the accompanying claim chart exhibits may be relied upon for certain limitations, state of the art, and background of the art; indicia of obviousness; as evidence of the level of skill in the art at the time of the filing of the Patents-in-Suit; and/or in support of assertions that it is proper to combine certain prior art references in certain ways.

Defendant also incorporates by reference each and every prior art reference of record in the prosecution of the Patents-in-Suit and patents or patent applications related to the Patents-in-Suit, the prior art referred to in the specifications of the Patents-in-Suit, as well as the prior art identified in any USPTO proceedings involving any of the Patents-in-Suit.

a. Prior Art Patents, Patent Applications, and Patent Publications

The following patents, patent applications, and patent application publications are prior art under 35 U.S.C. §§ 102(a), (b), and/or (e).[7]

[7] Under the America Invents Act ("AIA"), invalidating prior art is defined in 35 U.S.C. § 102(a). However, AIA Section 102(a) was not effective until March 17, 2013. The '010 and '786 Patents purport to predate March 17, 2013, and therefore pre-AIA Section 102 (including sub-sections

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	4,734,756	Dec. 3, 1984	Mar. 29, 1988	Butterfield
US	5,193,000	Aug. 28, 1991	Mar. 9, 1993	Lipton
US	5,523,886	Jan. 4, 1994	June 4, 1996	Johnson-Williams
US	5,606,348	Jan. 13, 1995	Feb. 25, 1997	Chiu
US	5,717,415	July 10, 1996	Feb. 10, 1998	Iue
US	6,052,390	Nov. 10, 1997	Apr. 18, 2000	Deliot
US	6,055,012	Dec. 27, 1996	Apr. 25, 2000	Haskell
US	6,075,556	Mar. 26, 1998	June 13, 2000	Urano
US	6,104,837	June 20, 1997	Aug. 15, 2000	Walker
US	6,111,979	Apr. 23, 1997	Aug. 29, 2000	Katto
US	6,139,490	Nov. 10, 1997	Oct. 31, 2000	Breidenthal
US	6,285,368	Feb. 2, 1998	Sept. 4, 2001	Sudo
US	6,456,432	Sept. 30, 1998	Sept. 24, 2002	Lazzaro
US	6,564,269	Sept. 8, 1999	May 13, 2003	Martin
US	6,657,655	Sept. 26, 2000	Dec. 2, 2003	Iizuka
US	6,778,168	Feb. 14, 2001	Aug. 17, 2004	Mamiya
US	6,903,780	Sept. 28, 2001	June 7, 2005	Mair
US	6,914,637	July 10, 2002	July 5, 2005	Wolf
US	7,136,415	Nov. 12, 2002	Nov. 14, 2006	Yun
US	7,143,328	Aug. 29, 2001	Nov, 28, 2006	Altmann
US	7,180,554	Jan. 14, 2002	Feb. 20, 2007	Divelbiss
US	7,209,496	Mar. 12, 2002	Apr. 24, 2007	Okamoto
US	7,215,809	Apr. 4, 2001	May 8, 2007	Sato
US	7,295,578	Sept. 12, 2001	Nov. 13, 2007	Lyle
US	7,319,720	Jan. 28, 2002	Jan. 15, 2008	Abrams, Jr.
US	7,724,211	Aug. 4, 2006	May 25, 2010	Slavenburg
US	7,926,949	July 20, 2007	Apr. 19, 2011	Boothroyd
US	7,996,869	Aug. 16, 2007	Aug. 9, 2011	Tu
US	8,051,217	Jan. 12, 2007	Nov. 1, 2011	Goodart
US	8,159,529	Jan. 17, 2008	Apr. 17, 2012	Yoshida
US	8,169,467	Aug. 4, 2006	May 1, 2012	Slavenburg
US	8,384,763	July 25, 2006	Feb. 26, 2013	Tam
US	8,392,958	Sept. 11, 2009	Mar. 5, 2013	Hayashi
US	8,401,359	Aug. 3, 2007	Mar. 19, 2013	Shoji
US	8,441,576	Jan. 13, 2010	May 14, 2013	Nakajima
US	8,479,253	Dec. 17, 2007	July 2, 2013	Glen
US	8,537,146	Dec. 4, 2006	Sept. 17, 2013	Nicklisch
US	8,544,047	July 14, 2011	Sept. 24, 2013	Tu
US	8,565,337	Feb. 7, 2007	Oct. 22, 2013	Lida
US	8,587,638	Sept. 25, 2006	Nov. 19, 2013	Pockett

102(a), (b), (e) and (g)) apply to the prior art identified in these Invalidity Contentions and the attached exhibits.

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	8,705,737	Oct. 22, 2007	Apr. 22, 2014	Suzuki ’737
US	8,866,971	Dec. 17, 2007	June 18, 2009	Glen
US	9,338,428	July 30, 2015	Nov. 19, 2015	Newton ’428
US	2002/0009137	Feb. 1, 2001	Jan. 24, 2002	Nelson
US	2002/0097869	Sept. 12, 2001	July 25, 2002	Pasqualino
US	2002/0167972	Mar. 12, 2002	Nov. 14, 2002	Okamoto
US	2002/0186322	Oct. 15, 2001	Dec. 12, 2002	Mair
US	2003/0007681	Sept. 12, 2002	Jan. 9, 2003	Baker
US	2003/0112507	Jan. 14, 2002	June 19, 2003	Divelbiss
US	2003/0198290	Apr. 19, 2002	Oct. 23, 2003	Millin
US	2003/0223499	Apr. 9, 2003	Dec. 4, 2003	Routhier
US	2004/0008893	July 9, 2004	January 15, 2004	Itoi
US	2004/0027452	Nov. 12, 2002	Feb. 12, 2004	Yun
US	2004/0120396	Aug. 26, 2003	June 24, 2004	Yun
US	2004/0143847	Dec. 11, 2003	July 22, 2004	Suzuki
US	2004/0218099	Mar. 19, 2004	Nov. 4, 2004	Washington
US	2005/0062846	Nov. 13, 2002	Mar. 24, 2005	Choi
US	2005/0117637	Oct. 8, 2004	June 2, 2005	Routhier
US	2005/0146521	Mar. 2, 2004	July 7, 2005	Kaye
US	2005/0185711	Feb. 20, 2004	Aug. 25, 2005	Pfister
US	2005/0213593	Mar. 10, 2005	Sept. 29, 2005	Anderson
US	2005/0259147	July 16, 2003	Nov. 24, 2005	Nam
US	2006/0010385	Sept. 14, 2005	Jan. 12, 2006	Sasaki
US	2006/0044388	Aug. 25, 2005	Mar. 2, 2006	Kim
US	2006/0050383	Jan. 19, 2004	Mar. 9, 2006	Takemoto
US	2006/0126919	Sept. 26, 2003	June 15, 2006	Kitaura
US	2006/0153289	Dec. 11, 2002	July 13, 2006	Choi
US	2006/0192776	Apr. 16, 2004	Aug. 31, 2006	Nomura
US	2006/0238613	June 22, 2006	Oct. 26, 2006	Takayama
US	2006/0269226	May 28, 2004	Nov. 30, 2006	Ito
US	2006/0279750	Jan. 5, 2006	Dec. 14, 2006	Ha
US	2007/0008314	July 3, 2006	Jan. 11, 2007	Song
US	2007/0009060	June 24, 2005	Jan. 11, 2007	Lavelle
US	2007/0011720	July 7, 2006	Jan. 11, 2007	Min
US	2007/0046697	Aug. 30, 2005	Mar. 1, 2007	Hussain
US	2007/0139624	Dec. 21, 2005	June 21, 2007	DeCusatis
US	2007/0139769	Dec. 21, 2005	June 21, 2007	DeCusatis
US	2007/0165304	Aug. 29, 2006	July 19, 2007	Tomita
US	2007/0188711	Feb. 9, 2007	Aug. 16, 2007	Sharp
US	2007/0242068	Apr. 17, 2007	Oct. 18, 2007	Han
US	2007/0257923	Mar. 15, 2007	Nov. 8, 2007	Whitby-Strevens
US	2007/0263937	May 12, 2006	Nov. 15, 2007	Rizko
US	2007/0291938	Oct. 12, 2006	Dec. 20, 2007	Rao

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
US	2007/0296859	May 8, 2007	Dec. 27, 2007	Suzuki
US	2008/0089250	Mar. 10, 2006	Apr. 17, 2008	Jung
US	2008/0112638	Oct. 19, 2007	May 15, 2008	Lee ’638
US	2008/0116949	Nov. 21, 2006	May 22, 2008	Nair
US	2008/0126591	Nov. 13, 2007	May 29, 2008	Kwon
US	2008/0134237	Aug. 16, 2007	June 5, 2008	Tu
US	2008/0151119	June 8, 2007	June 26, 2008	Suzuki
US	2008/0187028	Feb. 7, 2007	Aug. 7, 2008	Lida
US	2008/0205791	Nov. 13, 2007	Aug. 28, 2008	Ideses
US	2008/0225180	June 7, 2007	Sept. 18, 2008	Callway
US	2008/0036854	Dec. 29, 2006	Feb. 14, 2008	Elliott
US	2008/0310499	Dec. 11, 2006	Dec. 18, 2008	Kim
US	2009/0046993	Mar. 2, 2007	Feb. 19, 2009	Nishio
US	2009/0125968	Dec. 5, 2007	May 14, 2009	Perlman
US	2009/0128622	July 25, 2006	May 21, 2009	Uchiumi
US	2010/0118119	Oct. 8, 2007	May 13, 2010	Newton ’119
CN	101076130A	May 16, 2007	Nov. 21, 2007	Suzuki ’130A
DE	102005041249A1	Aug. 29, 2005	Mar. 1, 2007	Klippstein
EP	1486056B1	Dec. 5, 2002	Dec. 12, 2004	Wolf
EP	1816859A1	Feb. 2, 2007	Aug. 8, 2007	Eguren
GB	2311441A	Mar. 11, 1996	Sept. 24, 1997	Mowbray
JP	2000/338900A	May 27, 1999	Dec. 8, 2000	Niino
JP	2003/111101A	Sept. 26, 2001	Apr. 11, 2003	Masutani
JP	2004/214763A	July 29, 2004	Dec. 27, 2002	Takada ’763
JP	2004/274642	Mar. 12, 2003	Sept. 30, 2004	Takada ’642
JP	2005/006114	June 12, 2003	Jan. 6, 2005	Ishihara
JP	2005/117193	Oct. 3, 2003	Apr. 28, 2005	Hiroya
JP	2005/210700	Dec. 14, 2004	Aug. 4, 2005	Hibino
JP	2006/157605	Nov. 30, 2004	June 15, 2006	Hoshi
JP	2006/191357	Jan. 6, 2005	July 20, 2006	Sugawara
JP	2006/195018	Jan. 12, 2005	July 27, 2006	Takada ’018
JP	2006/295289	Apr. 6, 2005	Oct. 26, 2006	Takada ’289
JP	2007/166277	Dec. 14, 2005	June 28, 2007	Takada ’277
JP	2007/325101	June 2, 2006	Dec. 13, 2007	Matsuura
JP	3166346B2	Oct. 8, 1992	Apr. 28, 1994	Tadashi
JPH	0530538A	July 24, 1991	Feb. 5, 1993	Yoshida
JPH	063822A	June 23, 1992	Jan. 14, 1994	Nishimura
JPH	08251628A	Mar. 8, 1995	Sept. 27, 1996	Matsuzawa
JPH	09116931A	Oct. 18, 1995	May 2, 1997	Okada
JPH	10210508A	Jan. 17, 1997	Aug. 7, 1998	Kaneko
JPWO	2005/012980A1	July 30, 2003	Sept. 21, 2006	Seijiro
KR	100210777B1	Feb. 28, 1997	Oct. 26, 1998	Lee ’777
KR	100358021B1	Feb. 16, 1994	Dec. 30, 1995	Lue

Country	Patent or Pub. No.	Filing Date	Publication Date	Inventor
KR	20060130451A	June 14, 2005	Dec. 19, 2006	Ha
KR	19990060127A	Dec. 31, 1997	July 26, 1999	Bae
WO	97/48056	June 14, 1996	Dec. 18, 1997	Kim
WO	00/13423	Aug. 30, 1999	Mar. 9, 2000	Hanna
WO	02/35851	Oct. 11, 2001	May 2, 2002	Rennert
WO	2005/114998	Nov. 30, 2004	Dec. 1, 2005	Cho
WO	2006/137000	June 19, 2006	Dec. 28, 2006	De Jong
WO	2006/137006	June 20, 2006	Dec. 28, 2006	Funke
WO	2007/067020	Dec. 11, 2006	June 14, 2007	Kim
WO	2008/038068	Sept. 25, 2006	Apr. 3, 2008	Pockett

b. Prior Art Publications

The following publications are prior art under 35 U.S.C. §§ 102(a) and/or (b).

Title	Author/Publisher	Date of Publication
ISO/IEC23002-3, "Representation of Auxiliary Video and Supplemental Information"	MPEG	Oct. 15, 2007
MPEG-C Part 3: Enabling The Introduction Of Video Plus Depth Contents	Bourge et al.	June 2006
Comparison of Stereo Video Coding Support in MPEG-4 MAC, H.264/AVC and H.264/SVC	Hewage et al.	July 2007
A Standards-Based, Flexible, End-to-End Multi-View Video Streaming Architecture	Kurutepe et al.	Nov. 12, 2007
Coding Algorithms for 3DTV—A Survey	Smolic et al.	Oct. 29, 2007
Integration of 3D Video Into the Blu-ray Format	D.D.R.J. Bolio	Oct. 2007
3DTV over IP	Tekalp et al.	Nov. 27, 2007
42-inch 3D-Intelligent Display User Manual	Philips	Mar. 22, 2006
Philips Multiview 3D Display Solutions	Philips	June 17, 2004
3-D TV That Actually Works	Wired	Aug. 22, 2006
Locally Switchable 3D Displays	The Society for Information Display	June 2006
Computer Shopper Magazine	*Computer Shopper* Magazine	Aug. 2006
Philips 3D Solutions	Philips	May 2006
Philips 42 inch 3D Display wins Gold Award at SID2006	New Atlas	June 2006
Philips to reveal 3D display innovations at SID2006	Designer Today Magazine	June 7, 2008

Title	Author/Publisher	Date of Publication
Philips 3D solutions: from content creation to visualization	IEEE Computer Society	June 2006
3D graphics rendering for multiview displays	Eindhoven University of Technology	Mar. 2005
GPU-based rendering to a multiview display	Eindhoven University of Technology	June 2006
Chapter 30. The GeForce 6 Series GPU Architecture	NVIDIA	Apr. 2005
Stereoscopic Player and Stereoscopic Multiplexer: a computer-based system for stereoscopic video playback and recording	Wimmer	Mar. 22, 2005
NVIDIA's Stereoscopic 3D Development Guide	NVIDIA	Dec. 9, 2004
NVIDIA 3D Stereo User's Guide (for Release 75)	NVIDIA	July 18, 2005
NVIDIA GPU Programming Guide Version 2.5.0	NVIDIA	Mar. 1, 2006
NVIDIA 3D Stereo User's Guide (for Detonator XP)	NVIDIA	Nov. 8, 2001
ForceWare Graphics Drivers, NVIDIA 3D Stereo User's Guide (for Release 55)	NVIDIA	Mar. 9, 2004
ForceWare Graphics Driver User's Guide	NVIDIA	Oct. 2004
NVIDIA Quadro Professional Drivers – Workstation User's Guide	NVIDIA	July 2006
ForceWare Graphics Driver User's Guide (November 2005)	NVIDIA	Nov. 2005
ForceWare Graphics Driver User's Guide (March 2005)	NVIDIA	Mar. 2005
ForceWare Graphics Drivers Release 80 Notes Version 81.95	NVIDIA	Nov. 2005
Dell Inspiron 9300 Owner's Manual ("Dell Inspiron 9300")	Dell	Jan. 2005
Sharp LL-151-3D Operation Manual ("Sharp LL-151-3D")	Sharp	Early 2000s
Challenges And Opportunities In Video Coding For 3D TV	IEEE	July 9, 2006
Design and Evaluation of a 3D Video System Based on H.264 View Coding	NOSSDAV	May 26, 2006
Sharp Announces Second Generation 3D Notebook	Phys.org	Mar. 8, 2006
Sharp develops 3D flat screen	CNET	Sept. 27, 2002
Sharp introduces 3-D computer display	NBC News	Aug. 9, 2004
Sharp Introduces 3D LCD Color Monitor that provides a stereoscopic display	Phys.org	June 18, 2004

Title	Author/Publisher	Date of Publication
Sharp's 3D LCD Technology Now Available for Desktop Computers; No-Glasses 3D Technology Now Available in 15-Inch Desktop	Phys.org	Aug. 9, 2004
Sharp 3D 'Glasses Free' Display Technology	Sharp	Oct. 21, 2006
3D Display Monitor Without the Need For Special Glasses	Sharp	Nov. 26, 2005
3D TV Using MPEG-2 and H.264 View Coding and Autostereoscopic Displays	Association for Computing Machinery	Oct. 23, 2006
DIA Awards Archive	The Society For Information Display	Mar. 21, 2023
Enabling Introduction of Stereoscopic (3D) Video: Formats and Compression Standards	Bruls et al.	Sept. 16, 2007
Characterising Sources of Ghosting in Time-Sequential Stereoscopic Video Displays	Woods et al.	May 23, 2002
Image Distortions in Stereoscopic Video Systems	Woods et al.; SPIE	Feb. 1993
3-D MPEG-2 video transmission over broadband network and broadcast channels	Gagnon et al.; Communications Research Centre Canada, SPIE	2001
A 3D-TV System Based On Video Plus Depth Information	Fehn; IEEE	2003
A stereoscopic television system (3D-TV) and compatible transmission on a MAC channel (3D-MAC)	Chassaing et al.; Elsevier Science Publishers B.V.	1991
Advancements in 3-D Stereoscopic Display Technologies: Micropolarizers, Improved LC Shutters, Spectral Multiplexing, and CLC Inks	Cardillo et al.; Journal of Imaging Science and Technology	1998
An HDTV-Compatible 3DTV Broadcasting System	Hur et al.; ETRI Journal	April 2004
The HoloVizio System	Balogh et al.; SPIE	2006
Depth Map Generation For 2D-To-3D Conversion By Short-Term Motion Assisted Color Segmentation	Chang et al.; IEEE	2007
3D without glasses comes to high-definition displays	Embedded	Aug. 16, 2006
Experimental Service of 3DTV Broadcasting Relay in Korea	Hur et al.; SPIE	2002
Field-Sequential 3D Video Multiplexer	Curtin University	July 1, 2003

Title	Author/Publisher	Date of Publication
A Prototype 3D Mobile Phone Equipped with a Next Generation Autostereoscopic Display	Flack et al.; SPIE	2007
High-bandwidth Digital Content Protection System	Digital Content Protection LLC	June 9, 2003
HDMI: The digital display link	O'Donnell; EE Times	May 9, 2007
High-Definition Multimedia Interface Specification Version 1.3a ("HDMI-1.3")	HDMI Licensing LLC	Nov. 10, 2006
A Single Chip DLP Projector for Stereoscopic Images of High Color Quality and Resolution	Hopp et al.; The Eurographics Association	2007
Depth map creation and image-based rendering for advanced 3DTV services providing interoperability and scalability	Kauff et al.; Elsevier B.V.	2007
2D-To-3D Stereoscopic Conversion: Depth-Map Estimation in a 2D Single-View Image	Ko et al.; SPIE	2007
Monocular multi-view stereoscopic 3-D vision system	Sakamoto et al.; SPIE	2001
Real-Time Transmission of Stereo Images Over The Access Grid	Mowafi et al.; IEEE	2002
AFM'07: Second Workshop on Automated Formal Methods	Rushby et al.; SRI International	Nov. 6, 2007
Software issues for PC-based stereoscopic displays: how to make PC users see stereo	Sawdai et al.; SPIE	Jan. 1998
Geo-referenced 3D Video as visualization and measurement tool for Cultural Heritage	Sechidis et al.; The Aristotle University of Thessaloniki	Jan. 2002
Hardware Implementation of FPGA-based Real-Time Formatter for 3D Display	Seo et al.	2005
PC-Based Virtual Reality for CAD Model Viewing	Seth et al.; The Journal of Technology Studies	2004
Front and Rear Image Generation Module for Depth-fused 3-D Display	Takada et al.; IEEE	Aug. 2006
Converting 2D to 3D: A Survey	Wei; TUDelft	Dec. 2005
Proposed Standard For Field-Sequential 3D Television – The Field Polarity for Storing 3D (Stereoscopic) Left and Right Images in the Even and Odd Fields of the NTSC and PAL Video Standards	Woods; SPIE	Dec. 29, 1999
A PC-based stereoscopic video walkthrough	Woods et al.; SPIE	Jan. 1999

Title	Author/Publisher	Date of Publication
Proposed Standard For Field-Sequential 3D Television – A method for the Recording and Playback of Stereoscopic 3D Images and Video Sequences with the NTSC, PAL and SECAM Video Standards.	Woods; SPIE	Jan. 2001
Electronic Stereoscopic Presentations – What tools are available and what tools are needed	Woods; SPIE	2001
VESA Monitor Control Command Set (MCCS) Standard Version 3 ("MCCS-3.0")	Video Electronics Standards Association	July 27, 2006
DisplayPort Standard Version 1 ("DisplayPort-1.0")	Video Electronics Standards Association	May 1, 2006
DisplayPort Standard Version 1.1 ("DisplayPort-1.1")	Video Electronics Standards Association	Mar. 19, 2007
DisplayPort Standard Version 1.1a ("DisplayPort-1.1a") and certain working drafts and proposals published during development of DisplayPort-1.1a ("Draft_DP1.1a")	Video Electronics Standards Association	Before December 18, 2007
VESA Enhanced Extended Display Identification Data Standard (Defines EDID Structure Version 1, Revision 3), Release A, Revision 1 ("EEDID-A1")	Video Electronics Standards Association	Feb. 9, 2000
VESA Enhanced Extended Display Identification Data Standard (Defines EDID Structure Version 1, Revision 4), Release A, Revision 2 ("EEDID-A2")	Video Electronics Standards Association	Sept. 25, 2006
Interactive 3-DTV—Concepts and Key Technologies	Fehn et al.; IEEE	Mar. 3, 2006
Introducing DLP 3DTV	Hutchinson et al.; EE|Times; Texas Instruments	Dec. 19, 2007
Video Processing For DLP™ Display Systems	Markandey	1996
Mitsubishi WD57833 Owner's Guide	MITSUBISHI DIGITAL ELECTRONICS AMERICA, INC	2007
Samsung DLP TV Owner's Instructions HL-T4675S	SAMSUNG ELECTRONICS CO., LTD	2007

Title	Author/Publisher	Date of Publication
Samsung DLP TV Owner's Instructions HL-T7288W	SAMSUNG ELECTRONICS CO., LTD	2007
DLP 3-D HDTV Technology	Texas Instruments	2007
HD-SDI, HDMI, and Tempus Fugit	Somers; ExtroNews; Extron	Summer 2007
Flexible Pixel Compositor for Plug-and-Play Multi-Projector Displays	Yang et al.; IEEE	June 17-22, 2007
RTP Payload Format for SMPTE 292M Video	Gharai et al.; Society of Motion Picture and Television Engineers (SMPTE)	Mar. 2003
Display Data Channel Command Interface Standard Version 1.1	Video Electronics Standards Association	Oct. 29, 2004
Accell to Showcase World's First HDMI 1.3 Cable at CES 2007	HDMI Licensing, LLC	Nov. 30, 2006
HDMI TM 1.3 Is Named Innovations 2007 Design and Engineering Award Honoree	HDMI Licensing, LLC	Nov. 8, 2006
HDMI Licensing Launches HDMI 1.3 World Tour, As First Products with HDMI 1.3 Features Hit the Market	HDMI Licensing, LLC	Oct. 26, 2006
Video Electronics Standards Association (VESA) Approves DisplayPort Version 1.1: Latest Version Supports HDCP, Enables Broad Industry Support	Video Electronics Standards Association	Apr. 2, 2007
3D Videocommunication: Algorithms, Concepts and Real-Time Systems in Human Centred Communication	Schreer et al.; John Wiley & Sons, Ltd.	2005
2D/3D Switchable Displays	Jacobs et al.	Jan. 2003
Intuitive Surgical (ISRG) Company Profile	FinanceCharts	1995
Philips Showcased 3D Displays at CES	Softpedia	Jan. 13, 2007
HL-T5087S	Samsung Electronics America, Inc.	2007
Samsung HL-T5087S	Crutchfield	Aug. 18, 2007
The Illustrated 3D HDTV List	Woods; 3DMovieList	May 28, 2023

c. Prior Art Systems

The Asserted Claims of the '010 Patent are invalid under 35 U.S.C. § 102(a) and (b) because they were known by others, publicly used, and on sale in the United States before they were purportedly invented and more than one year before the priority date of the Asserted Claims.

Additionally, the Asserted Claims are invalid under 35 U.S.C. § 102(g) because any purported invention was made in this country by another who had not abandoned, suppressed, or concealed the purported invention. For example, the foregoing patents and publications are evidence of such prior art systems and inventions. Additionally, HP relies on the systems identified in the Exhibits hereto and the systems identified below.

System	Date of Prior Invention, Sale, Use, Or Knowledge
Sharp 3D System[8]	No later than March 2005
Philips 3D System[9]	No later than March 2006
MPEG-C Part 3 Specification and Products[10]	No later than November 2007
Texas Instruments DLP 3DTV Products[11]	No later than April 2007

d. Bases for Anticipation and/or Obviousness

Each prior art reference identified in Exhibits 010-A through 010-P expressly, implicitly, or inherently anticipates and/or renders obvious the Asserted Claims of the '010 Patent, either alone or in combination with other prior art references (*e.g.*, the references identified in Exhibits 010-A through 010-P or other references identified above) or the knowledge of the person of ordinary skill in the art at the time of the alleged invention. Each of the prior art references included in Exhibits 010-A through 010-P can be combined with any other prior art reference in Exhibits

[8] The Sharp 3D System consisted of products using Sharp stereoscopic 3D technology such as, for example, the Sharp LL-151-3D LCD Monitor, Dell Inspiron 9300 Laptop, and NVIDIA GeForce Go 6800 GPU, as described in Exhibits 010-I and 786-I.

[9] The Philips 3D System consisted of products using Philips stereoscopic 3D technology such as, for example, the Philips 42-inch 3D-Intelligent Display, Dell Inspiron 9300 Laptop, and NVIDIA GeForce Go 6800 GPU, as described in Exhibits 010-H and 786-H.

[10] The MPEG-C Part 3 Specification and Products consisted of the MPEG-C Part 3 specification and products implementing the MPEG-C Part 3 specification such as, for example, the Philips 42-inch 3D-Intelligent Display and the Sigma Designs Blu-ray reference board, as described in Exhibits 010-J and 786-J.

[11] The Texas Instruments DLP 3DTV Products using Texas Instruments stereoscopic 3D technology, such as, for example, the Samsung HL-T5087S and Mitsubishi WD-57833, as described in Exhibits 010-O and 786-O.

010-A through 010-P, or identified above, to render obvious the Asserted Claims of the '010 Patent and the examples of combinations below are intended for emphasis only.[12]

In the table below, HP identifies a non-exhaustive list of prior art references that, alone or in combination, anticipate and/or render obvious the Asserted Claims. Any prior art not identified, or any prior art combination not expressly identified in the table below in no way exhausts the types of combinations of references that would have naturally been considered as part of the exercise of ordinary skill by one skilled in the art.

Exhibit	Reference(s)
010-A	Suzuki '859 either alone or in combination with one or more of Yoshida '529, Tu, Yun, Glen, Cho, DeCusatis, Matsuura, Elliott, Iue, Ishihara, Takada '642, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-B	Takada '642 either alone or in combination with one or more of Tu, Suzuki '859, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-C	Takada '289 either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-D	Newton '428 either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi,Funke, and/or De Jong
010-E	Hibino either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-F	Takada '277 either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-G	Takayama either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-H	The Philips System either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-I	The Sharp System either alone or in combination with one or more of Suzuki '859, Tu, Yun, Yoshida '529, Matsuura, Elliott, Glen, Cho,

[12] For example, each of Suzuki, Takada '642, Takada '289, Newton '428, Hibino, Takada '277, Takayama, the Philips System, and the Sharp System may be combined with each other to render obvious the Asserted Claims of the '010 Patent.

Exhibit	Reference(s)
	DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-J	MPEG-C Part 3 Specification And Products either alone or in combination with one or more of Suzuki ’859, Tu, Yun, Yoshida ’529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-K	HDMI-1.3 either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, Draft-DP1.1a, and/or Takayama
010-L	DisplayPort-1.0 either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, Draft-DP1.1a, and/or Takayama
010-M	DisplayPort-1.1 either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, Draft-DP1.1a, and/or Takayama
010-N	Suzuki ’130A either alone or in combination with one or more of Suzuki ’859, Tu, Yun, Yoshida ’529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-O	TI DLP 3DTV System either alone or in combination with one or more of Suzuki ’859, Tu, Yun, Yoshida ’529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
010-P	Draft-DP1.1a either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, and/or Takayama

The accompanying claim charts (Exhibits 010-A through 010-P) set forth example bases for anticipation and obviousness, identifying where each reference discloses, alone or in combination with other references, each limitation of the Asserted Claims of the ’010 Patent on a limitation-by-limitation basis. HP’s claim charts are exemplary and not exhaustive.

e. Obviousness Combinations

Subject to HP's reservation of rights, HP contends that all of the prior art references, as identified above and described in the charts attached as Exhibits 010-A through 010-P, by themselves anticipate the asserted claim in accordance with 35 U.S.C. § 102 and/or render the Asserted Claims of the '010 Patent obvious under 35 U.S.C. § 103, as more specifically noted in the attached charts.

The cited portions of the prior art references are examples and representative of the content of the prior art references and should be understood in the context of the reference as a whole, as understood by one of ordinary skill in the art. To the extent a cited prior art reference is deemed not to anticipate or render obvious a claim as noted in the attached charts for failing to teach or suggest one or more limitations of that claim, that claim would nonetheless have been obvious to one of ordinary skill in the art at the time of the invention by the combination of the cited prior art reference with one or more other prior art references and/or common knowledge disclosing the missing claim limitations. For example, any of the references listed above, to the extent it does not explicitly or inherently disclose any limitation, could be combined with any one or more of the other references listed above which discloses that limitation.

HP reserves the right to supplement the obviousness arguments using any references listed above, or any references that may become known to HP during the course of discovery. Further, the suggested obviousness combinations are in addition to HP's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not anticipatory on its own.

f. Motivation to Combine and Reasonable Expectation of Success

With respect to the '010 Patent, the prior art identified above non-exhaustively illustrates the scope and content of the prior art. As detailed in claim charts 010-A through 010-P, the prior

art included each limitation recited in the Asserted Claims of the ’010 Patent. To the extent a cited prior art reference is deemed not to anticipate a claim, the only difference between the claimed invention and the prior art is the lack of actual combination of the elements in a single prior art reference. However, for at least the reasons discussed above and the additional reasons discussed below, a POSITA would have been motivated to combine each of the above prior art references. A POSITA pertaining to the ’010 Patent at the relevant time would have been someone with a bachelor’s degree in computer science, computer engineering, electrical engineering, or equivalent training, and approximately two years’ experience working in video processing and would be knowledgeable regarding audio-visual communications and stereoscopic display techniques. Lack of work experience can be substituted for additional education, and vice versa.

A POSITA would have numerous motivations to combine each of the above-referenced prior art. For example, as the United States Supreme Court held in *KSR*, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” 550 U.S. at 416. The Supreme Court further held that, “[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . .” *Id.* at 417. Accordingly, a person of skill in the art would have been motivated to combine or adapt known or familiar methods in the art.

The combinations of the prior art references identified above would have been obvious in view of: (1) the knowledge of persons of ordinary skill in the art; (2) the express, implied and inherent teachings of the prior art, or the interrelated teachings of multiple prior art references; (3) the nature of the problem being solved; (4) the fact that they are combinations of known methods to yield predictable results; (5) the fact that they involve a simple substitution of one known, equivalent element for another to obtain predictable results; (6) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces; (7) the existence of a known need or problem in the field of endeavor at the time of the invention(s); and/or (8) a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Furthermore, the combination of the prior art references identified above would have been obvious because the combination represents the known potential options with a reasonable expectation of success. A POSITA would have had a reasonable expectation of arriving at the purported claimed inventions because they describe similar systems, and were invented around the same timeframe, and are thus compatible with one another.

Indeed, to the extent the prior art references identified herein do not anticipate the Asserted Claims of the ’010 Patent, the limitations of these claims are merely obvious variations of the systems and methods disclosed in the various prior art references. As discussed below and in the prior art references, all of these were well-known, conventional technologies prior to the Asserted Claims of the ’010 Patent. The ’010 Patent does not purport to have invented any of these

technologies; rather, the ’010 Patent simply tacked on these conventional prior art approaches to conventional and generic known prior techniques. As such, the Asserted Claims merely incorporate the knowledge of a POSITA. The mere amalgamation of such conventional technologies here is not inventive—it is simply combining or substituting well-known, conventional prior art elements according to known methods to yield predictable results.

For example, a POSITA would have been motivated to combine the prior art identified in Exhibits 010-A through 010-P based on the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons having ordinary skill in the art. Each reference in Exhibits 010-A through 010-P discloses methods and systems transmitting and/or receiving image data, such as 2D and 3D stereoscopic image data, across an interface. The references identified in Exhibits 010-A through 010-P are analogous prior art to the subject matter of the Asserted Claims and are proper to combine. Because these prior art references exist within a single area (transmission and/or processing of image data across an interface), it would have been obvious for a POSITA to look from one piece of prior art to another to find any missing functionality they desired to implement, or to replace functionality in one prior art reference for that described in another reference. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’010 patent.

Combining the similar references identified herein and in Exhibits 010-A through 010-P, which address similar problems as noted above, would have been obvious and straightforward to a POSITA. *First*, the combinations represent no more than the use of known techniques according to known methods in the same ways to yield predictable results. For example, the references generally address the same field of transmitting and/or receiving image data, such as 2D and 3D

stereoscopic image data, across an interface, and one of ordinary skill in the art would be motivated by such obvious considerations as enhancing the amount of data that could be transmitted or received over the interface. *Second*, the references themselves identify the known problems and provide known solutions to address those problems in the field. Indeed, the references identified herein and in Exhibits 010-A through 010-P demonstrate that there was, at the time of the alleged invention, a finite number of identified, predictable solutions for enhancing the transmission and/or receipt of image data that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious. *Third*, the combinations are motivated because a person of ordinary skill would appreciate that they improve the systems in the prior art by providing further techniques to transmit and/or receive 2D and stereoscopic 3D data over an interface, including by providing techniques for formatting and processing image data in 2D and stereoscopic 3D modes, multiplexing 3D stereoscopic image components so the components may be transmitted over the existing capacity of an interface, and/or signaling whether a 2D or stereoscopic 3D mode is being used and the characteristics of the stereoscopic 3D data. *Fourth*, because the problems and solutions were known in the field, the particular arrangements and combinations of references would yield predictable results. *Fifth*, a number of the references themselves provide express motivations that would have led a person of ordinary skill to their combination. For example, the references acknowledge that formatting image data in a 2D or stereoscopic 3D mode and formatting stereoscopic 3D data so that it may be transmitted over the existing capacity of an interface that typically transmits 2D data can be important.

Below, HP has provided several additional examples of the motivations that a POSITA would have had to combine certain of the prior art references in Exhibits 010-A through 010-P. The inclusion of certain example combinations herein does not exclude other combinations based

on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. Instead, in many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined.

As one example, methods and systems that formatted image data for transmission across an interface from a source device to a sink device in either a 2D or stereoscopic 3D mode were well-known and within the skill of a POSITA at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Philips System, and the Sharp System. For example, Suzuki '859 describes both transmission of "typical video data (specifically, video data not for three dimensional display)" and "video data transmission for three-dimensional display." Suzuki '859, [0053], [0068]. The '010 patent also concedes that "[s]chemes for conveying stereoscopic image data within the confines of existing display interfaces" were well-known, such as the Philips WOWvx system which transmitted both "[s]ub-frames [that] carrie[d] 2D image data and a second of the sub-frames [that] carrie[d] depth information." '010 patent, 1:42-51. These methods and systems included techniques for setting the formatter to operate in a 2D or stereoscopic 3D mode, including setting the mode according to a signal received from the sink device, as disclosed by at least Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani,

Yoshida ’529, Hiroya, Ha, Nelson, Itoi, Funke, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. *See, e.g.*, Exs. 010-A through 010-P, at claim element 1(b). A person of ordinary skill would have been motivated to combine techniques for operating a formatter a 2D or 3D stereoscopic mode with references disclosing transmitting image data because doing so would allow the user to view both 2D and 3D stereoscopic content. A POSITA would have had a reasonable expectation of success with combining these references because formatters operable to transmit 2D and stereoscopic 3D image data across an interface are readily adaptable to systems that transmit image data across an interface and would amount to using known techniques for implementing multi-mode formatters in existing transmission interfaces in predictable ways.

As a further example, methods and systems that processed image data received across an interface at a sink device in either a 2D or stereoscopic 3D mode were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki ’859, Takada ’289, Newton ’428, Takada ’277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida ’529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki ’130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. For example, Suzuki ’859 explains that “[t]ypical display processing for 2D display is performed” but “in the case where it is determined that the three-dimensional mode has been set, the video data for the left eye and the video data for the right eye are separated (or combined) and corresponding display processing for three-dimensional image is performed.” Suzuki ’859, [0065], [0066]. The ’010 patent also concedes that “[s]chemes for conveying stereoscopic image data within the confines of existing display interfaces” were

well-known, such as the Philips WOWvx system which, in the case of a 3D mode, "extracts depth data from the second sub-frame and creates a 3D image having a resolution of the first sub-frame." '010 patent, 1:42-56. These systems and methods included techniques for configuring the sink device to process the received image data in either a 2D or stereoscopic 3D mode, including setting the mode according to the capabilities of the source device, as disclosed by at least Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. *See, e.g.*, Exs. 010-A through 010-P, at claim element 12(b). A person of ordinary skill would have been motivated to combine techniques for processing image data in a 2D or stereoscopic 3D mode with references disclosing receiving image data over an interface because doing so would allow sink devices to process both 2D and stereoscopic 3D data for users. Making these combinations would be straightforward because processors operable to process 2D and stereoscopic 3D image data received from a source device are readily adaptable to systems that receive image data across an interface, and would amount to using known techniques for implementing multi-mode processors in existing transmission interfaces in predictable ways.

As a further example, methods and systems that multiplexed and demultiplexed components of 3D stereoscopic image data so that the 3D stereoscopic image data may be transmitted over the existing capacity of an interface that typically transmits 2D data were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '642, Takada '289, Hibino, Takada '277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, De

Jong, Matsuura, Masutani, Yoshida ’529, Glen, DeCusatis, Ito, Cho, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki ’130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. The ’010 patent itself concedes that “[s]chemes for conveying stereoscopic image data within the confines of existing display interfaces” were well-known, such as the Philips WOWvx system which “divides the overall display frame into a number of separate regions where different data can be carried. The overall frame is divided into two sub-frames, arranged side-by-side: a first of the sub-frames carries 2D image data and a second of the sub-frames carries depth information.” ’010 patent, 1:42-51. These systems and methods included techniques for multiplexing and demultiplexing left and right eye image data or 2D data and depth information as disclosed by at least Suzuki ’859, Takada ’642, Takada ’289, Hibino, Takada ’277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, De Jong, Matsuura, Masutani, Yoshida ’529, Glen, DeCusatis, Ito, Cho, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki ’130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. *See, e.g.*, Exs. 010-A through 010-P, at claim elements 1(d), 1(e), 12(d), 12(e). A person of ordinary skill would have been motivated to combine techniques for multiplexing and demultiplexing components of 3D stereoscopic image data with references disclosing transmitting or receiving data over an interface so that stereoscopic 3D data may be transmitted and received using the capacity of an existing interface that typically transmits 2D data, without needing to change the configuration of the interface. Making these combinations would be straightforward because systems and techniques for multiplexing and de-multiplexing stereoscopic image data are readily adaptable to systems that transmit and receive image data across an interface, and amount to using known techniques for

generating and processing multiplexed data in predictable ways using the existing capacity of the interface.

As a further example, methods and systems that transmitted signaling information informing a sink device of whether received image data is formatted in a 2D or stereoscopic 3D mode and the characteristics of the transmitted stereoscopic 3D data were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Cho, Ito, DeCusatis, De Jong, Tu, Yoshida '529, Klippstein, Masutani, Matsuura, Glen, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. The '010 patent itself concedes that there were well-known methods for signaling a 3D mode and the characteristics of the 3D data, such as the use of conventional HDMI Data Island Packets. For example, "a WOWvx encoded image as described in the background section, comprises a 2D image, depth information and/or occlusion information already embedded into separate regions of a conventional image." '010 patent, 10:1-4. "In order to identify such a 3D image, an HDMI Data Island Packet (typically a General Control Packet, Auxiliary Video InfoFrame (AVI) packet or specifically designated InfoFrame Packet) indicates this method. The information in this Packet identifies: the current stereoscopic method (*e.g.* 2D+Depth) being used; any information pertaining to this method which is required by the display." *Id.*, 10:12-20. These systems and methods included techniques for transmitting the format of stereoscopic 3D data, such as left eye data and right eye data or 2D data and depth information, as disclosed by at least Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2,

MCCS-3.0, Cho, Ito, DeCusatis, De Jong, Tu, Yoshida '529, Klippstein, Masutani, Matsuura, Glen, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. *See, e.g.*, Exs. 010-A through 010-Pat claim elements 1(f), 12(f). A person of ordinary skill would have been motivated to combine these techniques for signaling whether the image data is formatted in a 2D or stereoscopic 3D mode, and the characteristics of the transmitted data, with references disclosing transmitting or receiving data over an interface so that the sink device can determine the format and configuration of the received image data so it can display the data properly. Making these combinations would be straightforward because systems and techniques for transmitting signaling information informing a sink device of whether received image data is formatted in a 2D or stereoscopic 3D mode and the characteristics of the transmitted stereoscopic 3D data are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and amount to using known techniques for sending signaling information between source and sink devices in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takada '277, Takayama, the Philips System, the Sharp System, the MPEG-C Part 3 Specification and Products, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, and the TI DLP 3DTV System with each other. A POSITA would have been motivated to combine these references because they all disclose features of and/or applicable to interfaces that transmit image information from a source device to a sink device. *See* Exs. 010-A through 010-P, at claim elements 1(pre)(i), 1(pre)(ii), 12(pre)(i), 12(pre)(ii). A POSITA would have recognized that Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takada '277, Takayama, the Philips System, the Sharp System, the MPEG-

C Part 3 Specification And Products, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, and TI DLP 3DTV System include the same or similar types of interface parts that support transmitting pixel information between a source device and a sink device, and accordingly would be motivated to combine those references to improve the usability of the interfaces for transmitting both 2D and stereoscopic 3D data. A POSITA would have had a reasonable expectation of success with combining these references because they all describe similar systems—*e.g.*, involving transmission of 2D and stereoscopic 3D data across an interface, formatting and processing the image data according to a 2D or stereoscopic 3D mode, and/or indicating the type of mode and characteristics of the stereoscopic 3D data.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, the Philips System, the Sharp System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification And Products with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Yun, Matsuura, Glen, Cho, and DeCusatis. A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Yun, Matsuura, Glen, Cho, and DeCusatis disclose interface parts in source and/or sink devices for transmitting and/or processing image data, such as uncompressed pixel information, that can be used in the image data transmission systems disclosed in Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. A POSITA would recognize that Yoshida

’529’s, Tu’s, Yun’s, Matsuura’s, Glen’s, Cho’s, and DeCusatis’s disclosure of interface parts for transmitting and/or processing image data would be useful in image data transmission systems, and accordingly would have been motivated to combine Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate the transmission and processing of image data, including uncompressed pixel information, between source and sink devices. Making these combinations would have been straightforward because dedicated interface parts are readily adaptable to systems that transmit and receive data over interfaces such as HDMI and would amount to using known interface part configurations in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’642, Takada ’289, Takada ’277, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Yoshida ’529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis. A POSITA would be motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis disclose inputs for receiving image data, including from a transmission interface, which may be used to receive the image data disclosed in Suzuki ’859, Takada ’642, Takada ’289, Takada ’277, the Philips System, the Sharp System, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, and the MPEG-C Part 3 Specification And Products. A POSITA would recognize that EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Ito’s, De Jong’s, Masutani’s, Klippstein’s, Kaneko’s, Hiroya’s, Ha’s,

Nelson's, Funke's, Yoshida '529's, Matsuura's, Elliott's, Tu's, Yun's, Glen's, Cho's, and DeCusatis's disclosure of inputs for receiving image data would be useful in systems that format, transmit, and receive image data across an interface, and accordingly would be motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis with the one or more additional references Suzuki '859, Takada '642, Takada '289, Takada '277, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate the inputting, formatting, transmitting, and receiving of image data across an interface. Making these combinations would be straightforward because inputs for receiving image data are readily adaptable to systems that already have interconnections for transporting image data and would amount to using known techniques and systems for data inputs in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Takada '642, Takada '289, Hibino, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products with one or more of Yoshida '529, Matsuura, Elliott, Tu, Yun, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Yoshida '529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis disclose formatters that format image data for transmission over an interface that are operable in both 2D and stereoscopic 3D modes, which may be used in the systems that transmit image data from source devices to sink devices disclosed in Suzuki '859, Takada '642, Takada '289, Hibino, Suzuki

’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. A POSITA would have recognized that EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Ito’s, De Jong’s, Masutani’s, Klippstein’s, Kaneko’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, Yoshida ’529’s, Matsuura’s, Elliott’s, Tu’s, Yun’s, Glen’s, Cho’s, and DeCusatis’s disclosure of formatters operable in 2D and stereoscopic 3D modes would be useful in systems that transmit image data, such as 2D and stereoscopic 3D data, and accordingly would be motivated to combine Suzuki ’859, Takada ’642, Takada ’289, Hibino, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate formatting image data for transmission across an interface. Making these combinations would have been straightforward because formatters operable to transmit 2D and stereoscopic 3D image data across an interface are readily adaptable to systems that transmit image data across an interface and would have amounted to using known techniques for implementing multi-mode formatters in existing transmission interfaces in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’642, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis. A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis

disclose components that process received image data and are operable in both 2D and stereoscopic 3D modes according to signals from the source device and may be used in systems that receive image data from a source device, as disclosed in Suzuki ’859, Takada ’642, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. A POSITA would have recognized that EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Ito’s, De Jong’s, Masutani’s, Klippstein’s, Kaneko’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, Yoshida ’529’s, Matsuura’s, Elliott’s, Tu’s, Yun’s, Glen’s, Cho’s, and DeCusatis’s disclosure of processors operable in 2D and stereoscopic 3D modes according to signal information from the source device would be useful in systems that receive 2D data or stereoscopic 3D data from a source device, and accordingly would be motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Matsuura, Elliott, Tu, Yun, Glen, Cho, and DeCusatis with the one or more of Suzuki ’859, Takada ’642, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate processing image data that has been received across an interface. Making these combinations would have been straightforward because processors operable to process 2D and stereoscopic 3D image data received from a source device are readily adaptable to systems that receive image data across an interface and would amount to using known techniques for implementing multi-mode processors in existing transmission interfaces in predictable ways.

As a further example, a POSITA would have been motivated to combine Takada ’642, Newton ’428, Hibino, Takada ’277, Takayama, Suzuki ’130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and

the MPEG-C Part 3 Specification And Products with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Yun, Glen, and DeCusatis. A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Glen, DeCusatis, and Yun disclose systems and techniques for generating and extracting 2D image data transmitted over the existing capacity of an interface, which may be used in the systems transmitting and receiving image data disclosed in Takada '642, Newton '428, Hibino, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. A POSITA would have recognized that EEDID-A1's, EEDID-A2's, MCCS-3.0's, Ito's, De Jong's, Masutani's, Klippstein's, Hiroya's, Ha's, Nelson's, Funke's, Yoshida '529's, Matsuura's, Yun's, Glen's, and DeCusatis's disclosure of systems that generate and extract 2D image data would have been useful in systems that transmit and receive image data for display, so that 2D image data may be provided in addition to other types of image data without reconfiguring the interface. Accordingly, a POSITA would have been motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Yun, Glen, and DeCusatis with the one or more of Takada '642, Newton '428, Hibino, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate transmission of 2D image data over an existing interface so that users can view 2D content. Making these combinations would have been straightforward because systems and techniques for generating and extracting 2D image data transmitted over the existing

capacity of an interface are readily adaptable to systems with interfaces for transmitting image data, and amount to using known techniques for utilizing the data capacity of an interface in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products, and Suzuki ’130A with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Hiroya, Ha, Nelson, Itoi, Funke, Masutani, De Jong, Klippstein, Yoshida ’529, Matsuura, Elliott, Yun, Cho, DeCusatis, Iue, and Ishihara. A POSITA would be motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Masutani, De Jong, Yoshida ’529, Matsuura, Elliott, Yun, Cho, DeCusatis, Iue, and Ishihara disclose systems and techniques for generating stereoscopic 3D data for transmission across an interface according to signal information received from a sink device, which may be used in systems that transmit image data disclosed in Suzuki ’859, Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. A POSITA would have recognized that EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Klippstein’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, Masutani’s, De Jong’s, Yoshida ’529’s, Matsuura’s, Elliott’s, Yun’s, Cho’s, DeCusatis’s, Iue’s, and Ishihara’s disclosure of systems that generate stereoscopic 3D data for transmission across an interface according to signal information received from a sink device would have been useful in in systems that transmit image data for display, so that stereoscopic 3D image data may be provided in addition to other types of image data without reconfiguring the interface. Accordingly, a POSITA

would have been motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Masutani, De Jong, Yoshida '529, Matsuura, Elliott, Yun, Cho, DeCusatis, Iue, and Ishihara with the one or more additional references Suzuki '859, Takada '289, Newton '428, Hibino, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate transmission of stereoscopic 3D data over an existing interface so that users can watch stereoscopic 3D content. Making these combinations would have been straightforward because systems and techniques for generating stereoscopic 3D data for transmission across an interface according to signal information received from a sink device are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and amount to using known techniques for sending signaling information between source and sink devices in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Takada '289, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Ito, Klippstein, Kaneko, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Elliott, Yun, Glen, Cho, DeCusatis, Iue, and Ishihara. A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Elliott, and Yun disclose systems and techniques for demultiplexing stereoscopic image data according to the capabilities of the source device that may be used in the systems that transmit image data disclosed in Suzuki '859, Takada '289, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-

1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System and the MPEG-C Part 3 Specification And Products. A POSITA would have recognized that EEDID-A1's, EEDID-A2's, MCCS-3.0's, Ito's, De Jong's, Masutani's, Klippstein's, Kaneko's, Hiroya's, Ha's, Nelson's, Funke's, Yoshida '529's, Matsuura's, Elliott's, Yun's, Glen's, Cho's, DeCusatis's, Iue's, and Ishihara's disclosure of systems that demultiplex stereoscopic image data according to the capabilities of the source device would be useful in systems that receive image data for display, so that stereoscopic 3D data may be processed for display in addition to other types of data, and accordingly would be motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Elliott, Yun, Glen, Cho, DeCusatis, Iue, and Ishihara with the one or more of Suzuki '859, Takada '289, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate processing stereoscopic 3D data. Making these combinations would have been straightforward because systems and techniques for de-multiplexing stereoscopic image data according to the capabilities of the source device are readily adaptable to systems that transmit and receive image data across an interface, and amount to using known techniques for processing multiplexed data in predictable ways.

As a further example, a POSITA would have been motivated to combine Newton '428, Hibino, Takayama, the Philips System, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification And Products with EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Matsuura, Glen, DeCusatis, Iue, and Ishihara.

A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Matsuura, Glen, DeCusatis, Iue, and Ishihara disclose systems and techniques for transmitting main image data along with other image components, such as stereoscopic image components, within the existing capacity of an interface such as HDMI, which may be used in systems that transmit 3D image data across the interfaces disclosed in Newton '428, Hibino, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. A POSITA would have recognized that EEDID-A1's, EEDID-A2's, MCCS-3.0's, Ito's, De Jong's, Masutani's, Klippstein's, Kaneko's, Hiroya's, Ha's, Nelson's, Funke's, Matsuura's, Glen's, DeCusatis's, Iue's, and Ishihara's disclosure of using the existing capacity of an interface to transmit both main image data and image components, such as stereoscopic image components, would be useful in systems that transmit 3D image data for display, and accordingly would have been motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Kaneko, Hiroya, Ha, Nelson, Itoi, Funke, Matsuura, Glen, DeCusatis, Iue, and Ishihara with the one or more additional references Newton '428, Hibino, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products to facilitate transmitting 3D data over an existing interface so that users can watch 3D content without reconfiguring the interface. Making these combinations would have been straightforward because systems and techniques for transmitting main image data along with other image components, such as stereoscopic image components, over the existing capacity of an interface are readily adaptable

to systems with interfaces for transmitting image data, and amount to using known techniques for utilizing the data capacity of an interface in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Takada '642, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, DisplayPort-1.0, Draft-DP1.1a, the TI DLP 3DTV System, the Philips System, and the Sharp System with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Tu, Glen, Cho, and DeCusatis. A POSITA would have been motivated to combine these references because EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Tu, Glen, Cho, and DeCusatis disclose systems and techniques for sending signaling information to the sink device identifying the mode of the formatter, such as a 2D or stereoscopic 3D mode, and the characteristics of the stereoscopic 3D data, such as left and right eye data or depth information, which may be used in the systems that transmit and receive image data disclosed in Suzuki '859, Takada '642, Takada '277, Takayama, Suzuki '130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.1, the TI DLP 3DTV System, the Philips System, and the Sharp System. A POSITA would have recognized that EEDID-A1's, EEDID-A2's, MCCS-3.0's, Ito's, De Jong's, Masutani's, Klippstein's, Hiroya's, Ha's, Nelson's, Funke's, Yoshida '529's, Matsuura's, Tu's, Glen's, Cho's, and DeCusatis's disclosure of signaling the formatter's mode and characteristics of the stereoscopic 3D data would have been useful in systems that transmit and receive image data so that the sink device can determine what type of data is being received and the format of the data, and accordingly would be motivated to combine EEDID-A1, EEDID-A2, MCCS-3.0, Ito, De Jong, Masutani, Klippstein, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida '529, Matsuura, Tu, Glen, Cho, and DeCusatis with the one or more additional references Suzuki '859, Takada '642, Takada

’277, Takayama, Suzuki ’130A, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, the TI DLP 3DTV System, the Philips System, and the Sharp System to facilitate transmitting, processing, and displaying different types of image content. Making these combinations would have been straightforward because systems and techniques for sending signaling information to the sink device identifying the mode of the formatter and the characteristics of the stereoscopic 3D data are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and would amount to using known techniques for sending signaling information between source and sink devices in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Newton ’428, Takayama, Suzuki ’130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Takada ’277, DeCusatis, Nelson, Tu, Glen, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products with each other. A POSITA would be motivated to combine these references because the references disclose techniques applicable to transmitting image data across the standardized interfaces, including HDMI, DVI, DisplayPort, and/or USB, and provide techniques for improving the transmission of image data across these interfaces, such as by sending stereoscopic 3D data in the form of 2D information and a depth map or signaling information identifying whether the image data is formatted in a 2D or 3D mode and the characteristics of the image data. A POSITA would have had a reasonable expectation of success with combining these references because these techniques relate to transmitting image data across the standardized interfaces.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Tu, and Yun with each other. A POSITA would be motivated to combine Suzuki ’859 and Tu because

Suzuki ’859 provides implementation details regarding an HDMI interface and Tu uses an HDMI interface to transmit data between a source and sink device. A POSITA would have been further motivated to supplement Tu’s disclosure of using back-channel communications to operate the source device by using Yun’s back-channel information to control whether the source device operates in a 2D or 3D mode. A POSITA would have a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Philips System, Suzuki ’859, and Yun with each other. A POSITA would have been motivated to combine the Philips System and Suzuki ’859 because the Philips System discloses transmitting stereoscopic image data over a standardized interface, and Suzuki ’859 discloses implementation details for multiplexing and transmitting both 2D image data and stereoscopic 3D data over a standardized interface that facilitates transmission in the Philips System. A POSITA would have been further motivated to supplement the combination of the Philips System and Suzuki ’859 with Yun, which also addresses transmitting video data and describes using back-channel information to determine whether the source device should operate in a 2D or stereoscopic 3D mode. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Philips System, Takada ’277, and Glen with each other. A POSITA would have been motivated to combine the Philips System with Takada ’277 because the Philips System discloses transmitting

stereoscopic image data over a standardized interface, and Takada ’277 discloses a technique for transmitting 2D and depth information, such as a depth signal, over a conventional transmission interface by filling unused portions of the interface’s capacity with depth information, which facilitates transmission in the Philips System. A POSITA would have been further motivated to supplement the combination of the Philips System and Takada ’277 with Glen, which describes a system in which a sink device can send commands that cause a source device to use certain video processing algorithms, such as algorithms for processing 2D or stereoscopic 3D data. In addition or alternatively to Glen, a POSITA would have also been motivated to supplement the combination of the Philips System and Takada ’277 with Matsuura, which discloses that a source device can determine whether a sink device can receive a sub-signal in addition to pixel data by reading the VSDB of the EDID from the sink device, so that the system can set a 2D or stereoscopic 3D mode according to the information received from the sink device. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the claimed “signal information.” If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine the Sharp System, Suzuki ’859, and Yun with each other. A POSITA would also have been motivated to combine the Sharp System and Suzuki ’859 because the Sharp System discloses transmitting stereoscopic image data over a standardized interface, and Suzuki ’859 discloses implementation details for multiplexing and transmitting both 2D image data and stereoscopic 3D data over a standardized interface that facilitates transmission in the Sharp System. A POSITA would have been further

motivated to supplement the combination of the Sharp System and Suzuki ’859 with Yun, which also addresses transmitting video data and describes using back-channel information to determine whether the source device should operate in a 2D or stereoscopic 3D mode. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Sharp System, Takada ’277, and Glen with each other. POSITA would have been motivated to combine the Sharp System with Takada ’277 because the Sharp System discloses transmitting stereoscopic image data over a standardized interface, and Takada ’277 discloses a technique for transmitting stereoscopic image data over a conventional transmission interface by filling unused portions of the interface’s capacity with stereoscopic image data, such as depth information, which facilitates transmission in the Sharp System. A POSITA would have been further motivated to supplement the combination of the Sharp System and Takada ’277 with Glen, which describes a system in which a sink device can send commands that cause a source device to use certain video processing algorithms, such as algorithms for processing 2D or stereoscopic 3D data. In addition or alternatively to Glen, a POSITA would have also been motivated to supplement the combination of the Sharp System and Takada ’277 with Matsuura, which discloses that a source device can determine whether a sink device can receive a sub-signal in addition to pixel data by reading the VSDB of the EDID from the sink device, so that the system can set a 2D or stereoscopic 3D mode according to the information received from the sink device. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in

predictable ways. Additionally, General Video appears to allege that the EDID is the claimed "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine HDMI-1.3, EEDID-A2, and optionally Kaneko with each other. A POSITA would have been motivated to combine HDMI-1.3 and EEDID-A2 because HDMI-1.3 describes "HDMI Sources are expected to read the Sink's E-EDID and to deliver only the audio and video formats that are supported by the Sink." HDMI-1.3 at section 8.1. HDMI-1.3 lists Enhanced EDID standards by reference as one of "normative provisions of [HDMI 1.3]" standard, indicating that HDMI 1.3 incorporated E-EDID standards by reference. *See, e.g.,* HDMI-1.3 at section 1.2. Therefore, a POSITA would have been motivated to supplement HDMI-1.3's description of formatting image data in accordance with the non-stereo 2D mode and stereoscopic 3D mode that EEDID-A2 discloses. *See, e.g*., EEDID-A2 at Tables 3.22. HDMI-1.3 further discloses "HDMI Sinks are expected to detect InfoFrames and to process the received audio and video data appropriately." HDMI-1.3 at section 8.1. A POSITA would have been motivated to implement EEDID-A2's teaching of 2D or 3D mode and characteristics of the 3D data elements in HDMI-1.3's InfoFrame to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have been motivated to further combine Kaneko with HDMI-1.3 and EEDID-A2. HDMI-1.3 describes the HDMI interface supports color depths up to 48 bits per pixel. *See, e.g*., HDMI-1.3 at section 6.2.4. Kaneko provides examples of formatting stereoscopic images so that they can be transmitted within HDMI-1.3's 48 bits limit. For example, Kaneko discloses that a stereoscopic image can be transmitted either as left/right-eye images at 48 bits or

as depth/2D image at 32 bits. *See, e.g.*, Kaneko at [0009]. Therefore, a POSITA would have found it obvious to format the image data according to Kaneko's description. This is also consistent with EEDID-A2's disclosure of transmitting stereoscopic image data as left/right-eye images. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the alleged "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine HDMI-1.3, EEDID-A2, Ito, and optionally Kaneko with each other. In addition to the motivation to combine HDMI-1.3, EEDID-A2 and Kaneko discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that EEDID-A2 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in HDMI-1.3's InfoFrame to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the claimed "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine HDMI-1.3, MCCS-3.0, and optionally Ito and/or Kaneko with each other. A POSITA would have been motivated to combine HDMI-1.3 and MCCS-3.0 because MCCS-3.0 discloses "[t]he purpose of this standard is to define a universal set of commands used to control the screen settings of displays which can be used within any communication protocol established between the host and display." *See, e.g.,* MCCS-3.0 at p. 1. MCCS-3.0 also lists "HDMI interface" as an example of communication interface that MCCS standard can be used with. *See, e.g.,* MCCS-3.0 at section 1.1. HDMI-1.3 further discloses "HDMI Sinks are expected to detect InfoFrames and to process the received audio and video data appropriately." HDMI-1.3 at section 8.1. Relatedly, Ito also discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. Therefore, a POSITA would have been motivated to implement MCCS-3.0 and/or Ito's teaching of 2D or 3D mode and characteristics of the 3D data elements in HDMI-1.3's InfoFrame to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have been motivated to further combine Kaneko with HDMI-1.3 and MCCS-3.0. HDMI-1.3 describes the HDMI interface supports color depths up to 48 bits per pixel. *See, e.g*., HDMI-1.3 at section 6.2.4. Kaneko provides examples of formatting stereoscopic images so that they can be transmitted within HDMI-1.3's 48 bits limit. For example, Kaneko discloses that a stereoscopic image can be transmitted either as left/right-eye images at 48 bits or as depth/2D image at 32 bits. *See, e.g*., Kaneko at [0009]. Therefore, a POSITA would have found it obvious to format the image data according to Kaneko's description. This is also consistent with

MCCS-3.0's disclosure of transmitting stereoscopic image data as left/right-eye images. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine HDMI-1.3, MCCS-3.0, Ito, and optionally Kaneko with each other. In addition to the motivation to combine HDMI-1.3, MCCS-3.0, and Kaneko discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in HDMI-1.3's InfoFrame to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0, EEDID-A2, and optionally Kaneko with each other. A POSITA would have been motivated to combine DisplayPort-1.0 and EEDID-A2 because DisplayPort-1.0 describes "The Stream Source Policy Maker, before transport initiation, shall take the following actions: Read EDID from the Sink Device. Set stream attributes for Main Stream attribute data and CEA 861-C InfoFrame generation." *See, e.g.*, DisplayPort-1.0 at section 2.5.1; *see also* section 5.1.1.1 ("In determining the colorimetry format, the Source Device shall check the capability of the Sink Device via an

EDID read); section 5.2.1 ("A Sink Device shall describe its capabilities (supported Video Colorimetry Formats, Video Timing Formats and Audio Formats) in the base EDID, the CEA-861 Timing Extension Block (optional)."). DisplayPort-1.0 lists Enhanced EDID standards by reference as one of "References," indicating that DisplayPort-1.0 incorporated E-EDID standards by reference. *See, e.g.,* DisplayPort-1.0 at section 1.5. Therefore, a POSITA would have been motivated to supplement DisplayPort-1.0's description of formatting image data in accordance with the non-stereo 2D mode and stereoscopic 3D mode that EEDID-A2 discloses. *See, e.g*., EEDID-A2 at Tables 3.22. DisplayPort-1.0 further discloses "Main Stream Attribute data . . . are transported for the reproduction of the main video stream by the Sink." DisplayPort-1.0 at section 2.2.4; *see also* section 1.4 ("Main Stream Attributes: Attributes describing the main video stream format in terms of geometry and color format. Inserted once per video frame during the video blanking period. Used by DisplayPort receiver for reconstructing the stream"). A POSITA would have been motivated to implement EEDID-A2's teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.0's Main Stream Attributes to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.0 at sections 2.2.4, 1.4. A POSITA would have been motivated to further combine Kaneko with DisplayPort-1.0 and EEDID-A2. DisplayPort-1.0 describes the DisplayPort interface supports color depths up to 48 bits per pixel. *See, e.g*., DisplayPort-1.0 at section 2.2.1.2.5. Kaneko provides examples of formatting stereoscopic images so that they can be transmitted within DisplayPort-1.0's 48 bits limit. For example, Kaneko discloses that a stereoscopic image can be transmitted either as left/right-eye images at 48 bits or as depth/2D image at 32 bits. *See, e.g*., Kaneko at [0009]. Therefore, a POSITA would have found it obvious to format the image data according to Kaneko's description. This is also consistent with EEDID-A2's disclosure of transmitting stereoscopic image

data as left/right-eye images. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the claimed "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0, EEDID-A2, Ito, and optionally Kaneko with each other. In addition to the motivation to combine Display-1.0, EEDID-A2 and Kaneko discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that EEDID-A2 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in HDMI-1.3's InfoFrame to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the claimed "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0, MCCS-3.0, and optionally Ito and/or Kaneko with each other. A POSITA would have been motivated to combine DisplayPort-1.0 and MCCS-3.0 because MCCS-3.0 discloses "[t]he purpose

of this standard is to define a universal set of commands used to control the screen settings of displays which can be used within any communication protocol established between the host and display." *See, e.g.,* MCCS-3.0 at p. 1. DisplayPort-1.0 also lists MCCS standards as one of the "References," indicating DisplayPort-1.0 incorporates MCCS standards, *e.g*., MCCS-3.0, by reference. DisplayPort-1.0 at section 1.5. Relatedly, Ito also discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. A POSITA would have been motivated to implement MCCS-3.0 and/or Ito's teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.0's Main Stream Attributes to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.0 at sections 2.2.4, 1.4. A POSITA would have been motivated to further combine Kaneko with DisplayPort-1.0 and MCCS-3.0. DisplayPort-1.0 describes the DisplayPort-1.0 interface supports color depths up to 48 bits per pixel. *See, e.g*., DisplayPort-1.0 at section 2.2.1.2.5. Kaneko provides examples of formatting stereoscopic images so that they can be transmitted within DisplayPort-1.0's 48 bits limit. For example, Kaneko discloses that a stereoscopic image can be transmitted either as left/right-eye images at 48 bits or as depth/2D image at 32 bits. *See, e.g*., Kaneko at [0009]. Therefore, a POSITA would have found it obvious to format the image data according to Kaneko's description. This is also consistent with MCCS-3.0's disclosure of transmitting stereoscopic image data as left/right-eye images. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0, Ito, and optionally Kaneko with each other. In addition to the motivation to combine for DisplayPort-1.0 and Kaneko discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data. A POSITA would have been motivated to implement Ito's teaching of the 3D information in DisplayPort-1.0's Main Stream Attributes to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.0 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, EEDID-A2, and optionally Kaneko with each other. A POSITA would have been motivated to combine DisplayPort-1.1 and EEDID-A2 because DisplayPort-1.1 describes "The Stream Source Policy Maker, before transport initiation, must take the following actions: Read EDID from the Sink Device. Set stream attributes for Main Stream attribute data and CEA 861-C InfoFrame generation." *See, e.g.*, DisplayPort-1.1 at section 2.5.1; *see also* section 5.1.1.1 ("In determining the colorimetry format, the Source Device must check the capability of the Sink Device via an EDID read); section 5.2.1 ("A Sink Device must describe its capabilities (supported Video Colorimetry Formats, Video Timing Formats and Audio Formats) in the base EDID, the CEA-861 Timing Extension Block (optional)."). DisplayPort-1.1 lists EEDID-A2 as one of "Reference Documents," indicating that DisplayPort-1.1 incorporated EEDID-A2 by reference. *See, e.g.,* DisplayPort-1.1 at section 1.5. Therefore, a POSITA would have been motivated to supplement DisplayPort-1.1's description of formatting image data in accordance with the non-stereo 2D mode

and stereoscopic 3D mode that EEDID-A2 discloses. *See, e.g.*, EEDID-A2 at Tables 3.22. DisplayPort-1.1 further discloses "Main Stream Attribute data . . . are transported for the reproduction of the main video stream by the Sink." DisplayPort-1.0 at section 2.2.4; *see also* section 1.4 ("Main Stream Attributes: Attributes describing the main video stream format in terms of geometry and color format. Inserted once per video frame during the video blanking period. Used by DisplayPort receiver for reconstructing the stream"). A POSITA would have been motivated to implement EEDID-A2's teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.1's Main Stream Attributes to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. In addition, a POSITA would have been motivated to further combine Kaneko with DisplayPort-1.1 and EEDID-A2. DisplayPort-1.1 describes the DisplayPort interface supports color depths up to 48 bits per pixel. *See, e.g.*, DisplayPort-1.1 at section 2.2.1.3.5. Kaneko provides examples of formatting stereoscopic images so that they can be transmitted within DisplayPort-1.1's 48 bits limit. For example, Kaneko discloses that a stereoscopic image can be transmitted either as left/right-eye images at 48 bits or as depth/2D image at 32 bits. *See, e.g.*, Kaneko at [0009]. Therefore, a POSITA would have found it obvious to format the image data according to Kaneko's description. This is also consistent with EEDID-A2's disclosure of transmitting stereoscopic image data as left/right-eye images. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the claimed "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, EEDID-A2, Ito, and optionally Kaneko with each other. In addition to the motivation to combine Display-1.1, EEDID-A2 and Kaneko discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that EEDID-A2 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in DisplayPort-1.1's Main Stream Attributes to satisfy DisplayPort-1.1's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways. Additionally, General Video appears to allege that the EDID is the claimed "signal information." If that interpretation of the claims is correct, then the claims are invalid over this combination.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, MCCS-3.0, and optionally Ito and/or Kaneko with each other. A POSITA would have been motivated to combine DisplayPort-1.1 and MCCS-3.0 because MCCS-3.0 discloses "[t]he purpose of this standard is to define a universal set of commands used to control the screen settings of displays which can be used within any communication protocol established between the host and display." *See, e.g.,* MCCS-3.0 at p. 1. DisplayPort-1.1 also lists MCCS-3.0 as one of the "References," indicating DisplayPort-1.0 incorporates MCCS-3.0, by reference. DisplayPort-1.1 at section 1.5. Relatedly, Ito also discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is

consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. A POSITA would have been motivated to implement MCCS-3.0 and/or Ito's teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.1's Main Stream Attributes to satisfy DisplayPort-1.1's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. In addition, a POSITA would have been motivated to further combine Kaneko with DisplayPort-1.1 and MCCS-3.0. DisplayPort-1.1 describes the DisplayPort-1.1 interface supports color depths up to 48 bits per pixel. *See, e.g.*, DisplayPort-1.1 at section 2.2.1.3.5. Kaneko provides examples of formatting stereoscopic images so that they can be transmitted within DisplayPort-1.0's 48 bits limit. For example, Kaneko discloses that a stereoscopic image can be transmitted either as left/right-eye images at 48 bits or as depth/2D image at 32 bits. *See, e.g.*, Kaneko at [0009]. Therefore, a POSITA would have found it obvious to format the image data according to Kaneko's description. This is also consistent with MCCS-3.0's disclosure of transmitting stereoscopic image data as left/right-eye images. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, Ito, and optionally Kaneko with each other. In addition to the motivation to combine for DisplayPort-1.1 and Kaneko discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data. A POSITA would have been motivated to implement Ito's teaching of the 3D information in DisplayPort-1.1's Main Stream Attributes to satisfy DisplayPort-1.1's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. A

POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, and Draft-DP1.1a. On information and belief, the objective of Draft-DP1.1a is to "correct errata items in, and add clarifications to, DisplayPort Standard 1.1." DisplayPort-1.1a at p.1. A POSITA would have been motivated to implement Draft-DP1.1a's teaching in DisplayPort-1.1 to clarify DisplayPort-1.1's implementation, including, *e.g.*, Main Stream Attributes. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to DisplayPort standard.

E. The '786 Patent

Plaintiff alleges that HP infringes claims 1 and 13 of the '786 Patent. HP contends that these claims (collectively, "the Asserted Claims of the '786 Patent") are invalid.

1. Identification of Prior Art: P.R. 3-3(a)

Pursuant to Patent Rule 3-3 and subject to HP's reservations of rights in these Invalidity Contentions, HP asserts that at least the prior art listed below, individually or in combination, invalidates the Asserted Claims of the '786 Patent. Exhibits 786-A through 786-O provide detailed claim charts showing where each claim limitation may be found in certain references listed below, either expressly or inherently in the larger context of the passage, or inherently as the reference as a whole would be understood by a person having ordinary skill in the art. For those references for which detailed claim charts are not provided in Exhibits 786-A through 786-O, those additional prior art references are otherwise pertinent to the invalidity of the '786 Patent, either alone or in combination with other references.

The prior art references, systems, and products listed below and in the accompanying claim chart exhibits may be relied upon for certain limitations, state of the art, and background of the art; indicia of obviousness; as evidence of the level of skill in the art at the time of the filing of the Patents-in-Suit; and/or in support of assertions that it is proper to combine certain prior art references in certain ways.

Defendant also incorporates by reference each and every prior art reference of record in the prosecution of the Patents-in-Suit and patents or patent applications related to the Patents-in-Suit, the prior art referred to in the specifications of the Patents-in-Suit, as well as the prior art identified in any USPTO proceedings involving any of the Patents-in-Suit.

a. Prior Art Patents, Patent Applications, and Patent Publications

HP incorporates the prior art patents, patent applications, and patent publications identified in Section V.D.1.a *supra*.

b. Prior Art Publications

HP incorporates the prior art publications identified in Section V.D.1.b *supra*.

c. Prior Art Systems

HP incorporates the prior art systems identified in Section V.D.1.c *supra*.

d. Bases for Anticipation and/or Obviousness

Each prior art reference identified in Exhibits 786-A through 786-O expressly, implicitly, or inherently anticipates and/or renders obvious the Asserted Claims of the ’786 Patent, either alone or in combination with other prior art references (*e.g.*, the references identified in Exhibits 786-A through 786-O or other references identified above) or the knowledge of the POSITA at the time of the alleged invention. Each of the prior art references included in Exhibits 786-A through 786-O can be combined with any other prior art reference in Exhibits 786-A through 786-O, or

identified above, to render obvious the Asserted Claims of the '786 Patent, and the examples of combinations below are intended for emphasis only.[13]

In the table below, HP identifies a non-exhaustive list of prior art references that, alone or in combination, anticipate and/or render obvious the Asserted Claims. Any prior art not identified, or any prior art combination not expressly identified in the table below in no way exhausts the types of combinations of references that would have naturally been considered as part of the exercise of ordinary skill by one skilled in the art.

Exhibit	Reference(s)
786-A	Suzuki '859 either alone or in combination with one or more of Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Takada '642, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-B	Takada '642 either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-C	Takada '289 either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-D	Newton '428 either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-E	Hibino either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-F	Takada '277 either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-G	Takayama either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-H	The Philips System either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-I	The Sharp System either alone or in combination with one or more of Suzuki '859, Tu, Lida, Yoshida '529, Matsuura, Elliott, Glen, Cho,

[13] For example, each of Suzuki, Takada '642, Takada '289, Newton '428, Hibino, Takada '277, Takayama, the Philips System, and the Sharp System may be combined with each other to render obvious the Asserted Claims of the '786 Patent.

Exhibit	Reference(s)
	DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-J	MPEG-C Part 3 Specification And Products either alone or in combination with one or more of Suzuki ’859, Tu, Lida, Yoshida ’529, Matsuura, Elliott, Glen, Cho, DeCusatis, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-K	HDMI-1.3 either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Mautani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, Draft-DP1.1a, and/or Takayama
786-L	DisplayPort-1.0 either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Mautani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, Draft-DP1.1a, and/or Takayama
786-M	DisplayPort-1.1 either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Mautani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, Draft-DP1.1a, and/or Takayama
786-N	Suzuki ’130A either alone or in combination with one or more of Yoshida ’529, Tu, Lida, Matsuura, Glen, Cho, DeCusatis, Elliott, Iue, Ishihara Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-O	TI DLP 3DTV System either alone or in combination with one or more of Yoshida ’529, Tu, Lida, Matsuura, Glen, Cho, DeCusatis, Elliott, Iue, Ishihara, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and/or De Jong
786-P	Draft-DP1.1a either alone or in combination with one or more of EEDID-A1, EEDID-A2, MCCS-3.0, Kaneko, Klippstein, Ito, De Jong, Mautani, Hiroya, Ha, Nelson, Itoi, Funke, Yoshida ’529, Tu, Glen, DeCusatis, Cho, Matsuura, Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Hibino, Takada ’277, Suzuki ’130A, and/or Takayama

The accompanying claim charts (Exhibits 786-A through 786-O) set forth example bases for anticipation and obviousness, identifying where each reference discloses, alone or in combination with other references, each limitation of the Asserted Claims of the ’786 Patent on a limitation-by-limitation basis. HP’s claim charts are exemplary and not exhaustive.

e. Obviousness Combinations

Subject to HP's reservation of rights, HP contends that all of the prior art references, as identified above and described in the charts attached as Exhibits 786-A through 786-O, by themselves anticipate the asserted claim in accordance with 35 U.S.C. § 102 and/or render the Asserted Claims of the '786 Patent obvious under 35 U.S.C. § 103, as more specifically noted in the attached charts.

The cited portions of the prior art references are examples and representative of the content of the prior art references and should be understood in the context of the reference as a whole, as understood by one of ordinary skill in the art. To the extent a cited prior art reference is deemed not to anticipate or render obvious a claim as noted in the attached charts for failing to teach or suggest one or more limitations of that claim, that claim would nonetheless have been obvious to one of ordinary skill in the art at the time of the invention by the combination of the cited prior art reference with one or more other prior art references and/or common knowledge disclosing the missing claim limitations. For example, any of the references listed above, to the extent it does not explicitly or inherently disclose any limitation, could be combined with any one or more of the other references listed above which discloses that limitation.

HP reserves the right to supplement the obviousness arguments using any references listed above, or any references that may become known to HP during the course of discovery. Further, the suggested obviousness combinations are in addition to HP's anticipation contentions and are not to be construed to suggest that any reference included in the combinations is not anticipatory on its own.

f. Motivation to Combine and Reasonable Expectation of Success

With respect to the '786 Patent, the prior art identified above non-exhaustively illustrates the scope and content of the prior art. As detailed in claim charts 786-A through 786-O, the prior

art included each limitation recited in the Asserted Claims of the ’786 Patent. To the extent a cited prior art reference is deemed not to anticipate a claim, the only difference between the claimed invention and the prior art is the lack of actual combination of the elements in a single prior art reference. However, for at least the reasons discussed above and the additional reasons discussed below, a POSITA would have been motivated to combine each of the above prior art references. A POSITA pertaining to the ’786 Patent at the relevant time would have been someone with a bachelor’s degree in computer science, computer engineering, electrical engineering, or equivalent training, and approximately two years’ experience working in video processing and would be knowledgeable regarding audio-visual communications and stereoscopic display techniques. Lack of work experience can be substituted for additional education, and vice versa.

A POSITA would have numerous motivations to combine each of the above-referenced prior art. For example, as the United States Supreme Court held in *KSR*, “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” 550 U.S. at 416. The Supreme Court further held that, “[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a POSITA can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . .” *Id.* at 417. Accordingly, a POSITA would have been motivated to combine or adapt known or familiar methods in the art.

The combinations of the prior art references identified above would have been obvious in view of: (1) the knowledge of persons of ordinary skill in the art; (2) the express, implied and

inherent teachings of the prior art, or the interrelated teachings of multiple prior art references; (3) the nature of the problem being solved; (4) the fact that they are combinations of known methods to yield predictable results; (5) the fact that they involve a simple substitution of one known, equivalent element for another to obtain predictable results; (6) known work in various technological fields that could be applied to the same or different technological fields based on design incentives or other market forces; (7) the existence of a known need or problem in the field of endeavor at the time of the invention(s); and/or (8) a teaching, suggestion, or motivation in the prior art generally. In addition, it would have been obvious to try combining the prior art references identified above because there were only a finite number of predictable solutions and/or because known work in one field of endeavor prompted variations based on predictable design incentives and/or market forces either in the same field or a different one. Furthermore, the combination of the prior art references identified above would have been obvious because the combination represents the known potential options with a reasonable expectation of success.

Indeed, to the extent the prior art references identified herein do not anticipate the Asserted Claims of the ’786 Patent, the limitations of these claims are merely obvious variations of the systems and methods disclosed in the various prior art references. As discussed below and in the prior art references, all of these were well-known, conventional technologies prior to the Asserted Claims of the ’786 Patent. The ’786 Patent does not purport to have invented any of these technologies; rather, the ’786 Patent simply tacked on these conventional prior art approaches to conventional and generic known prior techniques. As such, the Asserted Claims merely incorporate the knowledge of a POSITA. The mere amalgamation of such conventional technologies here is not inventive—it is simply combining or substituting well-known, conventional prior art elements according to known methods to yield predictable results.

For example, a person having ordinary skill in the art would have been motivated to combine the prior art identified in Exhibits 786-A through 786-O based on the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons having ordinary skill in the art. Each reference in Exhibits 786-A through 786-O discloses methods and systems transmitting and/or receiving image data, such as 2D and 3D stereoscopic image data, across an interface. The references identified in Exhibits 786-A through 786-O are analogous prior art to the subject matter of the Asserted Claims and are proper to combine. Because these prior art references exist within a single area (transmission and/or processing of image data across an interface), it would have been obvious for a POSITA to look from one piece of prior art to another to find any missing functionality they desired to implement, or to replace functionality in one prior art reference for that described in another reference. Therefore, these references provide interrelated teachings and one of ordinary skill would look to the concepts in any of these references when seeking to solve the problems purportedly addressed by the ’786 patent.

Combining the references identified herein and in Exhibits 786-A through 786-O, which address similar problems as explained above, would have been obvious and straightforward to a POSITA. *First*, the combinations represent no more than the use of known techniques according to known methods in the same ways to yield predictable results. For example, the references generally address the same field of transmitting and/or receiving image data, such as 2D and 3D stereoscopic image data, across an interface, and one of ordinary skill in the art would be motivated by such obvious considerations as enhancing the amount of data that could be transmitted or received over the interface. *Second*, the references themselves identify the known problems and provide known solutions to address those problems in the field. Indeed, the references identified herein and in Exhibits 786-A through 786-O demonstrate that there was, at the time of the alleged

invention, a finite number of identified, predictable solutions for enhancing the transmission and/or receipt of image data that persons of ordinary skill in the art would have known how to successfully combine, making the claimed invention obvious. *Third*, the combinations are motivated because a POSITA would have appreciated that they improve the systems in the prior art by providing further techniques to transmit and/or receive 2D and stereoscopic 3D data over an interface, including by providing techniques for formatting and processing image data in 2D and stereoscopic 3D modes, multiplexing 3D stereoscopic image components so the components may be transmitted over the existing capacity of an interface, and/or signaling whether a 2D or stereoscopic 3D mode is being used and the format of the stereoscopic 3D data. *Fourth*, because the problems and solutions were known in the field, the particular arrangements and combinations of references would have yielded predictable results. *Fifth*, a number of the references themselves provide express motivations that would have led a person of ordinary skill to their combination. For example, the references acknowledge that formatting image data in a 2D or stereoscopic 3D mode and formatting stereoscopic 3D data so that it may be transmitted over the existing capacity of an interface that typically transmits 2D data can be important.

Below, HP has provided several additional examples of the motivations that a POSITA would have had to combine certain of the prior art references in Exhibits 786-A through 786-O. The inclusion of certain example combinations herein does not exclude other combinations based on the claim charts attached hereto, as there are many possible combinations of the references listed herein, and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. Instead, in many instances where a particular contention calls for, or requires, combining references, any one of a number of references can be combined.

As one example, methods and systems that formatted image data for transmission across an interface from a source device to a sink device in either a 2D or stereoscopic 3D mode were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification And Products. For example, Suzuki '859 describes both transmission of "typical video data (specifically, video data not for three dimensional display)" and "video data transmission for three-dimensional display." Suzuki '859, [0053], [0068]. The '786 patent also concedes that "[s]chemes for conveying stereoscopic image data within the confines of existing display interfaces" were well-known, such as the Philips WOWvx system which transmitted both "[s]ub-frames [that] carrie[d] 2D image data and a second of the sub-frames [that] carrie[d] depth information." '786 patent, 1:61-2:4. These methods and systems included techniques for setting the formatter to operate in a 2D or stereoscopic 3D mode as disclosed by at least Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. *See, e.g.*, Exs. 786-A through786-O, at claim element 1(b). A person of ordinary skill would have been motivated to combine techniques for operating a formatter a 2D or 3D stereoscopic mode with references disclosing transmitting image data because doing so would allow the user to view both 2D and 3D stereoscopic content. A

POSITA would have had a reasonable expectation of success with combining these references because formatters operable to transmit 2D and stereoscopic 3D image data across an interface are readily adaptable to systems that transmit image data across an interface, and would amount to using known techniques for implementing multi-mode formatters in existing transmission interfaces in predictable ways.

As a further example, methods and systems that processed image data received across an interface at a sink device in either a 2D or stereoscopic 3D mode were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. For example, Suzuki '859 explains that "[t]ypical display processing for 2D display is performed" but "in the case where it is determined that the three-dimensional mode has been set, the video data for the left eye and the video data for the right eye are separated (or combined) and corresponding display processing for three-dimensional image is performed." Suzuki '859, [0065], [0066]. The '786 patent also concedes that "[s]chemes for conveying stereoscopic image data within the confines of existing display interfaces" were well-known, such as the Philips WOWvx system which, in the case of a 3D mode, "extracts depth data from the second sub-frame and creates a 3D image having a resolution of the first sub-frame." '786 patent, 1:61-2:8. These systems and methods included techniques for configuring the sink device to process the received image data in either a 2D or stereoscopic 3D mode as disclosed by at least Suzuki '859, Takada '289, Newton '428, Takada '277, Takayama, the Philips System,

HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. *See, e.g.*, Exs. 786-A through 786-O, at claim element 13(b). A POSITA would have been motivated to combine techniques for processing image data in a 2D or stereoscopic 3D mode with references disclosing receiving image data over an interface because doing so would allow sink devices to process both 2D and stereoscopic 3D data for users. Making these combinations would have been straightforward because processors operable to process 2D and stereoscopic 3D image data received from a source device are readily adaptable to systems that receive image data across an interface and would amount to using known techniques for implementing multi-mode processors in existing transmission interfaces in predictable ways.

As a further example, methods and systems that multiplexed and demultiplexed components of 3D stereoscopic image data were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '642, Takada '289, Hibino, Takada '277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. The '786 patent itself concedes that "[s]chemes for conveying stereoscopic image data within the confines of existing display interfaces" were well-known, such as the Philips WOWvx system which "divides the overall display frame into a number of separate regions where different data can be carried. The overall frame is divided into two sub-frames,

arranged side-by-side: a first of the sub-frames carries 2D image data and a second of the sub-frames carries depth information." '786 patent, 1:61-2:4. These systems and methods included techniques for multiplexing and demultiplexing left and right eye image data or 2D data and depth information as disclosed by at least Suzuki '859, Takada '642, Takada '289, Hibino, Takada '277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. *See, e.g.*, Exs. 786-A through786-O, at claim elements 1(d), 13(d). For example, a person of ordinary skill would have been motivated to combine techniques for multiplexing and demultiplexing components of 3D stereoscopic image data with references disclosing transmitting or receiving data over an interface so that stereoscopic 3D data may be transmitted and received across an existing interface that typically transmits 2D data, without needing to change the configuration of the interface. Making these combinations would have been straightforward because systems and techniques for multiplexing and de-multiplexing stereoscopic image data are readily adaptable to systems that transmit and receive image data across an interface, and amount to using known techniques for generating and processing multiplexed data in predictable ways using the existing configuration of the interface.

As a further example, methods and systems that transmitted signaling information informing a sink device indicating whether a 2D or stereoscopic 3D mode is being used and how the stereoscopic 3D data is multiplexed were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0,

DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. The '786 patent itself concedes that there were well-known methods for signaling a 3D mode and how the stereoscopic 3D data is multiplexed, such as via 2D and depth information, including through the use of conventional HDMI Data Island Packets. For example, "a WOWvx encoded image as described in the background section, comprises a 2D image, depth information and/or occlusion information already embedded into separate regions of a conventional image." '786 patent, 10:28-31. "In order to identify such a 3D image, an HDMI Data Island Packet (typically a General Control Packet, Auxiliary Video InfoFrame (AVI) packet or specifically designated InfoFrame Packet) indicates this method. The information in this Packet identifies: the current stereoscopic method (*e.g.*, 2D+Depth) being used; any information pertaining to this method which is required by the display." *Id.*, 10:39-47. These systems and methods included techniques for transmitting the format of stereoscopic 3D data, such as left eye data and right eye data or 2D data and depth information, as disclosed by at least Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Matsuura, Cho, DeCusatis, De Jong, Glen, Masutani, Yoshida '529, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. *See, e.g.*, Exs. 786-A through 786-O, at claim elements 1(e), 1(f), 13(e), 13(f). A person of ordinary skill would have been motivated to combine these techniques for signaling whether a 2D or stereoscopic 3D mode is being used and how the stereoscopic 3D data is multiplexed so that the sink device can determine the format and configuration of the received image data so it can

decode the received stereoscopic 3D data for display to a user. Making these combinations would have been straightforward because systems and techniques for signaling whether a 2D or stereoscopic 3D mode is being used and how the stereoscopic 3D data is multiplexed are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and amount to using known techniques for sending signaling information between source and sink devices in predictable ways.

As a further example, methods and systems that transmitted signaling information at intervals in streams of data elements as auxiliary data were well-known and within the skill of persons of ordinary skill in the art at the time of the alleged invention. *See, e.g.*, Suzuki '859, Takada '289, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki '130A, Newton '428, and the MPEG-C Part 3 Specification and Products. The '786 patent itself concedes there were well-known methods for transmitting signaling information at intervals in streams of data elements as auxiliary data, including through the use of Auxiliary Video InfoFrame (AVI) packets. For example, "a WOWvx encoded image as described in the background section, comprises a 2D image, depth information and/or occlusion information already embedded into separate regions of a conventional image." '786 patent, 10:28-31. "In order to identify such a 3D image, an HDMI Data Island Packet (typically a General Control Packet, Auxiliary Video InfoFrame (AVI) packet or specifically designated InfoFrame Packet) indicates this method. The information in this Packet identifies: the current stereoscopic method (e.g., 2D+Depth) being used; any information pertaining to this method which is required by the display." *Id.*, 10:39-47. These systems and methods included techniques for transmitting signaling information during intervals or as auxiliary data streams as disclosed by at least Suzuki '859, Takada '289, Newton '428, the MPEG-C Part 3 Specification and Products, and Suzuki '130A. *See, e.g.*, Exs. 786-A through 786-O, at claim

elements 1(g), 1(h), 13(g), 13(h). A person of ordinary skill would have been motivated to combine these techniques for transmitting signaling information at intervals in streams of data elements as auxiliary data so that the signaling information may be transmitted and received using the existing configuration of the interface. Making these combinations would have been straightforward because systems and techniques for transmitting signaling information at intervals in streams of data elements as auxiliary data are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and amount to using known techniques for sending signaling information between source and sink devices in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takada '277, Takayama, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki '130A, the TI DLP 3DTV System, the Philips System, the Sharp System, and the MPEG-C Part 3 Specification and Products with each other. A POSITA would have been motivated to combine these references because they all disclose features of and/or applicable to interfaces that transmit image information from a source device to a sink device. *See* Exs. 786-A through 786-O, at claim elements 1(pre)(i), 1(pre)(ii), 13(pre)(i), 13(pre)(ii). A POSITA would have recognized that Suzuki '859, Takada '642, Takada '289, Newton '428, Hibino, Takada '277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products include the same or similar types of interface parts that support transmitting pixel information between a source device and a sink device, and accordingly would be motivated to combine those references to improve the usability of the interfaces for transmitting both 2D and stereoscopic 3D data. A POSITA would have had a reasonable expectation of success with combining these references because they all describe

similar systems—*e.g.*, involving transmission of 2D and stereoscopic 3D data across an interface, formatting and processing the image data according to a 2D or stereoscopic 3D mode, and/or transmitting signaling information at intervals in streams of data elements as auxiliary data.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Takada ’277, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products with one or more of Yoshida ’529, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, Matsuura, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would be motivated to combine these references because Yoshida ’529, Tu, Lida, Glen, Cho, and DeCusatis disclose interface parts in source and/or sink devices for transmitting and/or processing image data, such as uncompressed pixel information, that can be used in the image data transmission systems disclosed in Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Takada ’277, the Philips System, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. A POSITA would have recognized that Yoshida ’529’s, Tu’s, Lida’s, Glen’s, Cho’s, EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Klippstein’s, Ito’s, Kaneko’s, De Jong’s, Glen’s, Masutani’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, and DeCusatis’s disclosure of interface parts for transmitting and/or processing image data would be useful in image data transmission systems, and accordingly would have been motivated to combine Yoshida ’529, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, Kaneko, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis with the one or more additional references Suzuki ’859, Takada ’642, Takada ’289, Newton ’428, Takada ’277, the Philips System, HDMI-1.3, DisplayPort-1.0,

DisplayPort-1.1, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products to facilitate the transmission and processing of image data, including uncompressed pixel information, between source and sink devices. Making these combinations would have been straightforward because dedicated interface parts are readily adaptable to systems that transmit and receive data over interfaces such as HDMI and would amount to using known interface part configurations in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’642, Takada ’289, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, and Takada ’277 with one or more of Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, or DeCusatis. A POSITA would have been motivated to combine these references because Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, Klippstein, Ito, De Jong, Glen, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, or DeCusatis disclose inputs for receiving image data, including from a transmission interface, which may be used to receive the image data disclosed in Suzuki ’859, Takada ’642, Takada ’289, and Takada ’277. A POSITA would recognize that Yoshida ’529’s, Matsuura’s, Elliott’s, Tu’s, Lida’s, Glen’s, Cho’s, EEDID-A1’s, EEDID-A2’s, Klippstein’s, Ito’s, De Jong’s, Masutani’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, or DeCusatis’s disclosure of inputs for receiving image data would be useful in systems that format, transmit, and receive image data across an interface, and accordingly would be motivated to combine Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, Suzuki ’130A, the TI DLP 3DTV System, or DeCusatis with the one or more additional references Suzuki ’859, Takada ’642, Takada ’289, and Takada ’277 to facilitate the inputting, formatting, transmitting, and

receiving of image data across an interface. Making these combinations would have been straightforward because inputs for receiving image data are readily adaptable to systems that already have interconnections for transporting image data and would amount to using known techniques and systems for data inputs in predictable ways.

As a further example, a POSITA would have been motivated to combine Takada ’642, Takada ’289, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, and Hibino with one or more of Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would have been motivated to combine these references because Yoshida ’529, Matsuura, Elliott, Tu, Glen, Cho, DeCusatis, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and Lida disclose formatters that format image data for transmission over an interface that are operable in both 2D and stereoscopic 3D modes that may be used in systems that transmit image data from source devices to sink devices, as disclosed in Takada ’642, Takada ’289, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, Suzuki ’859 ’130A, the TI DLP 3DTV System, and Hibino. A POSITA would have recognized that Yoshida ’529’s, Matsuura’s, Elliott’s, Tu’s, Lida’s, Glen’s, Cho’s, EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Klippstein’s, Ito’s, De Jong’s, Masutani’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, and DeCusatis’s disclosure of formatters operable in 2D and stereoscopic 3D modes would be useful in systems that transmit image data, such as 2D and stereoscopic 3D data, and accordingly would have been motivated to combine Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis with the one or more additional references Takada ’642, Takada ’289, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-

DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, and Hibino to facilitate formatting image data for transmission across an interface. Making these combinations would have been straightforward because formatters operable to transmit 2D and stereoscopic 3D image data across an interface are readily adaptable to systems that transmit image data across an interface and would have amounted to using known techniques for implementing multi-mode formatters in existing transmission interfaces in predictable ways.

As a further example, a POSITA would have been motivated to combine Takada ’642, HDMI-1.3, DisplayPort-1.1, DisplayPort-1.0, Draft-DP1.1a, Suzuki ’130A, the TI DLP 3DTV System, and Takada ’277 with one or more of Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would have been motivated to combine these references because Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis disclose components that process received image data and are operable in both 2D and stereoscopic 3D modes and may be used in systems that receive image data from a source device, as disclosed in Takada ’642 and Takada ’277. A POSITA would have recognized that Yoshida ’529’s, Matsuura’s, Elliott’s, Tu’s, Lida’s, Glen’s, Cho’s, EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Klippstein’s, Ito’s, De Jong’s, Masutani’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, and DeCusatis’s disclosure of processors operable in 2D and stereoscopic 3D modes would have been useful in systems that receive 2D data or stereoscopic 3D data from a source device, and accordingly would have been motivated to combine Yoshida ’529, Matsuura, Elliott, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis with Takada ’642, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0,

Suzuki ’130A, the TI DLP 3DTV System, and Takada ’277 to facilitate processing image data that has been received across an interface. Making these combinations would have been straightforward because processors operable to process 2D and stereoscopic 3D image data received from a source device are readily adaptable to systems that receive image data across an interface and would have amounted to using known techniques for implementing multi-mode processors in existing transmission interfaces in predictable ways.

As a further example, a POSITA would have been motivated to combine Takada ’642, Newton ’428, Hibino, Takada ’277, Takayama, the Philips System, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products with one or more of Yoshida ’529, Matsuura, Tu, Lida, Glen, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would have been motivated to combine these references because Yoshida ’529, Matsuura, Tu, Lida, Glen, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis disclose systems and techniques for generating and extracting 2D image data transmitted over an interface, which may be used in the systems transmitting and receiving image data disclosed in Takada ’642, Newton ’428, Hibino, Takada ’277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. A POSITA would have recognized that Yoshida ’529’s, Matsuura’s, Tu’s, Lida’s, Glen’s, EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Klippstein’s, Ito’s, De Jong’s, Masutani’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, and DeCusatis’s disclosure of systems that generate and extract 2D image data would have been useful in systems that transmit and receive image data for display, so that 2D image data may be provided in addition to other types of image data without reconfiguring the interface.

Accordingly, a POSITA would have been motivated to combine Yoshida ’529, Matsuura, Tu, Lida, Glen, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis with the one or more of Takada ’642, Newton ’428, Hibino, Takada ’277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products to facilitate transmission of 2D image data over an existing interface so that users can view 2D content. Making these combinations would have been straightforward because systems and techniques for generating and extracting 2D image data transmitted over an existing interface are readily adaptable to systems with interfaces for transmitting image data, and amount to using known techniques for utilizing the data capacity of an interface in predictable ways.

As a further example, a POSITA would have been motivated to combine Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki ’130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products with one or more of Yoshida ’529, Matsuura, Elliott, Cho, DeCusatis, Iue, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Kaneko, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and Ishihara. A POSITA would have been motivated to combine these references because Yoshida ’529, Matsuura, Elliott, Cho, DeCusatis, Iue, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Kaneko, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and Ishihara disclose systems and techniques for generating and multiplexing stereoscopic 3D data for transmission across an interface that may be used in systems that transmit image data, as disclosed in Takada ’289, Newton ’428, Hibino, Takada ’277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki ’130A, the TI

DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. A POSITA would have recognized that Yoshida '529's, Matsuura's, Elliott's, Cho's, DeCusatis's, Iue's, EEDID-A1's, EEDID-A2's, MCCS-3.0's, Klippstein's, Kaneko's, Ito's, De Jong's, Masutani's, Hiroya's, Ha's, Nelson's, Funke's, and Ishihara's disclosure of systems that generate and multiplex stereoscopic 3D data for transmission across an interface would be useful in systems that transmit image data for display so that stereoscopic 3D image data may be provided in addition to other types of image data without reconfiguring the interface. Accordingly, a POSITA would have been motivated to combine Yoshida '529, Matsuura, Elliott, Cho, DeCusatis, Iue, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Kaneko, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and Ishihara with the one or more additional references Takada '289, Newton '428, Hibino, Takada '277, Takayama, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products to facilitate transmission of stereoscopic 3D data over the interface so that users can view stereoscopic 3D content. Making these combinations would have been straightforward because systems and techniques for generating stereoscopic 3D data for transmission across an interface are readily adaptable to systems that already transmit image data between source and sink devices, and amount to using known techniques for generating and multiplexing stereoscopic 3D data for transmission across an interface in predictable ways.

As a further example, a POSITA would have been motivated to combine Takada '289, Newton '428, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products with one or more of Yoshida '529, Matsuura, Elliott, Cho, DeCusatis, Iue, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Kaneko, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi,

Funke, and Ishihara. A POSITA would have been motivated to combine these references because Yoshida '529, Matsuura, Elliott, Cho, DeCusatis, Iue, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Kaneko, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and Ishihara disclose systems and techniques for demultiplexing stereoscopic 3D image data that may be used in systems that receive stereoscopic 3D image data, as disclosed in Takada '289, Newton '428, the Philips System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products. A POSITA would have recognized that Yoshida '529's, Matsuura's, Elliott's, Cho's, DeCusatis's, Iue's, EEDID-A1's, EEDID-A2's, MCCS-3.0's, Klippstein's, Kaneko's, Ito's, De Jong's, Masutani's, Hiroya's, Ha's, Nelson's, Funke's, and Ishihara's disclosure of systems that demultiplex stereoscopic image data would be useful in systems that receive image data for display, so that stereoscopic 3D data may be processed for display in addition to other types of data, and accordingly would have been motivated to combine Yoshida '529, Matsuura, Elliott, Cho, DeCusatis, Iue, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Kaneko, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and Ishihara with the one or more additional references Takada '289, Newton '428, the Philips System, HDMI-1.3, DisplayPort-1.1, DisplayPort-1.0, Suzuki '130A, Draft-DP1.1a, the TI DLP 3DTV System, the Sharp System, and the MPEG-C Part 3 Specification and Products to facilitate processing stereoscopic 3D data. Making these combinations would have been straightforward because systems and techniques for de-multiplexing stereoscopic image data are readily adaptable to systems that transmit and receive image data across an interface, and amount to using known techniques for processing multiplexed data in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki ’859, Takada ’642, Newton ’428, Hibino, Takada ’277, the Philips System, the Sharp System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki ’130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification and Products with one or more of Yoshida ’529, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would have been motivated to combine these references because Yoshida ’529, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis disclose systems and techniques for sending signaling information to the sink device indicating whether a 2D or stereoscopic 3D mode is being used and how the stereoscopic 3D data is multiplexed which may be used in systems that transmit and receive image data, as disclosed in Takada ’642, Newton ’428, Hibino, Takada ’277, the Philips System, the Sharp System, Suzuki ’859, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki ’130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification and Products. A POSITA would have recognized that Yoshida ’529’s, Tu’s, Lida’s, Glen’s, Cho’s, EEDID-A1’s, EEDID-A2’s, MCCS-3.0’s, Klippstein’s, Ito’s, De Jong’s, Masutani’s, Hiroya’s, Ha’s, Nelson’s, Funke’s, and DeCusatis’s disclosure of indicating whether a 2D or stereoscopic 3D mode is being used and how the stereoscopic 3D data is multiplexed would be useful in systems that transmit and receive image data so that the sink device can determine the format and configuration of the received image data so it can decode the received stereoscopic 3D data for display to a user, and accordingly would have been motivated to combine Yoshida ’529, Tu, Lida, Glen, Cho, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis with the one or more additional references Takada ’642, Newton ’428, Hibino, Takada ’277, the Philips System, the

Sharp System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification and Products to facilitate transmitting, processing, and displaying different types of image content. Making these combinations would have been straightforward because systems and techniques for sending signaling information to the sink device indicating whether a 2D or stereoscopic 3D mode is being used and how the stereoscopic 3D data is multiplexed are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and would have amounted to using known techniques for sending signaling information between source and sink devices in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Takada '642, Hibino, Takada '277, Takayama, the Philips System, the Sharp System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification and Products with one or more additional references Yoshida '529, Cho, Matsuura, Elliott, Lida, Glen, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis. A POSITA would have been motivated to combine these references because Yoshida '529, Cho, Matsuura, Elliott, Lida, Glen, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis disclose systems and techniques for transmitting signaling information during intervals or as auxiliary data streams which may be used in systems that transmit and receive different types of image data, as disclosed in Suzuki '859, Takada '642, Hibino, Takada '277, Takayama, the Philips System, the Sharp System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification and Products. A POSITA would have recognized that Yoshida '529's, Cho's, Matsuura's, Elliott's, Lida's, Glen's, EEDID-A1's, EEDID-A2's, MCCS-3.0's, Klippstein's, Ito's, De Jong's,

Masutani's, Hiroya's, Ha's, Nelson's, Funke's, and DeCusatis's disclosure of transmitting signaling information during intervals or as auxiliary data streams would be useful in systems that transmit and receive different types of image data so that signaling information may be sent using the existing configuration of the interface, and accordingly would have been motivated to combine Yoshida '529, Cho, Matsuura, Elliott, Lida, Glen, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Ito, De Jong, Masutani, Hiroya, Ha, Nelson, Itoi, Funke, and DeCusatis with the one or more additional references Suzuki '859, Takada '642, Hibino, Takada '277, Takayama, the Philips System, the Sharp System, HDMI-1.3, DisplayPort-1.1, Draft-DP1.1a, DisplayPort-1.0, Suzuki '130A, the TI DLP 3DTV System, and the MPEG-C Part 3 Specification and Products to facilitate the transmission of signaling information in addition to main image data across the interface. Making these combinations would have been straightforward because systems and techniques for transmitting signaling information during intervals or as auxiliary data streams are readily adaptable to systems that already transmit data, such as image data, between source and sink devices, and would amount to using known techniques for sending information between source and sink devices in predictable ways.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Newton '428, Takayama, the Philips System, Suzuki '130A, HDMI-1.3, DisplayPort-1.0, DisplayPort-1.1, Draft-DP1.1a, the TI DLP 3DTV System, EEDID-A1, EEDID-A2, MCCS-3.0, Klippstein, Takada '277, DeCusatis, Nelson, Itoi, Tu, Glen, the Sharp System, and the MPEG-C Part 3 Specification And Products with each other. A POSITA would have been motivated to combine these references because the references disclose techniques applicable to transmitting image data across the standardized interfaces, including HDMI, DVI, DisplayPort, and/or USB, and provide techniques for improving the transmission of image data across these interfaces, such

as by sending stereoscopic 3D data in the form of 2D information and a depth map or signaling information identifying whether the image data is formatted in a 2D or 3D mode and the characteristics of the image data. A POSITA would have had a reasonable expectation of success with combining these references because these techniques relate to transmitting image data across the standardized interfaces.

As a further example, a POSITA would have been motivated to combine Suzuki '859, Tu, and Lida with each other. A POSITA would have been motivated to combine Suzuki '859 and Tu because Suzuki '859 provides implementation details regarding an HDMI interface and Tu uses an HDMI interface to transmit data between a source and sink device. A POSITA would have further been motivated to use Lida's InfoFrames, which the HDMI specification designed for use in transmitting information regarding video data, in the combination of Suzuki '859 and Tu, which features an HDMI interface for transmitting audio-visual data. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Philips System, Suzuki '859, and Lida with each other. A POSITA would have been motivated to combine the Philips System and Suzuki '859 because the Philips System discloses transmitting stereoscopic image data over a standardized interface, and Suzuki '859 discloses implementation details for multiplexing and transmitting both 2D image data and stereoscopic 3D data over a standardized interface that facilitates transmission in the Philips System. A POSITA would have been further motivated to supplement the combination of the Philips System and Suzuki '859 with Lida, which discloses transmitting packets comprising information that may describe the transmitted image

data in the combination of the Philips System and Suzuki ’859. In addition, or alternatively, to Lida, a POSITA would have also been motivated to supplement the combination of the Philips System and Suzuki ’859 with Takayama, which discloses that non-effective portions of an image signal such as blanking periods may be utilized to carry the depth component of a stereoscopic image, such as the stereoscopic components transmitted in the combination of the Philips System and Suzuki ’859. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Philips System, Takada ’277, and Takayama with each other. A POSITA would have been motivated to combine the Philips System with Takada ’277 because the Philips System discloses transmitting stereoscopic image data over a standardized interface, and Takada ’277 discloses a technique for transmitting 2D and depth information, such as a depth signal, over a conventional transmission interface by filling unused portions of the interface’s capacity with depth information, which facilitates transmission in the Philips System. A POSITA would have been further motivated to supplement the combination of the Philips System and Takada ’277 with Takayama, which discloses that non-effective portions of an image signal such as blanking periods may be utilized to carry the depth component of a stereoscopic image, such as the stereoscopic components transmitted in the combination of the Philips System and Takada ’277. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Sharp System, Suzuki ’859, and Lida with each other. A POSITA would have been motivated to combine the Sharp System and Suzuki ’859 because the Sharp System discloses transmitting stereoscopic image data over a standardized interface, and Suzuki ’859 discloses implementation details for multiplexing and transmitting both 2D image data and stereoscopic 3D data over a standardized interface that facilitates transmission in the Sharp System. A POSITA would have been further motivated to supplement the combination of the Sharp System and Suzuki ’859 with Lida, which discloses transmitting packets comprising information that may describe the transmitted image data in the combination of the Sharp System and Suzuki ’859. In addition, or alternatively, to Lida, a POSITA would have also been motivated to supplement the combination of the Sharp System and Suzuki ’859 with Takayama, which discloses that non-effective portions of an image signal such as blanking periods may be utilized to carry the depth component of a stereoscopic image, such as the stereoscopic components transmitted in the combination of the Sharp System and Suzuki ’859. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine the Sharp System, Takada ’277, and Takayama with each other. A POSITA would have been motivated to combine the Sharp System with Takada ’277 because the Sharp System discloses transmitting stereoscopic image data over a standardized interface, and Takada ’277 discloses a technique for transmitting stereoscopic image data over a conventional transmission interface by filling unused portions of the interface’s capacity with stereoscopic image information, such as depth information, which facilitates transmission in the Sharp System. A POSITA would have been further motivated to

supplement the combination of the Sharp System and Takada '277 with Takayama, which discloses that non-effective portions of an image signal such as blanking periods may be utilized to carry stereoscopic image signals. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine HDMI-1.3 and EEDID-A2. A POSITA would have been motivated to combine HDMI-1.3 and EEDID-A2 because HDMI-1.3 describes "HDMI Sources are expected to read the Sink's E-EDID and to deliver only the audio and video formats that are supported by the Sink." HDMI-1.3 at section 8.1. HDMI-1.3 lists Enhanced EDID standards by reference as one of "normative provisions of [HDMI 1.3]" standard, indicating that HDMI 1.3 incorporated E-EDID standards by reference. *See, e.g.,* HDMI-1.3 at section 1.2. Therefore, a POSITA would have been motivated to supplement HDMI-1.3's description of formatting image data in accordance with the non-stereo 2D mode and stereoscopic 3D mode that EEDID-A2 discloses. *See, e.g.*, EEDID-A2 at Tables 3.22. HDMI-1.3 further discloses "HDMI Sinks are expected to detect InfoFrames and to process the received audio and video data appropriately." HDMI-1.3 at section 8.1. A POSITA would have been motivated to implement EEDID-A2's teaching of 2D or 3D mode and characteristics of the 3D data elements in HDMI-1.3's InfoFrame as auxiliary data during intervals to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have had a reasonable expectation of success combining these references

because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine HDMI-1.3, EEDID-A2, and Ito with each other. In addition to the motivation to combine HDMI-1.3 and EEDID-A2 discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that EEDID-A2 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in HDMI-1.3's InfoFrame as auxiliary data during intervals to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine HDMI-1.3, MCCS-3.0, and optionally Ito. A POSITA would have been motivated to combine HDMI-1.3 and MCCS-3.0 because MCCS-3.0 discloses "[t]he purpose of this standard is to define a universal set of commands used to control the screen settings of displays which can be used within any communication protocol established between the host and display." *See, e.g.,* MCCS-3.0 at p. 1. MCCS-3.0 also lists "HDMI interface" as an example of communication interface that MCCS standard can be used with. *See, e.g.,* MCCS-3.0 at section 1.1. HDMI-1.3 further discloses "HDMI Sinks are expected to detect InfoFrames and to process the received audio and video data appropriately." HDMI-1.3 at section 8.1. Relatedly, Ito also discloses sending 3D information to

allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. Therefore, a POSITA would have been motivated to implement MCCS-3.0 and/or Ito's teaching of 2D or 3D mode and characteristics of the 3D data elements in HDMI-1.3's InfoFrame as auxiliary data during intervals to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine HDMI-1.3 and Ito. Related to HDMI-1.3's disclosure of InfoFrame discussed above, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data. A POSITA would have been motivated to implement Ito's teaching of the 3D information in HDMI-1.3's InfoFrame as auxiliary data during intervals to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0 and EEDID-A2. A POSITA would have been motivated to combine DisplayPort-1.0 and EEDID-A2 because DisplayPort-1.0 describes "The Stream Source Policy Maker, before transport

initiation, shall take the following actions: Read EDID from the Sink Device. Set stream attributes for Main Stream attribute data and CEA 861-C InfoFrame generation." *See, e.g*., DisplayPort-1.0 at section 2.5.1; *see also* section 5.1.1.1 ("In determining the colorimetry format, the Source Device shall check the capability of the Sink Device via an EDID read); section 5.2.1 ("A Sink Device shall describe its capabilities (supported Video Colorimetry Formats, Video Timing Formats and Audio Formats) in the base EDID, the CEA-861 Timing Extension Block (optional)."). DisplayPort-1.0 lists Enhanced EDID standards by reference as one of "References," indicating that DisplayPort-1.0 incorporated E-EDID standards by reference. *See, e.g.,* DisplayPort-1.0 at section 1.5. Therefore, a POSITA would have been motivated to supplement DisplayPort-1.0's description of formatting image data in accordance with the non-stereo 2D mode and stereoscopic 3D mode that EEDID-A2 discloses. *See, e.g*., EEDID-A2 at Tables 3.22. DisplayPort-1.0 further discloses "Main Stream Attribute data . . . are transported for the reproduction of the main video stream by the Sink." DisplayPort-1.0 at section 2.2.4; *see also* section 1.4 ("Main Stream Attributes: Attributes describing the main video stream format in terms of geometry and color format. Inserted once per video frame during the video blanking period. Used by DisplayPort receiver for reconstructing the stream"). A POSITA would have been motivated to implement EEDID-A2's teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.0's Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.0 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0, EEDID-A2, and Ito with each other. In addition to the motivation to combine Display-1.0 and EEDID-A2 discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that EEDID-A2 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in HDMI-1.3's InfoFrame as auxiliary data during intervals to satisfy HDMI-1.3's requirement that "[a] video format is sufficiently defined such that when it is received at the monitor, the monitor has enough information to properly display the video to the user." HDMI-1.3 at section 2.2. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0, MCCS-3.0 and optionally Ito. A POSITA would have been motivated to combine DisplayPort-1.0 and MCCS-3.0 because MCCS-3.0 discloses "[t]he purpose of this standard is to define a universal set of commands used to control the screen settings of displays which can be used within any communication protocol established between the host and display." *See, e.g.,* MCCS-3.0 at p. 1. DisplayPort-1.0 also lists MCCS standards as one of the "References," indicating DisplayPort-1.0 incorporates MCCS standards, *e.g.*, MCCS-3.0, by reference. DisplayPort-1.1 at section 1.5. Relatedly, Ito also discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. A POSITA would have been motivated to implement MCCS-3.0 and/or Ito's teaching of 2D or 3D mode and

characteristics of the 3D data elements in DisplayPort-1.0's Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.0 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.0 and Ito. Related to DisplayPort-1.1's disclosure of Main Stream Attributes discussed above, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data. A POSITA would have been motivated to implement Ito's teaching of the 3D information in DisplayPort-1.0's Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.0's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.0 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1 and EEDID-A2. A POSITA would have been motivated to combine DisplayPort-1.1 and EEDID-A2 because DisplayPort-1.1 describes "The Stream Source Policy Maker, before transport initiation, must take the following actions: Read EDID from the Sink Device. Set stream attributes for Main Stream attribute data and CEA 861-C InfoFrame generation." *See, e.g.*, DisplayPort-1.1 at section 2.5.1; *see also* section 5.1.1.1 ("In determining the colorimetry format, the Source Device must check the capability of the Sink Device via an EDID read); section 5.2.1 ("A Sink

Device must describe its capabilities (supported Video Colorimetry Formats, Video Timing Formats and Audio Formats) in the base EDID, the CEA-861 Timing Extension Block (optional).”). DisplayPort-1.1 lists EEDID-A2 as one of “Reference Documents,” indicating that DisplayPort-1.1 incorporated EEDID-A2 by reference. *See, e.g.,* DisplayPort-1.1 at section 1.5. Therefore, a POSITA would have been motivated to supplement DisplayPort-1.1’s description of formatting image data in accordance with the non-stereo 2D mode and stereoscopic 3D mode that EEDID-A2 discloses. *See, e.g*., EEDID-A2 at Tables 3.22. DisplayPort-1.1 further discloses “Main Stream Attribute data . . . are transported for the reproduction of the main video stream by the Sink.” DisplayPort-1.0 at section 2.2.4; *see also* section 1.4 (“Main Stream Attributes: Attributes describing the main video stream format in terms of geometry and color format. Inserted once per video frame during the video blanking period. Used by DisplayPort receiver for reconstructing the stream”). A POSITA would have been motivated to implement EEDID-A2’s teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.1’s Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.0’s requirement of “reproduction of the main video stream by the Sink.” DisplayPort-1.1 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, EEDID-A2 and Ito with each other. In addition to the motivation to combine Display-1.1 and EEDID-A2 discussed above, relatedly, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that

EEDID-A2 discloses. A POSITA would have been motivated to implement Ito's teaching of the 3D information in DisplayPort-1.1's Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.1's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, MCCS-3.0 and optionally Ito. A POSITA would have been motivated to combine DisplayPort-1.1 and MCCS-3.0 because MCCS-3.0 discloses "[t]he purpose of this standard is to define a universal set of commands used to control the screen settings of displays which can be used within any communication protocol established between the host and display." *See, e.g.,* MCCS-3.0 at p. 1. DisplayPort-1.1 also lists MCCS-3.0 as one of the "References," indicating DisplayPort-1.0 incorporates MCCS-3.0, by reference. DisplayPort-1.1 at section 1.5. Relatedly, Ito also discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data, which is consistent with the 2D/3D mode and characteristics of the 3D image data information that MCCS-3.0 discloses. A POSITA would have been motivated to implement MCCS-3.0 and/or Ito's teaching of 2D or 3D mode and characteristics of the 3D data elements in DisplayPort-1.1's Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.1's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an

interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1 and Ito. Related to DisplayPort-1.1's disclosure of Main Stream Attributes discussed above, Ito discloses sending 3D information to allow the sink device to determine 2D/3D mode and corresponding characteristics of the 3D image data. A POSITA would have been motivated to implement Ito's teaching of the 3D information in DisplayPort-1.1's Main Stream Attributes as auxiliary data during intervals to satisfy DisplayPort-1.1's requirement of "reproduction of the main video stream by the Sink." DisplayPort-1.1 at sections 2.2.4, 1.4. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to transmitting data over an interface and thus the combination amounts to using known techniques for data transmission in predictable ways.

As a further example, a POSITA would have been motivated to combine DisplayPort-1.1, and Draft-DP1.1a. On information and belief, the objective of Draft-DP1.1a is to "correct errata items in, and add clarifications to, DisplayPort Standard 1.1." DisplayPort-1.1a at p.1. A POSITA would have been motivated to implement Draft-DP1.1a's teaching in DisplayPort-1.1 to clarify DisplayPort-1.1's implementation, including, *e.g.*, Main Stream Attributes. A POSITA would have had a reasonable expectation of success combining these references because each reference relates to DisplayPort standard.

F. Prior art under Pre-AIA 35 U.S.C. § 102(f)

Discovery has only just recently begun, and inventor discovery is forthcoming. Based on limited discovery received to date, HP contends that the asserted claims are invalid under 35 U.S.C. § 102(f) and/or for failing to satisfy § 116 on the grounds that the named inventor of the Patents-in-Suit did not invent the subject matter claimed therein and/or improperly omitted an inventor. A

patent is invalid if more or fewer than the true inventors are named. Should HP obtain additional evidence, they will provide the name of the person(s) from whom and the circumstances under which the alleged invention or any part of it was derived.

For example, HP believes that one or more other people may have invented or contributed to the subject matter claimed in the Patents-in-Suit, whose subject matter qualifies as prior art under pre-AIA 35 U.S.C. § 102(f) against one or more of the Patent-in-Suits. HP may identify additional information describing additional persons, facts, and circumstances that may also demonstrate that the named inventors are not entitled to the Patents-in-Suit under pre-AIA 35 U.S.C. § 102(f) and/or failed to satisfy the requirements under § 116 such that the Asserted Claims of the Patents-in-Suit are invalid.

For example, with respect to the ’010 and ’786 patents, neither the listed inventor (Nicoll Burleigh Shepherd) nor the original assignee (Koninklijke Philips N.V.) was involved in developing at least the earliest asserted DisplayPort standard. Thus, the purported inventor is not entitled to these patents because “he did not himself invent the subject matter sought to be patented.” 35 U.S.C. § 102(f).

For example, with respect to the ’282 and ’437 patents, neither the listed inventors (Jim Lyle, Seung Ho Hwang, Jano Banks, Daniel Wolf, Eric Lee, Baegin Sun, or Albert M. Scalise) nor the original assignee (Silicon Image, Inc.) was involved in developing at least the earliest asserted DisplayPort standard. Thus, the purported inventors are not entitled to these patents because “he did not himself invent the subject matter sought to be patented.” 35 U.S.C. § 102(f).

Additionally, Plaintiff may have in its possession, custody, or control information related to or pertaining to prior art under pre-AIA 35 U.S.C. § 102(f) and/or information concerning the failure to satisfy § 116. HP will supplement these Invalidity Contentions if and when Plaintiff

produces such information, and HP has had the opportunity to obtain and analyze that information. HP contends that the Patents-in-Suit are invalid under pre-AIA 35 U.S.C. § 102(f) and/or § 116 in the event HP obtains evidence that the named inventor of any of the Patents-in-Suit did not invent (either together or in conjunction with other parties) the subject matter claimed therein and/or omitted a true inventor.

G. Prior art under Pre-AIA 35 U.S.C. § 102(g)

Each prior art patent, publication, or product identified above was either filed or issued (for patents), published (for publications), or known, used, offered for sale or sold (for disclosures, products, and/or systems) before the earliest priority date of the Patents-in-Suit. Additionally, each prior art patent, publication, or product identified above does not appear to have been abandoned, suppressed, or concealed, so that each such reference also constitutes evidence of prior invention pursuant to 35 U.S.C. § 102(g) to the extent that it is in the U.S. The persons or entities involved with each such invention include the named inventors on the above-identified patents, the authors listed on the above-identified publications, and the entities and individuals identified in connection with the above-identified products and systems. Plaintiff has not provided conception dates or evidence thereof earlier than the filing dates of the Patents-in-Suit or the alleged priority dates listed on the faces of the Patents-in-Suit. Nor has Plaintiff provided reduction to practice dates or evidence thereof and/or any purported diligence associated therewith. Should the Court permit Plaintiff to provide any of such evidence, HP reserves the right to assert that any of the prior art references identified in the sections above as pre-AIA 35 U.S.C. §102(a) prior art is also pre-AIA 35 U.S.C. §102(g) prior art. Investigation, analysis, and discovery are ongoing in this matter, and HP reserves the right to supplement this response as appropriate.

VI. PATENTABLE SUBJECT MATTER

HP further asserts that certain of the Asserted Patents are ineligible for patent protection under 35 U.S.C. § 101. To be patentable subject matter under § 101, a claim must be directed to one of four eligible subject matter categories: "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. "Claims that fall within one of the four subject matter categories may nevertheless be ineligible if they encompass laws of nature, physical phenomena, or abstract ideas." *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (citing *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980)). The Supreme Court established a two-step test for deciding the subject matter eligibility of claims under § 101. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014). First, the claims must be analyzed to determine whether they are drawn to one of the statutory exceptions. *Id.* Claims that invoke generic computer components instead of reciting specific improvements in computer capabilities are abstract under this first step. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016). Second, the elements of the claims must be viewed both individually and as an ordered combination to see if there is an "inventive concept." *Id.* The mere fact that a claim recites or implies that an abstract idea is implemented using a general-purpose computer does not supply an inventive concept necessary to satisfy § 101. *See Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1355 (Fed. Cir. 2016); *Alice*, 134 S. Ct. at 2357-59.

Based on HP's investigation to date and currently available information, the following patents are ineligible for patent protection.

A. The '437 Patent

The Asserted Claim of the '437 Patent is directed to ineligible subject matter under 35 U.S.C. § 101. More specifically the claim is invalid because it is directed to an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). As an initial matter, the identified

claim is generally directed to the abstract idea of encoding and transmitting information and content. *See RecogniCorp, LLC v. Nintendo Co.*, Ltd., 855 F.3d 1322, 1326 (Fed. Cir. 2017) ("This method reflects standard encoding and decoding, an abstract concept long utilized to transmit information."). *See also BuySAFE* 765 F.3d 1350, 1355 ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive."), *See also Intell. Ventures I LLC v. Cap. One Fin. Corp*., 850 F.3d 1332, 1341 (Fed. Cir. 2017) ("This method reflects standard encoding and decoding, an abstract concept long utilized to transmit information.").

Additionally, at least the following claim terms or phrases of the '437 Patent are routine and/or conventional are therefore directed to ineligible subject matter under 35 U.S.C. § 101 as indicated below:

Claim	Language
41	"a method for encoding data for transmission over a serial link"
41	"providing words of input data capable of being encoded as a conventional sequence of code words of a full code word set"
41	"generating a sequence of selected code words by encoding the input data, wherein each of the selected code words is a member of a robust subset of the full code word set, and the sequence of selected code words is less susceptible to inter-symbol interference during transmission over the link than would be the conventional sequence of code words"
41	"generating bursts of encoded control words by encoding control bits"
41	"transmitting over the link a first burst of the encoded control words between a first burst of the video code words and the burst of the selected code words, and a second burst of the encoded control words between the burst of the selected code words and a second burst of the video code words"

B. The ’010 Patent

The Asserted Claims of the ’010 Patent are directed to ineligible subject matter under 35 U.S.C. § 101. More specifically, the claims are invalid because they are directed to an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014). The identified claims are generally directed to the abstract idea of transmitting and receiving content. *See BuySAFE* 765 F.3d 1350, 1355 (“That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive.”). *See also Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1357 (Fed. Cir. 2023) (“The claims are directed to a method of receiving, displaying, converting, storing, and transmitting digital video ‘using result-based functional language.’”); *id.* (“The [] patent claims are directed to [] abstract ideas—displaying images, converting them into a format, transmitting them, and so on.”).

Additionally, at least the following claim terms or phrases of the ’010 Patent are routine and/or conventional and are therefore directed to ineligible subject matter under 35 U.S.C. § 101 as indicated below:

Claim	Language
1	“A digital display interface part, for use in a first audio-visual device, for supporting a digital display interface between the first audio-visual device and a second audio-visual device, the digital display interface having a known data carrying capacity for transmitting uncompressed pixel information”
1	“an input for receiving image data”
1	“a formatter arranged to format the data for transport over the interface”
1	“the interface part is arranged to send signaling information across the interface, the signaling information identifying which mode the formatter is using and characteristics of said steam of second data elements”
12	“A digital display interface part for use in an audio-visual device, said interface part supporting a digital display interface having a known

Claim	Language
	data carrying capacity between the audio-visual device and a second audio-visual device, and receiving uncompressed pixel information"
12	"an input for receiving formatted image data from the interface"
12	"a processor arranged to extract said image data"
12	"the interface part further arranged to receive signaling information across the interface, the signaling information identifying which of said first mode and said second mode is used and characteristics of said steam of second data elements"

C. The '786 Patent

The Asserted Claims of the '786 Patent are directed to ineligible subject matter under 35 U.S.C. § 101. More specifically, the claims are invalid because they are directed to an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). The identified claims are generally directed to the abstract idea of transmitting and receiving content. *See BuySAFE* 765 F.3d 1350, 1355 ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive."). *See also Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1357 (Fed. Cir. 2023) ("The claims are directed to a method of receiving, displaying, converting, storing, and transmitting digital video 'using result-based functional language.'"); *id.* ("The [] patent claims are directed to [] abstract ideas—displaying images, converting them into a format, transmitting them, and so on.").

Additionally, at least the following claim terms or phrases of the '786 Patent are routine and/or conventional and are therefore directed to ineligible subject matter under 35 U.S.C. § 101 as indicated below:

Claim	Language
1	"An interface part for a digital display, for use in a first audio-visual device for supporting a digital display transmission interface between

Claim	Language
	the first audio-visual device and a second audio-visual device, the interface for transmitting uncompressed pixel information"
1	"an input for receiving image data"
1	"a formatter configured to format the received image data for transport over a transmission interface"
1	"wherein the interface part is configured to send signaling information across the transmission interface, the signaling information identifying which mode the formatter is using"
1	"wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode"
1	"the signaling information being carried in the auxiliary data elements"
13	"An interface part for a digital display, for use in an audio-visual device for supporting a digital display transmission interface between a first audio-visual device and a second audio-visual device, the digital display interface for receiving uncompressed pixel information"
13	"an input for receiving formatted image data from the transmission interface"
13	"a processor arranged to extract image data"
13	"wherein the interface part is configured to receive signaling information across the transmission interface, the signaling information identifying which mode the formatter is using"
13	"wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode"
13	"the signaling information being carried in the auxiliary data elements"

D. The '282 Patent

The Asserted Claim of the '282 Patent is directed to ineligible subject matter under 35 U.S.C. § 101. More specifically the claim is invalid because it is directed to an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). As an initial matter, the identified claim is generally directed to the abstract idea of encoding and transmitting information and content. *See Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1357 (Fed. Cir. 2023)

("The claims are directed to a method of receiving, displaying, converting, storing, and transmitting digital video 'using result-based functional language.'"); *id.* ("The [] patent claims are directed to [] abstract ideas—displaying images, converting them into a format, transmitting them, and so on."); *see also RecogniCorp, LLC v. Nintendo Co.*, Ltd., 855 F.3d 1322, 1326 (Fed. Cir. 2017) ("This method reflects standard encoding and decoding, an abstract concept long utilized to transmit information."); *see also BuySAFE* 765 F.3d 1350, 1355 ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive.").

Additionally, at least the following claim terms or phrases of the '282 Patent are routine and/or conventional are therefore directed to ineligible subject matter under 35 U.S.C. § 101 as indicated below:

Claim	Language
1	"A method for bi-directional transmission of data between a source and a sink over a two-wire interface"
1	"re-mapping a data signal and a clock signal from a first local bus on the source into a different protocol signal"
1	"transmitting the different protocol signal from the source to the sink over the two-wire interface"
1	"re-mapping the different protocol signal back into the data signal and the clock signal for use on a second local bus on the sink"
1	"re-mapping the data signal and the clock signal from the second local bus into the different protocol signal"
1	"transmitting the different protocol signal from the sink to the source over the two-wire interface"

E. The '443 Patent

The Asserted Claims of the '443 Patent is directed to ineligible subject matter under 35 U.S.C. § 101. More specifically the claim is invalid because it is directed to an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). As an initial matter, the identified claim is generally directed to the abstract idea of encoding and transmitting information and

content. *See Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1357 (Fed. Cir. 2023) ("The claims are directed to a method of receiving, displaying, converting, storing, and transmitting digital video 'using result-based functional language.'"); *id.* ("The [] patent claims are directed to [] abstract ideas—displaying images, converting them into a format, transmitting them, and so on."); *see also RecogniCorp, LLC v. Nintendo Co.*, Ltd., 855 F.3d 1322, 1326 (Fed. Cir. 2017) ("This method reflects standard encoding and decoding, an abstract concept long utilized to transmit information."); *see also BuySAFE* 765 F.3d 1350, 1355 ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive.").

Additionally, at least the following claim terms or phrases of the '443 Patent are routine and/or conventional are therefore directed to ineligible subject matter under 35 U.S.C. § 101 as indicated below:

Claim	Language
7	"A method for transferring audio data and audio-related information, comprising:"
7	"a transmission step of transmitting the audio data and audio-related information associated with the audio data; and"
7	"a reception step of receiving the audio data and the audio-related information,"
7	"wherein the audio-related information includes monitor information indicating whether or not the audio data is capable of being monitored in the reception step."
9	"A method according to claim 7, further comprising a muting step of muting the audio data if the monitor information indicates that the audio data is not capable of being monitored in the reception step."

F. The '224 Patent

The Asserted Claims of the '224 Patent is directed to ineligible subject matter under 35 U.S.C. § 101. More specifically the claim is invalid because it is directed to an abstract idea. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). As an initial matter, the identified

claim is generally directed to the abstract idea of encoding and transmitting information and content. *See Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1357 (Fed. Cir. 2023) ("The claims are directed to a method of receiving, displaying, converting, storing, and transmitting digital video 'using result-based functional language.'"); *id.* ("The [] patent claims are directed to [] abstract ideas—displaying images, converting them into a format, transmitting them, and so on."); *see also RecogniCorp, LLC v. Nintendo Co.*, Ltd., 855 F.3d 1322, 1326 (Fed. Cir. 2017) ("This method reflects standard encoding and decoding, an abstract concept long utilized to transmit information."); *see also BuySAFE* 765 F.3d 1350, 1355 ("That a computer receives and sends the information over a network—with no further specification—is not even arguably inventive.").

Additionally, at least the following claim terms or phrases of the '224 Patent are routine and/or conventional are therefore directed to ineligible subject matter under 35 U.S.C. § 101 as indicated below:

Claim	Language
3	"A receiver for receiving audio data and audio-related information associated with the audio data, comprising:
3	"an analysis section operable to determine whether or not the audio data is capable of being monitored by the receiver,"
3	"wherein the audio-related information includes monitor information indicating whether or not the audio data is capable of being monitored by the receiver, and
3	"the analysis section determines whether or not the audio data is capable of being monitored by the receiver based on the monitor information.
5	"A receiver according to claim 3, wherein the audio data is muted if the monitor information indicates that the audio data is not capable of being monitored by the receiver."

VII. INVALIDITY UNDER 35 U.S.C. § 112

The grounds identified below both individually and collectively render certain of the Asserted Claims invalid under the statutory requirements of § 112. By identifying certain claim language below, HP does not imply that such language is entitled to any patentable weight when comparing the claim as a whole to the prior art. HP's identifications are made based on HP's present understanding of the Asserted Claims and Plaintiff's apparent interpretation of these claims as reflected in its Infringement Contentions, and HP reserves the right to amend these identifications, including in response to claim constructions and claim interpretations that would render claim limitations not enabled, lacking in written description, or indefinite. To the extent a claim element is contained within an element identified below or encompass an element identified below, that claim element also renders the claim invalid under 35 U.S.C. § 112

A. Lack Of Enablement And Written Description

35 U.S.C. § 112 includes an enablement requirement: "The specification shall contain a written description . . . of the manner and process of making and using [the invention] in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." 35 U.S.C. § 112, ¶ 1. To satisfy the enablement requirement, the disclosure "must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'" *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997); *MagSil Corp. v. Hitachi Glob. Storage Techs., Inc.*, 687 F.3d 1377, 1381 (Fed. Cir. 2012); *Sitrick v. Dreamworks, LLC*, 516 F.3d 993, 999 (Fed. Cir. 2008). If a specification teaches away from a substantial portion of the claim or does not enable the full scope of the claim, there is no enablement. *AK Steel Corp. v. Sollac*, 344 F.3d 1234 (Fed. Cir. 2003); *see also MagSil Corp.*, 687 F.3d at 1383-84 (Fed. Cir. 2012).

35 U.S.C. § 112 further includes a written description requirement: "The specification shall contain a written description of the invention . . . ." 35 U.S.C. § 112, ¶ 1. "To satisfy the written description requirement, a patent applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention." *ICU Medical Inc. v. Alaris Medical Systems, Inc.*, 558 F.3d 1368, 1377 (Fed. Cir. 2009) (internal quotation marks and citations omitted); *see also Synthes USA, LLC v. Spinal Kinetics, Inc.*, 734 F.3d 1332, 1340 (Fed. Cir. 2013). "The test [for written description support] requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed." *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc).

The specification must describe the claimed invention in sufficient detail so that a POSITA can recognize what is claimed. "The appearance of mere indistinct words in a specification or a claim, even an original claim, does not necessarily satisfy that requirement." *University of Rochester v. G.D. Searle & Co.*, 358 F.3d 916, 923 (Fed. Cir. 2004) (internal quotation marks and citations omitted).

1. The '437 Patent

Especially in view of the expansive scope of these claim limitations that General Video appears to take in its Infringement Contentions, at least the following claim terms or phrases of the '437 Patent are invalid for failing to adequately describe or enable under 35 U.S.C. § 112 ¶ (1) as indicated below:

Claim	Language
41	"providing words of input data capable of being encoded as a conventional sequence of code words of a full code word set"

41	"generating a sequence of selected code words by encoding the input data, wherein each of the selected code words is a member of a robust subset of the full code word set, and the sequence of selected code words is less susceptible to inter-symbol interference during transmission over the link than would be the conventional sequence of code words"
41	"transmitting over the link a first burst of the encoded control words between a first burst of the video code words and the burst of the selected code words, and a second burst of the encoded control words between the burst of the selected code words and a second burst of the video code words"

Claim 41 of the '437 Patent is invalid under 35 U.S.C. § 112 ¶ (1) because the claim language, when read in light of the intrinsic record and General Video's Infringement Contentions and apparent interpretation of the scope of the claim language, lacks adequate written description support for the terms "providing words of input data capable of being encoded as a conventional sequence of code words of a full code word set," "generating a sequence of selected code words by encoding the input data, wherein each of the selected code words is a member of a robust subset of the full code word set, and the sequence of selected code words is less susceptible to inter-symbol interference during transmission over the link than would be the conventional sequence of code words," and "transmitting over the link a first burst of the encoded control words between a first burst of the video code words and the burst of the selected code words, and a second burst of the encoded control words between the burst of the selected code words and a second burst of the video code words," nor is the provided description sufficient to enable one of ordinary skill in the art to implement the claimed "providing words of input data capable of being encoded as a conventional sequence of code words of a full code word set," "generating a sequence of selected code words by encoding the input data, wherein each of the selected code words is a member of a robust subset of the full code word set, and the sequence of selected code words is less susceptible to inter-symbol interference during transmission over the link than would be the conventional

sequence of code words," and "transmitting over the link a first burst of the encoded control words between a first burst of the video code words and the burst of the selected code words, and a second burst of the encoded control words between the burst of the selected code words and a second burst of the video code words," nor is the provided description sufficient to one of ordinary skill in the art such that such a person would reasonably conclude that the inventor had possession of the invention at the time of filing.

2. The '010 Patent

Especially in view of the expansive scope of these claim limitations that General Video appears to take in its Infringement Contentions, at least the following claim terms or phrases of the '010 Patent are invalid for failing to adequately describe or enable under 35 U.S.C. § 112 ¶ (1) as indicated below:

Claim	Language
1	"a second mode to generate a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity"
1	"the signaling information identifying which mode the formatter is using and characteristics of said steam of second data elements"
1	"a formatter arranged to format the data for transport over the interface, wherein the formatter, in accordance with signal information received from the second audio-device, is operable in: a first mode . . . and . . . a second mode . . ."
12	"a processor arranged to extract said image data, the processor being operable, in accordance with capabilities of said second audio-visual device"
12	"in a second mode, the processor demultiplexes components of a stereoscopic image from a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image data elements being transmitted in a first portion of said interface and in a second

	portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity"
12	"the signaling information identifying which of said first mode and said second mode is used and characteristics of said steam of second data elements."

Claim 1 of the '010 Patent is invalid under 35 U.S.C. § 112 ¶ (1) because the claim language, when read in light of the intrinsic record and General Video's Infringement Contentions and apparent interpretation of the scope of the claim language, lacks adequate written description support for the terms "a second mode to generate a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity," "a formatter arranged to format the data for transport over the interface, wherein the formatter, in accordance with signal information received from the second audio-device, is operable in: a first mode . . . and . . . a second mode . . .," and "the signaling information identifying which mode the formatter is using and characteristics of said steam of second data elements," nor is the provided description sufficient to enable one of ordinary skill in the art to implement the claimed "a second mode to generate a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity," ," "a

formatter arranged to format the data for transport over the interface, wherein the formatter, in accordance with signal information received from the second audio-device, is operable in: a first mode . . . and . . . a second mode . . .," and "the signaling information identifying which mode the formatter is using and characteristics of said steam of second data elements," nor is the provided description sufficient to one of ordinary skill in the art such that such a person would reasonably conclude that the inventor had possession of the invention at the time of filing.

Claim 12 of the '010 Patent is invalid under 35 U.S.C. § 112 ¶ (1) because the claim language, when read in light of the intrinsic record and General Video's Infringement Contentions and apparent interpretation of the scope of the claim language, lacks adequate written description support for the terms "in a second mode, the processor demultiplexes components of a stereoscopic image from a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image data elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity," "a processor arranged to extract said image data, the processor being operable, in accordance with capabilities of said second audio-visual device," and "the signaling information identifying which of said first mode and said second mode is used and characteristics of said steam of second data elements," nor is the provided description sufficient to enable one of ordinary skill in the art to implement the claimed "in a second mode, the processor demultiplexes components of a stereoscopic image from a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image data elements being transmitted in a first portion of said interface and

in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity," "a processor arranged to extract said image data, the processor being operable, in accordance with capabilities of said second audio-visual device," and "the signaling information identifying which of said first mode and said second mode is used and characteristics of said steam of second data elements," nor is the provided description sufficient to one of ordinary skill in the art such that such a person would reasonably conclude that the inventor had possession of the invention at the time of filing.

3. The '786 Patent

Especially in view of the expansive scope of these claim limitations that General Video appears to take in its Infringement Contentions, at least the following claim terms or phrases of the '786 Patent are invalid for failing to adequately describe or enable under 35 U.S.C. § 112 ¶ (1) as indicated below:

Claim	Language
1	"a second mode, different from the first mode, operating at different times than the first mode, in which the formatter generates a stream of second data elements comprising a multiplexed combination of components of a stereoscopic image"
1	"wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode"
13	"a second mode, different from the first mode, operating at different times than the first mode, in which the processor de-multiplexes components of a stereoscopic image from a stream of second data elements comprising a multiplexed combination of components of a stereoscopic image"
13	"wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode"

Claim 1 of the ’786 Patent is invalid under 35 U.S.C. § 112 ¶ (1) because the claim language, when read in light of the intrinsic record and General Video’s Infringement Contentions and apparent interpretation of the scope of the claim language, lacks adequate written description support for the term “a second mode, different from the first mode, operating at different times than the first mode, in which the formatter generates a stream of second data elements comprising a multiplexed combination of components of a stereoscopic image,” and “wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode,” nor is the provided description sufficient to enable one of ordinary skill in the art to implement the claimed “a second mode, different from the first mode, operating at different times than the first mode, in which the formatter generates a stream of second data elements comprising a multiplexed combination of components of a stereoscopic image,” and “wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode,” nor is the provided description sufficient to one of ordinary skill in the art such that such a person would reasonably conclude that the inventor had possession of the invention at the time of filing.

Claim 13 of the ’786 Patent is invalid under 35 U.S.C. § 112 ¶ (1) because the claim language, when read in light of the intrinsic record and General Video’s Infringement Contentions and apparent interpretation of the scope of the claim language, lacks adequate written description support for the term “a second mode, different from the first mode, operating at different times than the first mode, in which the processor de-multiplexes components of a stereoscopic image

from a stream of second data elements comprising a multiplexed combination of components of a stereoscopic image," and wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode," nor is the provided description sufficient to enable one of ordinary skill in the art to implement the claimed "a second mode, different from the first mode, operating at different times than the first mode, in which the processor de-multiplexes components of a stereoscopic image from a stream of second data elements comprising a multiplexed combination of components of a stereoscopic image," and wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode," nor is the provided description sufficient to one of ordinary skill in the art such that such a person would reasonably conclude that the inventor had possession of the invention at the time of filing.

4. The '282 Patent

Especially in view of the expansive scope of these claim limitations that General Video appears to take in its Infringement Contentions, at least the following claim terms or phrases of the '282 Patent are invalid for failing to adequately describe or enable under 35 U.S.C. § 112 ¶ (1) as indicated below:

Claim	Language
1	"re-mapping a data signal and a clock signal from a first local bus on the source into a different protocol signal"
1	"re-mapping the different protocol signal back into the data signal and the clock signal for use on a second local bus on the sink"
1	"re-mapping the data signal and the clock signal from the second local bus into the different protocol signal"

1	"transmitting the different protocol signal from the sink to the source over the two-wire interface"

Claim 1 of the '282 Patent is invalid under 35 U.S.C. § 112 ¶ (1) because the claim language, when read in light of the intrinsic record and General Video's Infringement Contentions and apparent interpretation of the scope of the claim language, lacks adequate written description support for the terms "re-mapping a data signal and a clock signal from a first local bus on the source into a different protocol signal," "re-mapping the different protocol signal back into the data signal and the clock signal for use on a second local bus on the sink," "re-mapping the data signal and the clock signal from the second local bus into the different protocol signal," and "transmitting the different protocol signal from the sink to the source over the two-wire interface," nor is the provided description sufficient to enable one of ordinary skill in the art to implement the claimed "re-mapping a data signal and a clock signal from a first local bus on the source into a different protocol signal," "re-mapping the different protocol signal back into the data signal and the clock signal for use on a second local bus on the sink," "re-mapping the data signal and the clock signal from the second local bus into the different protocol signal," and "transmitting the different protocol signal from the sink to the source over the two-wire interface," nor is the provided description sufficient to one of ordinary skill in the art such that such a person would reasonably conclude that the inventor had possession of the invention at the time of filing.

B. Indefiniteness

Section 112, ¶ 2 includes a definiteness requirement: "[T]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. § 112, ¶ 2. "[A] patent is invalid for indefiniteness if its claims, read in light of the patent's specification and prosecution history, fail

to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

The definiteness requirement requires that the claim must set forth what the applicant regards as the invention and do so with sufficient particularity and definiteness. *Allen Eng'g Corp. v. Bartell Indus.*, 299 F.3d 1336, 1348 (Fed. Cir. 2002). Where it would be apparent to one of skill in the art, based on the patent specification, that the "invention" set forth in a claim is not what the patent applicant regarded as the invention, the claim is invalid. *Id.*

1. The '437 Patent

At least the following claim terms or phrases of the '437 Patent render the Asserted Claim of the '437 Patent invalid under 35 U.S.C. § 112 ¶ (2):

Claim	Language
41	"the video code words"
41	"the burst of the selected code words"
41	"a robust subset"
41	"less susceptible" / "less susceptible to intersymbol interference"

For example, the limitations identified above lack antecedent basis and are thus fail to adequately define the limits of the scope of the claim.

2. The '010 Patent

At least the following claim terms or phrases of the '010 Patent render the Asserted Claim of the '010 Patent invalid under 35 U.S.C. § 112 ¶ (2):

Claim	Language
1	"a second mode to generate a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity"

Claim	Language
1	"the signaling information identifying which mode the formatter is using and characteristics of said steam of second data elements"
12	"in a second mode, the processor demultiplexes components of a stereoscopic image from a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image data elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity"
12	"a processor arranged to extract said image data, the processor being operable, in accordance with capabilities of said second audio-visual device"
12	"the signaling information identifying which of said first mode and said second mode is used and characteristics of said steam of second data elements."

For example, these claim terms are not clear in light of the specification as to what data carrying capacity refers to. As a further example, these claim terms are not clear in light of the specification as to how a second mode to generate a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying capacity no greater than said known data carrying capacity. As a further example, these claim terms are not clear in light of the specification as to how in a second mode, the processor demultiplexes components of a stereoscopic image from a stream of second data elements which carry a multiplexed combination of components of a stereoscopic image, wherein said components of said stereoscopic image data elements being transmitted in a first portion of said interface and in a second portion of said interface, each of said first portion and said second portion having a lesser data carrying capacity than said known data carrying capacity and a combined data carrying

capacity no greater than said known data carrying capacity. As another example, these claim terms are not clear in light of the specification as to how the processor in the first audio-visual device is arranged to extract image data, in accordance with capabilities of the second audio-visual device.

3. The ’786 Patent

At least the following claim terms or phrases of the ’786 Patent render the Asserted Claim of the ’786 Patent invalid under 35 U.S.C. § 112 ¶ (2):

Claim	Language
1	“wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode”
13	“wherein the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode;”

For example, these claim terms are not clear in light of the specification as to how the signaling information comprises information with respect to a multiplexing scheme used in a second mode for enabling the second audio-visual device to determine a decoding scheme to be used to decode a stereoscopic image format being used in the second mode.

4. The ’282 Patent

At least the following claim terms or phrases of the ’282 Patent render the Asserted Claim of the ’282 Patent invalid under 35 U.S.C. § 112 ¶ (2):

Claim	Language
1	“re-mapping the data signal and the clock signal from the second local bus into the different protocol signal”
1	“transmitting the different protocol signal from the sink to the source over the two-wire interface”

For example, these claim terms are not clear in light of the specification as to whether it means the exact same data signal and clock signal based on its antecedent basis, or a different data

and clock signal in the same format and on the same second bus. Therefore, they fail to adequately define the limits of the scope of the claim.

5. The ’443 Patent

At least the following claim terms or phrases of the ’443 Patent render the Asserted Claims of the ’443 Patent invalid under 35 U.S.C. § 112 ¶ (2):

Claim	Language
7	“wherein the audio-related information includes monitor information indicating whether or not the audio data is capable of being monitored in the reception step

For example, this claim term is not clear in light of the specification as to how audio data is monitored, and the specification provides no objective standard by which one of ordinary skill in the art could determine whether or how audio data is capable of being monitored. Therefore, they fail to adequately define the limits of the scope of the claim.

6. The ’224 Patent

At least the following claim terms or phrases of the ’224 Patent render the Asserted Claims of the ’224 Patent invalid under 35 U.S.C. § 112 ¶ (2):

Claim	Language
3	“an analysis section operable to determine whether or not the audio data is capable of being monitored by the receiver”
3	“the analysis section determines whether or not the audio data is capable of being monitored by the receiver based on the monitor information.”

Claim 3 of the ’224 Patent (and its respective dependent claims) are invalid for lack of definiteness because a person of ordinary skill in the art would be unable to understand the bounds of these claims as a result of the limitations identified above because this claim term is not clear in light of the specification as to how how audio data is capable of being monitored. Additionally, the ’224 Patent provides no objective standard by which one of ordinary skill in the art could

determine whether the recited limitations require performance of a method step by the analysis section. *See IPXL Holdings, L.L.C. v. Amazon.com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005) (A claim that "recites both a system and the method for using that system… does not apprise a person of ordinary skill in the art of its scope, and… is invalid under section 112, paragraph 2.).

VIII. DOCUMENT PRODUCTION ACCOMPANYING INVALIDITY CONTENTIONS: P.R. 3-4

With these Invalidity Contentions, HP is also producing and/or making available for inspection the documents required under Local Patent Rule 3-4 and the Court's Docket Control Order under separate cover. As stated above, Plaintiff's Infringement Contentions are insufficient, as they do not provide HP with reasonable notice of the accused products. HP will continue to produce documents as required under Local Patent Rule 3-4 and the Court's Docket Control Order consistent with Plaintiff's anticipated supplementation to its Infringement Contentions. HP reserves the right to produce and rely on additional documents relating to the prior art or the accused products in view of, for example, additional information revealed during discovery regarding Plaintiff's allegations and/or amendments to Plaintiff's Infringement Contentions as discovery processes.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned attorney hereby certifies that all counsel of record for Plaintiff are being served with a copy of this document via email delivery on June 26, 2025.

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