

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIDENDUM PRODUCTION SOLUTIONS, INC.,
Petitioner,

v.

ROTOLIGHT LIMITED,
Patent Owner.

Case IPR2023-01218
Patent 10,845,044

**PATENT OWNER'S PRELIMINARY RESPONSE TO PETITION FOR
INTER PARTES REVIEW OF U.S. PATENT NO. 10,845,044**

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Exhibit List

Exhibits for Currently Filed Patent Owner’s Preliminary Response

Exhibit No.	Description
2001	Complaint for Patent Infringement <i>Rotolight Ltd. v. Videndum PLC et al.</i> , Case No. 1:22-cv-00928-UNA (D. Del. July 12, 2022).
2002	Declaration of Eric Bretschneider, Ph.D. (“Bretschneider Decl.”), filed previously as Ex. 2011 in IPR2022-00099
2003	Vitec Group PLC Name Change to Videndum PLC, Certificate of Incorporation on Name Change
2004	IPR2022-00099 Petition for <i>Inter Partes</i> Review of U.S. Patent No. 10,845,044 filed by Arnold & Richter Cine Technik GmbH & Co. Betriebs KG (“ARRI”)

Claim Listing '044 Patent

No.	Description
Claim 1	
1[pre]	A method for controlling a lighting device to produce a range of different user customisable lighting effects, the method comprising:
1[a]	receiving user input of at least one user input simulation parameter to customise a lighting effect;
1[b]	storing in memory said at least one user input simulation parameter, said at least one user input simulation parameter depending on the lighting effect being simulated;
1[c]	recalling from said memory said at least one stored user input simulation parameter;
1[d]	calculating, using an effect simulator, a time varying lighting value based on said recalled simulation parameter;
1[e]	outputting to said lighting device said time varying lighting value thereby to simulate the lighting effect.
Claim 2	
	The method according to claim 1, wherein said user customisable simulation parameter is stored locally.
Claim 3	
	The method according to claim 1, wherein the simulation parameter comprises a colour or colour temperature.
Claim 4	
	The method according to claim 1, wherein the simulation parameter is related to at least one of: an effect frequency; an effect speed; a colour; a colour temperature; a trigger; a rate of increase of brightness; a rate of decrease of brightness; a rate of change of colour; a brightness; a local maximal (peak) brightness; a local minimal brightness; a brightness fluctuation period; and a colour fluctuation time period.
Claim 5	
	The method according to claim 1, wherein the lighting effect comprises a short time-period (e.g. stroboscopic) lighting effect with a user adjustable minimum pulse width.
Claim 6	
	The method according to claim 1, wherein the user customizable simulation parameter comprises a parameter indicative of a

	group consisting of: a camera recording frequency; a camera shutter speed; and a camera frame rate.
Claim 7	
	The method according to claim 1, wherein the lighting effect is designed to mimic at least one of: fire; lightning; police car light; television; a neon flickering sign; a candle; muzzle (gunshot); welding; spark/short circuit; a scan (e.g. fingerprint scanner); paparazzi flashes; fireworks; flashes (strobe); a propeller; a (nuclear) explosion; and a wormhole.
Claim 8	
	The method according to claim 1, wherein the lighting value comprises brightness and/or colour data.
Claim 9	
	The method according to claim 1, further comprising converting at least one of brightness and colour data into a lighting signal and outputting the lighting signal to the lighting device.
Claim 10	
	The method according to claim 1, wherein the controlling is for a lighting system for videography, broadcast, cinematography, studio filming and/or location filming.
Claim 11	
	The method according to claim 1, further comprising controlling at least one further lighting device.
Claim 12	
12[pre]	A system adapted to control at least one lighting device to produce a range of different user customisable lighting effects, the system comprising:
12[a]	an input interface adapted to receive user input of at least one user input simulation parameter to customise a lighting effect;
12[b]	a memory adapted to store said at least one user input simulation parameter, said at least one user input simulation parameter depending on the lighting effect being simulated; and
12[c]	an effect simulator adapted to: recall from said memory said at least one stored user input simulation parameter; and
12[d]	calculate a time varying lighting value based on said recalled simulation parameter;

12[e]	wherein the effect simulator is adapted to output said calculated time varying lighting value to the at least one lighting device thereby to simulate a lighting effect.
Claim 13	
	The system according to claim 12, wherein the system is adapted to control at least one further lighting device.
Claim 14	
	The system according to claim 12, further comprising an input interface and wherein the input interface comprises at least one of: a wireless communication interface; a dial; a slider; a display and buttons.
Claim 15	
	The system according to claim 12, wherein said at least one lighting device is integrated in a combined unit.
Claim 16	
	The system according to claim 12, wherein the at least one lighting device comprises a lighting device for videography, broadcast, cinematography, studio filming and/or location filming.
Claim 17	
	The system according to claim 12, wherein the at least one lighting device comprises at least one light emitting diode.
Claim 18	
	A lighting device according to claim 17, wherein the at least one lighting device is used for videography, broadcast, cinematography, studio filming and/or location filming.
Claim 19	
19[pre]	A computer program product comprising software code for controlling a lighting device to produce a range of different user customisable lighting effects the computer program product is adapted to perform, when executed, the steps of:
19[a]	receiving user input of at least one user input simulation parameter to customise a lighting effect;
19[b]	storing in memory said at least one user input simulation parameter, said at least one user input simulation parameter depending on the lighting effect being simulated;
19[c]	recalling from said memory said at least one stored user input simulation parameter;

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19[d]	calculating, using an effect simulator, a time varying lighting value based on said recalled simulation parameter; and
19[e]	outputting to said lighting device said time varying lighting value thereby to simulate a lighting effect.

I. Introduction

Patent Owner, Rotolight Limited (“Patent Owner” or “Rotolight”) respectfully requests that the Board deny institution of the Petition for numerous independent reasons. First, the Board should exercise its discretion and deny the Petition under 35 U.S.C § 314(a) because all of the factors that the Board considers when exercising its discretion weigh against institution.

Petitioner Videndum Production Solutions, Inc.’s (“Petitioner’s”) current IPR Petition is a copycat petition (with some added portions based on “road-mapping”) of a petition filed 22 months before the filing of this 2nd Petition. Petitioner was aware of the art and the petition that it copied for at least 19 months and therefore has had multiple opportunities to tailor its arguments for this Petition based on Patent Owner’s past responses to validity challenges and did in fact make modifications after seeing Patent Owner’s arguments and decisions from the Board.

Second, the Board should deny institution based upon the merits. Petitioner challenges the claims of the ’044 patent on two references in four grounds. Grounds 1 and 2 are based on a user manual of the Astera AX10 SpotMax product (the “Astera Manual”). Grounds 3 and 4 are based on U.S. Patent No. 9,743,010 to Edwards (EX1006, “Edwards”).

Petitioner has not established a reasonable likelihood that it will prevail on any Ground presented in the Petition. Both the Astera Manual and Edwards fail to

anticipate or render obvious the claims of the '044 Patent because neither of these references discloses “calculating” a time varying lighting value as is required by each of the independent claims. The Astera Manual only discloses replaying pre-defined lighting values. Replaying pre-defined patterns is distinct from, and does not anticipate the required calculation of a time varying lighting value as claimed in the '044 Patent. The Astera Manual merely recalls and replays pre-defined effects, or time varying lighting values, rather than *calculating* those time varying lighting values.

The second challenge is based on Edwards, a patent generally related to a system for synchronizing LED lighting to the shutters of fast digital cameras. In particular, Edwards focuses on synchronizing changes in lighting to the camera shutter for videos and motion pictures to enable all lighting transitions to be done between frames. Edwards describes receiving user input “light levels, color temperature, and dimming” to create “lighting schemes.” The '044 Patent illustrates that merely converting user inputs to signals the lighting device can execute is *not* “calculating ... a time varying lighting value.”

Without a calculation step, each of the Astera and Edwards grounds fail to anticipate or render obvious the '044 Patent claims.

II. Related Cases

The '044 Patent has been involved in the following matters:

- *Arnold & Richter Cine Technik GmbH & Co. Betriebs KG v. Rotolight Limited*, Case No. IPR2022-00099 (PTAB).
- *Rotolight Limited v. ARRI Inc. et. al.*, Case No. 1:22-cv-00983 (D. Del.).
- *Rotolight Limited v. Videndum PLC et. al.*, Case No. 1:22-cv-00928 (D. Del.).
- *Rotolight Limited v. Chauvet & Sons, LLC*, Case No. 1:23-cv-00364 (D. Del.).
- *Rotolight Limited v. Aputure Imaging Industries Co., Ltd.*, Case No. 4:23-cv-00508 (E.D. Tex.).

III. Claim Construction

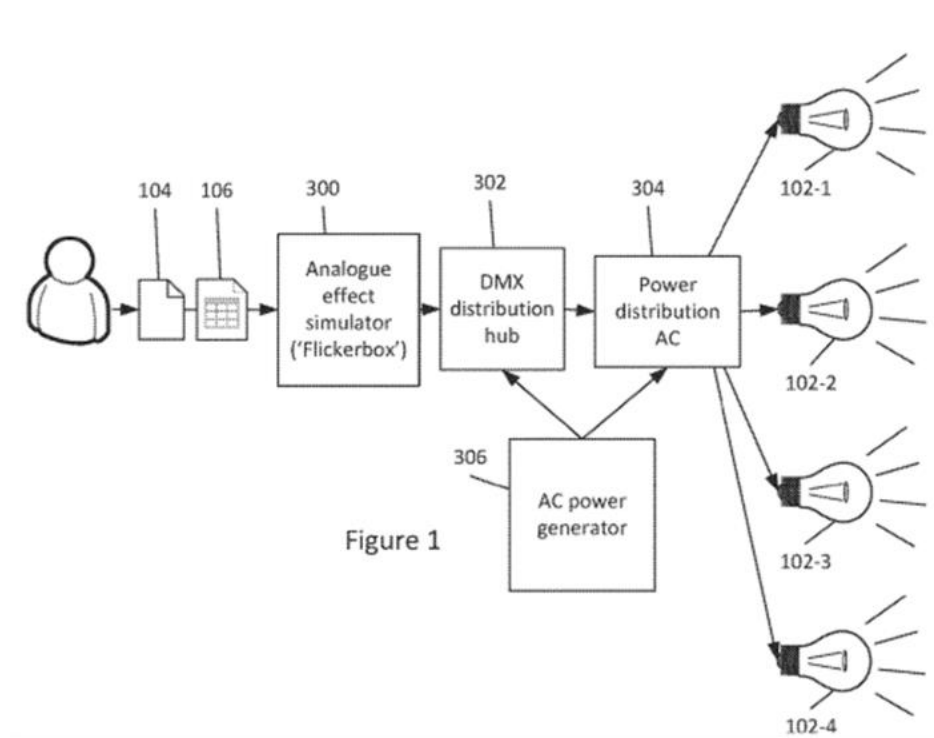
For the purposes of determining whether to institute inter partes review, all claim terms in this proceeding are to be construed according to the *Phillips* standard. Petitioner takes the position that no claim constructions are necessary. Petition, 7. Patent Owner believes no express claim constructions are necessary to address the arguments presented in this Preliminary Response. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

In responding to Petitioner's challenges, Patent Owner includes arguments regarding the correct interpretation of the claims, but, without waiver of Patent Owner's right to further propose claim constructions as may be warranted and

applicable, Patent Owner believes that express claim constructions are not necessary to deny institution at this stage.

IV. Overview of the '044 Patent

The '044 Patent was filed on April 7, 2017, and claims priority to U.S. Provisional Application No. 62/319,809, filed April 8, 2016. EX1002, 3, 41. The '044 Patent describes a lighting system and method for controlling the lighting system. *See* EX1001, Abstract. The '044 Patent explains that in the film, broadcast and TV industries, there is an apparatus called a “flicker box,” which is provided independently of the lighting device(s), to mimic flickering light such as a fire place, candle, electrical spark, or lightning. EX1001, 1:18-23. Use of a conventional flicker box is a “complex, costly and time consuming process that requires the setup, connection and control of multiple pieces of hardware typically including external Digital Multiplex (DMX) and power distribution devices.” EX1001, 1:27-31. Flicker boxes also require specialists. EX1001, 1:33-35. FIG. 1 of the '044 Patent shows this conventional arrangement:



EX1001, FIG. 1; EX2002, ¶54.

To overcome the disadvantages of conventional flicker boxes, the '044 Patent discloses an improved lighting system that involves controlling the lighting device to produce a user-customizable lighting effect that is time varying.

EX1001, 1:46-51. As shown in FIG. 2, the '044 Patent provides a single studio lamp device 120 with an integrated light 102 and a lighting effect simulator 100.

EX1001, 5:54-64, FIG. 2.

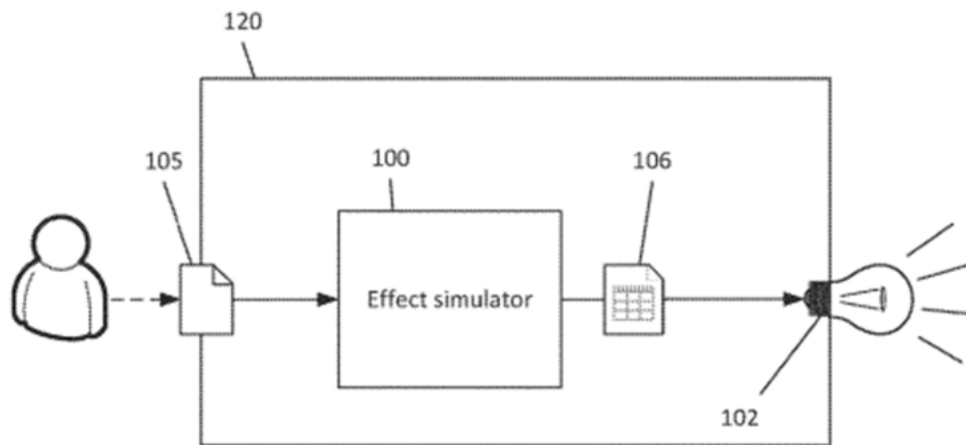


Figure 2

EX1001, FIG. 2; EX2002, ¶55.

This arrangement allows for the DMX distribution hub and more complex circuitry associated with a “flicker box” to be dispensed with, and yet also provides more flexibility in producing lighting effects. EX1001, 5:54-63; EX2002, ¶56.

This flexibility in the lighting system is provided by a control panel 104 that includes, e.g., buttons, knobs, or a digital interface for user input of parameters for simulating an effect. EX1001, 5:63-6:2. The lighting system includes an effect simulator integrated into the lamp device 120 for performing calculations such as how the lighting changes over time in order to produce the desired lighting effect. EX1001, 5:61-63, 7:26-42, 9:40-61, FIG. 4. This combination of a user interface, effect simulator (which calculates the time-varying lighting value), and lighting device introduces a simpler and less expensive system, but one that is flexible and

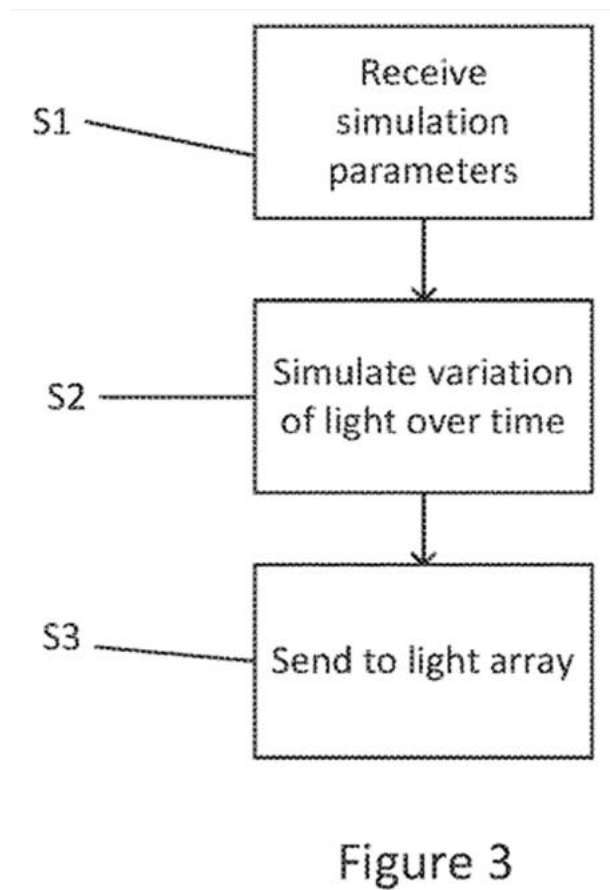
dynamic. *See* EX1001, 6:9-36; EX2002, ¶57.

A. The Calculating Limitation

Each of independent claims 1, 12, and 19 of the '044 Patent require a variation of:

- “calculating, using an effect simulator, a time varying lighting value.” (EX1001, Cl. 1; EX2002, ¶79);
- “calculate a time varying lighting value based on said recalled simulation parameter” (Cl. 12; EX2002, ¶79); and
- “calculating, using an effect simulator, a time varying lighting value based on said recalled simulation parameter.”; (Cl. 19; EX2002, ¶79); (collectively, the “calculating limitation”).

The specification of the '044 Patent describes the requisite calculating step, stating that “[t]he simulation calculates how the lighting changes over time in order to produce the desired lighting effect.” EX1001, 7:31-33; EX2002, ¶¶78-81. This calculating step is further embodied in the flow chart in FIG. 3, recreated below:

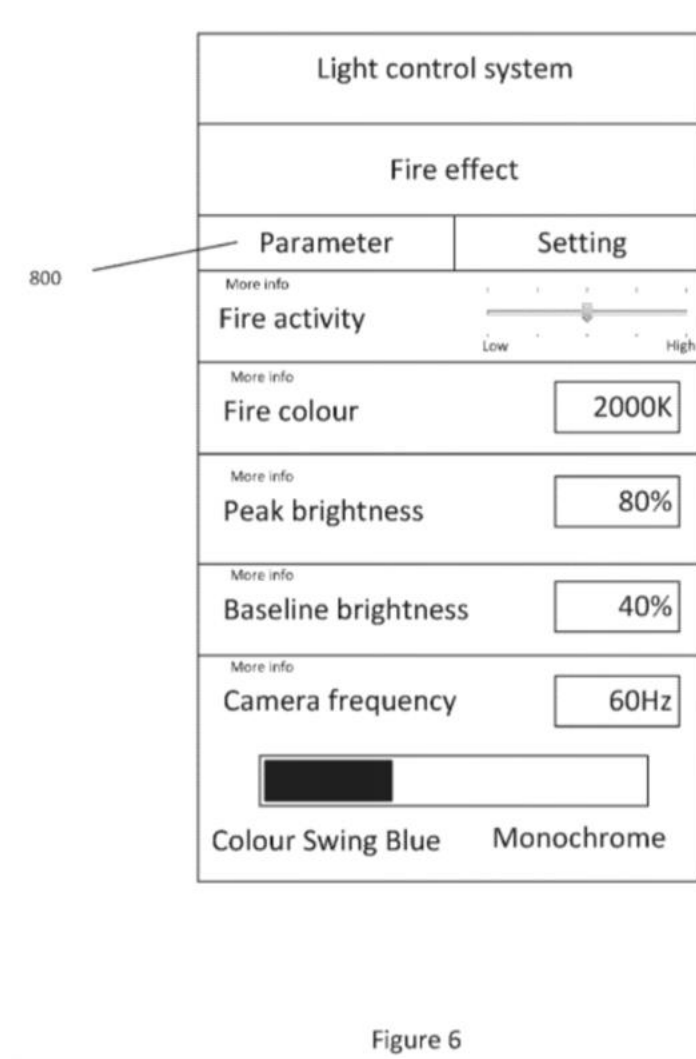


EX1001, FIG. 3; EX2002, ¶81.

As shown above, the lighting device first receives simulation parameters (e.g., a user input simulation parameter), and simulates the variation of light over time. EX1001, 7:19-28, FIG. 3. The “user input simulation parameters may be stored in memory 220 and recalled from the memory 220 at a later time.” EX1001, 9:31-33. The lighting device simulates the effect by using the user input simulation parameters to calculate how the lighting changes over time. EX1001, 7:31-33. Critically, this ties the calculating limitation directly to a user input simulation parameter that is stored and recalled (i.e., the calculating is “based on said recalled

simulation parameter”). EX1001, 11:54-56, 12:40-44, 13:12-14; EX2002, ¶82.

FIG. 6 of the '044 Patent illustrates an embodiment of a control panel that receives user input of a parameter to customize a lighting effect:



EX1001, FIG. 6; EX2002, ¶83.

In the example shown in FIG. 6, the “customized lighting effect” is a “Fire effect.” The user is able to input a “simulation parameter,” such as fire color or

peak brightness. The “time varying lighting value” is calculated by the lighting effect simulator 100 based on at least that recalled simulation parameter. EX1001, 5:61-63, 7:19-33, 7:40-42, 8:27-29, 9:57-61; EX2002, ¶84. Thus, the '044 Patent discloses and claims an effect simulator that *calculates a time varying lighting value* based at least on a simulation parameter. EX1001, 5:61-63, 7:19-33, 7:40-42, 8:27-29, 9:57-61; *see also id.* cls. 1, 12, 19; EX2002, ¶85 (discussing an example in the context of FIG. 6).

FIG. 7 demonstrates an example where a brightness varying over time is generated algorithmically by the effect simulator disclosed in the '044 Patent. EX1001, 10:30-46.

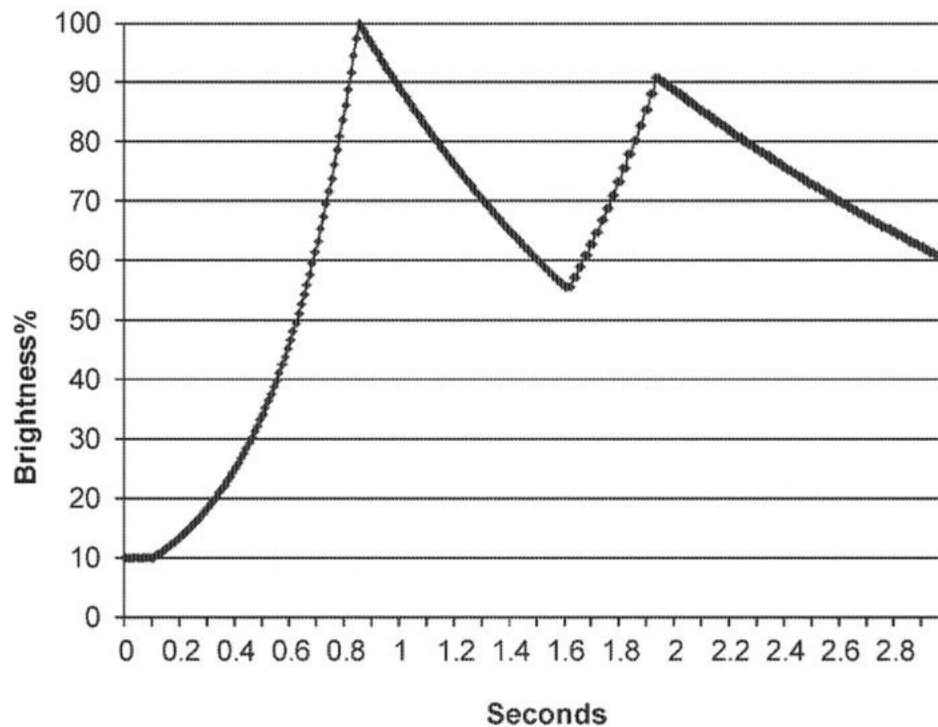


Figure 7

EX1001, FIG. 7.

In particular, the '044 Patent provides an example of a fire-effect-generating algorithm that calculates such a brightness-over-time pattern. See EX1001, 9:42-53; EX2002, ¶86. In this example, a series of sparks is generated sequentially to produce a realistic fire simulation, according to an algorithm. See, e.g., EX1001, 10:9-29; EX2002, ¶87. Such an algorithm provides an example demonstrating how the effect simulator calculates a time varying lighting value based on various simulation parameters. EX1001, FIG. 7 (showing an example of time varying lighting values calculated by the effect simulator); EX2002, ¶¶86-88.

The '044 Patent further explains “[t]he lighting effect simulator typically cycles round a loop calculating new lamp brightness and colour values.” EX1001, 9:57-58; EX2002, ¶89. Performing a calculation in this manner using an algorithm generates more controllable and realistic-looking fire effects than replaying a pre-recorded set of values chosen to mimic a fire. EX2002, ¶90.

The effect simulator disclosed in the '044 Patent is not simply recalling a stored lighting value or set of stored lighting values and adjusting them to create variations of effects. EX2002, ¶¶91-98. When the effect simulator disclosed in the '044 Patent generates a lighting effect, it does so by actively *calculating time varying lighting value* based on a simulation parameter, not by *passively replaying* an existing lighting effect stored in memory. EX2002, ¶91. Further, the '044 Patent

explicitly describes the advantages of an actively simulated fire effect over a passively replayed fire effect: controllability and realism. ’044 Patent, 9:67-10:6. Here, the ’044 Patent contrasts the disclosed calculated fire effect with “sampling the intensity of a real flame and replaying it at different speeds.” *Id.*; EX2002, ¶92.

V. Grounds

Petitioner proffers four grounds for attacking the Challenged Claims:

Ground	Claims	Basis	Prior Art References
1	1-19	§ 102	Astera (EX1003)
2	1-19	§ 103	Astera (EX1003)
3	1-19	§ 102	Edwards (EX1006)
4	1-19	§ 103	Edwards (EX1006)

See Petition, 3. Each ground addresses independent claims 1, 12, and 19 and various dependent claims (“Challenged Claims”).

As discussed below, Petitioner has failed to meet its burden to show a reasonable likelihood that at least one of the Challenged Claims is unpatentable under any of the above asserted grounds.

VI. The Board Should Deny Institution of this Petition Under 35 U.S.C. § 314(a)

A. Background

In September and October 2021, Arnold & Richter Cine Technik GmbH & Co. (“ARRI”) filed four IPR petitions that challenged four patents owned by Patent Owner as shown in the chart below:

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Case	Claims at Issue	Filing Date	Prior Art Asserted	Status
IPR2021-01496 (’257 patent)	1-21	Sept 3, 2021	Astera and Pohlert	Terminated – Settlement Jan 30, 2023
IPR2021-01497 (’258 patent)	1-22	Sept 3, 2021	Showline Manual, Choong, Reinoso, and Pohlert	Terminated – Settlement Jan 30, 2023
IPR2021-01498 (’101 patent)	1-21	Sept 3, 2021	Astera and Edwards	Terminated – Settlement Jan 30, 2023
IPR2022-00099 (’044 patent)	1-19	Oct 25, 2021	Astera and Edwards	Terminated – Settlement Jan 30, 2023

A few months after the ARRI petitions were filed, Petitioner filed a set of two petitions challenging U.S. Patent Nos. 10,197,258 (“’258 patent”) and 10,197,257 (“’257 patent”), which were the subject of two ARRI IPRs (IPR2021-01496 (’257 patent) and -01497 (’258 patent)).¹

Case	Claims at Issue	Filing Date	Prior Art Asserted	Status
IPR2022-00261 (’257 patent)	1-21	Dec 3, 2021	Morgan and Julio	Institution Denied Mar 16, 2022
IPR2022-00262 (’258 patent)	1-22	Dec 3, 2021	Hinrichs, Morgan, and Pohlert	Institution Denied Mar 16, 2022

¹ Petitioner changed its name from “Vitec Production Solutions, Inc.” to “Videndum Production Solutions, Inc.” in May 2022. *See* EX2003.

Petitioner cited to the ARRI petitions in these petitions but elected to primarily assert different prior art than ARRI. *See, e.g.*, IPR2021-00262, Paper 1 at 1 (PTAB Dec. 3, 2021) (“The following currently pending matters relate to the challenged ’258 Patent: IPR2021–01497.”). The Board instituted proceedings in the ARRI IPRs but not Petitioner’s petitions. *See, e.g.*, IPR2022-00262, Paper 7 (PTAB June 8, 2022) (Decision Denying Institution).

Three ARRI IPRs proceeded through oral hearings; however, before the final written decision was issued, the parties terminated the four proceedings due to settlement on January 30, 2023.² *See* EX1011 (IPR2022-00099, Paper 40, Decision to Terminate Due to Settlement After Institution of Trial). Petitioner never sought to join any of the four IPRs but emailed the Board to oppose the termination the day after the parties filed joint motions to terminate. EX1010 (attempting “to inform the Board that termination of these proceedings is not appropriate and contrary to the public interest”). The Board noted receipt of Videndum’s email, but nonetheless granted termination, noting that “[Videndum] does not explain why it could not have filed copy-cat petitions along with motions for joinder in one or all of the instant proceedings, to serve as a back-up or understudy petitioner in the event of a settlement between the parties.” EX1011, 1, 6.

² IPR2022-00099, which challenged the ’044 Patent, was terminated before the oral hearing due to settlement.

Six months after the ARRI IPRs were terminated, Petitioner filed the current petitions on July 17, 2023, challenging the '257 patent, the '258 patent, and the '044 patent as shown in the chart below. The three petitions are copy-cat petitions (in some instances with portions added based on road-mapping from developments in the previous ARRI IPRs) of three of ARRI's now-terminated petitions challenging the same claims of the same patents with the same references. *Compare, e.g.,* Petition *with* EX2004 (IPR2022-00099 ARRI's Petition for IPR of U.S. Patent No. 10,845,044).

Case	Claims at Issue	Filing Date	Prior Art Asserted	Status
IPR2021-01220 ('257 patent)	1-21	July 17, 2023	Astera and Pohlert	Currently pending
IPR2021-01219 ('258 patent)	1-22	July 17, 2023	Showline Manual, Choong, Reinoso, and Pohlert	Currently pending
IPR2022-01218 ('044 patent)	1-19	July 17, 2023	Astera and Edwards	Currently pending

B. *General Plastic* Factors

Under § 314(a) and 37 C.F.R. § 42.108(a), the Director has discretion to deny institution. *Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, Case IPR2016–01357, Paper 19 at § II.B.4.i. (PTAB September 6, 2016) (*General Plastic*). In exercising its discretion to deny institution, the Board considers the seven *General Plastic* factors:

1. whether the same petitioner previously filed a petition directed to the same claims of the same patent;
2. whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition or should have known of it;
3. whether at the time of filing of the second petition the petitioner already received the patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition;
4. the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition;
5. whether the petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent;
6. the finite resources of the Board; and
7. the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review.

General Plastic, IPR2016–01357, Paper 19, at 8-10. As explained in detail below, at least six of the seven *General Plastic* factors weigh in favor of denying institution and the last factor is neutral. The Board should thus deny institution of this petition under 35 U.S.C. § 314(a).

1. Factor 1 on “same petitioner previously filed a petition directed to the same claims of the same patent” favors denying institution

Petitioner itself has not previously filed a petition challenging the '044 Patent. But Factor 1 also favors denying institution when there is a “significant relationship”

between the parties that have filed the IPR petitions and the IPR petitions challenge the same claims of the same patent. *Valve Corp. v. Elec. Scripting Prods., Inc.*, IPR2019-00062, Paper 11 at 9–10 (P.T.A.B. Apr. 2, 2019) (precedential). As Petitioner asserts, ARRI and itself were both “industry participants” and defendants in the District of Delaware accused of infringing the same patents. *See* EX1010 at 1. Further, Petitioner’s decision to copy portions of ARRI’s petition but to drop and reinforce those portions that were criticized by Patent Owner further ties the current petition to ARRI’s petition. *Ericsson Inc. v. Uniloc 2017, LLC*, IPR2019- 01550, Paper 8 at 11-12 (PTAB Mar. 17, 2020) (“The instant Petitioner’s decision to use the prior petitions as a roadmap for its own petition ties the interests of all of the petitioners together.”); *see also infra*, Section VI.B.3 (Factor 3).

2. Factor 2 “whether at the time of filing of the first petition the petitioner knew of the prior art asserted in the second petition” favors denying institution

Factor 2 also weighs in favor of denying institution because Petitioner was aware of the petition filed by ARRI on the ’044 Patent, and in the instant case Petitioner relies on the same art as in the ARRI petition (primarily copying the earlier petition by ARRI, but also copying from later filings in that proceeding based on developments in that case, i.e., road-mapping). When filing their first petitions on December 3, 2021, Petitioner knew of the asserted Astera and Edwards references because ARRI’s petition challenging the ’044 Patent was pending at the time

Petitioner filed its petitions for related patents. *See* EX2004, 3-4. There is no question that Petitioner knew of the pending IPR2022-00099 petition and its asserted references because Petitioner noticed the ARRI IPRs in the Mandatory Notices section of their first petitions. *See, e.g.,* IPR2022-00262, Paper 1 at 1. Though Petitioner does not cite to the IPR2022-00099 proceeding itself, the proceedings Petitioner cites to refer to the same prior art. *Id.* Furthermore, Petitioner, by its own admission to the Board, was monitoring the infringement cases against ARRI and the IPRs challenging the asserted patents. *See* EX1010.

Thus, factor 2 weighs in favor of denying institution.

3. Factor 3 on “whether at the time of filing of the second petition the petitioner already received the patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition” favors denying institution

Factor 3 also favors denying institution because at the time of filing of the current petition, Petitioner already received Patent Owner's Preliminary Response to the near-identical ARRI petition and the subsequent Board decision on whether to institute. Patent Owner filed its Patent Owner's Preliminary Response to ARRI's petition on February 18, 2022. *See* IPR2022-00099, Paper 8. The Board instituted review on May 12, 2022. The current petition was filed on July 17, 2023. A 17- and 14-month difference between receiving each paper, respectively, and submitting the current petition is a significant amount of time for Petitioner to consider the Patent

Owner's Preliminary Response. *See General Plastic*, Paper 19, at 10. Additionally, Petitioner had the benefit of receiving not only the institution decision, but also Patent Owner's Response (Paper 17, June 17, 2022), Patent Owner's Sur-reply (Paper 27, Oct. 21, 2022) in IPR2022-00099 before filing the current petition. Thus, Petitioner was able to monitor how arguments evolved and adjust the current petition accordingly.

In the current petition, Petitioner engaged in "road-mapping" by copying the IPR2022-00099 petition asserted by ARRI and bolstered arguments based on the proceedings. *Cf. Code200, UAB v. Bright Data, Ltd.*, IPR2022-00861, -00862, Paper 18 at 5 (PTAB Aug. 23, 2022) ("Indeed, 'road-mapping' concerns are minimized when, as in this case, a petitioner files a later petition that raises unpatentability challenges substantially overlapping with those in the previously-filed petition and the later petition is not refined based on lessons learned from later developments."). For example, Petitioner added additional analysis to attempt to establish that the Astera Manual is a printed publication, which Patent Owner contested in the ARRI IPR. *Compare* Petition, 6-7 with EX2004, 8. Additionally, a large point of contention in IPR2022-00099 was whether petitioner had met its burden in asserting that the prior art disclosed "calculating . . . a time varying lighting value." In an attempt to refine ARRI's petition based on lessons learned from later developments, the current Petitioner has taken the liberty of using the ARRI petition and later developments in

that case as a roadmap to substantially expand on how the prior art allegedly meets this limitation. *Compare* Petition 17-20 *with* EX2004, 31-34 (adding additional arguments into current petition from ARRI’s petition for Ground 1, including deposition testimony from the -00099 IPR filed by ARRI); Petition 34-35 *with* EX2004, 31-34 (adding arguments to the current petition regarding alleged obviousness, which Patent Owner had pointed out was deficient in the previous IPR); Petition, 43-45 *with* EX2004, 68-69 (adding arguments to current petition regarding “calculating” limitations).

As the Board has noted, “the filing of sequential attacks against the same claims, with the opportunity to morph positions along the way, imposes inequities on Patent Owner.” *General Plastic*, Paper 19, at 11. This is inequitable to Patent Owner and the very type of conduct that factor 3 seeks to protect against. Hence, factor 3 weighs in favor of denying institution.

4. Factor 4 on “the length of time that elapsed between the time the petitioner learned of the prior art asserted in the second petition and the filing of the second petition” favors denying institution

The long length of time—approximately 1 year and 10 months—that has elapsed since Petitioner learned of the prior art and the filing of the current petition favors denying institution under factor 4, particularly when Petitioner knew of the prior art asserted but chose not to raise it in an earlier Petition. *Valve*, IPR2019-00062, Paper 11 (determining that the fourth factor weight against a petitioner that

waited five months following the filing of a related petitioner's petition). Here, Petitioner knew of the Astera and Edwards references that ARRI asserted, but instead opted to not file any petition at all despite doing so for two other patents. It now brings the current petition nearly two years later asserting the very references that it chose not to raise. Further, Petitioner did not adequately explain *See Apple Inc. v. Uniloc 2017 LLC*, IPR2020-00854, Paper 9 at 11 (PTAB Oct. 28, 2020) why it delayed until nearly the last day of statutory bar to file petition that is verbatim in many respects (except for road-mapping to attempt to bolster the petition based on developments in the earlier IPR). (precedential) ("Because of the lack of explanation, we conclude that this fourth *General Plastic* factor weighs in favor of denying institution of the proceeding."). This is exactly the type of conduct that weighs in favor of denial of institution under factor 4.

5. Factor 5 on "adequate explanation for the time elapsed between the filings of multiple petitions" favors denying institution

The Petitioner waited until nearly the very last day, July 17, 2023, to file the the current petition before it became time-barred under 35 U.S.C. § 315(b). *See* EX2001, Complaint *Rotolight Ltd. v. Videndum PLC et al*, Case No. 1:22-cv-00928-MN-JLH, Dkt. No. 1 (D. Del. July 12, 2022). Petitioner provides no explanation as to why it waited so close to the deadline to file. This weighs in favor of denial under factor 5. *Apple*, IPR2020-00854, Paper 9 at 11 ("For the same reasons stated above,

for instance, Apple's lack of explanation, we conclude that this fifth General Plastic factor also weighs in favor of denying institution.").

Indeed, Petitioner's sole (albeit indirect) explanation for the delay was that it "was not time-barred from filing its own Petition challenging the '044 Patent using the same prior art," which is a misinterpretation of the Board's order in another IPR. *See* Petition, 2. Petitioner asserts that the Board itself noted that Petitioner can bring another challenge against the same patent and same claims as long as the challenge is not time-barred. *See id.* (citing EX1011 (IPR2022-00099, Paper 40, Decision to Terminate Due to Settlement After Institution of Trial)). But Petitioner misconstrues the Board's statement. Despite what Petitioner asserts, the Board did not state that Petitioner could later file its own Petition challenging the '044 Patent using the same prior art as long as it was not time-barred. *See* EX1011, 6-7. Rather, the Board questioned why Petitioner "could not have filed copy-cat petitions along with motions for joinder in one or all of the instant proceedings, to serve as a back-up or understudy petitioner in the event of a settlement between the parties." *See id.* at 6. Petitioner also incorrectly attributes the Board's statement about what the Petitioner said as the Board's own statement. *See id.* at 7. The Board wrote in its decision that "[*Videndum*] also indicates that it is not time-barred and may file its own petitions in the future." *Id.* (emphasis added). Thus, the Board merely noted what Videndum said, but did not concur with the statement.

Critically, Petitioner has had multiple opportunities to file a petition without delaying almost two years from Petitioner's initial petitions until nearly the final day before it would have been time-barred. Petitioner had ample time and the ability to file copy-cat petitions asserting the same references as ARRI. Indeed, the Board chastised Petitioner for not doing so in addition to not filing for a motion for joinder to join the ARRI petitions to serve as a back-up or understudy petitioner if it had wanted to participate. *See* EX1011, 6. And instead of filing a copy-cat petition asserting the same references soon after the Board granted termination of IPR2022-00099, again, Petitioner opted not to do so, and waited almost seven months to bring the current Petition.

6. Factor 6 “the finite resources of the Board” favor denying institution

Factor 6 weighs in favor of denying institution because the finite resources of the Board should not be squandered for Petitioner, which had several chances to challenge the '044 patent by joining the ARRI IPRs. *See T-Mobile USA, Inc. v. VoIP-Pal.com, Inc.*, IPR2023-00638, Paper 11 at 10-11 (PTAB July 28, 2023).

Instead of attempting to join the ARRI IPR proceedings, Petitioner opted to “lie behind the log” while ARRI advanced its petition. When ARRI and Patent Owner settled and moved to terminate, Petitioner suddenly jumped out from behind the log and argued strenuously that the Board should not grant termination. *See*

EX1010, 1. In the Board's decision granting termination, the Board questioned why Petitioner did not file its own copy-cat petitions along with motions for joinder and chastised the non-party Petitioner for its "late-asserted interests." *See* EX1011, 6.

It is exactly this type of conduct that exhausts the Board's finite resources that Factor 7 seeks to protect against. The Board concurred on how the petitioner's "two bites at the apple"-type conduct in *T-Mobile* drained its resources. *See T-Mobile*, Paper 11 at 12. But at least the petitioner in *T-Mobile* filed copy-cat petitions and a motion for joinder while the other instituted IPR was still pending. Here, Petitioner's conduct is that much more egregious because despite the Board's cautionary note, it did nothing for nearly seven months after termination of the ARRI IPRs. Bringing the copy-cat petitions now, likely before a whole new panel (or even the same panel) will be forced to learn (or re-learn) the patent and the references, creates a significant drain on finite Board resources.

Thus, Factor 6 weighs in favor of denying institution.

7. Factor 7 "the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review" is neutral

The seventh factor, "the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review," implicates an efficiency consideration. *See T-Mobile*, Paper 11 at 13. In a joinder scenario, the one-year deadline for entering a Final Written

Decision may be removed under 35 U.S.C. § 315(c). *See id.* But because the current petition is an entirely new trial and not joinder, factor 7 neither favors nor disfavors denying institution.

VII. The Astera Manual Fails to Anticipate or Render Obvious Claims 1-19 (Grounds 1-2)

The Astera Manual does not anticipate or render obvious the Challenged Claims of the ’044 Patent.

A. Overview of the Astera Manual

The Astera Manual is a user manual for the Astera AX10 SpotMax™ LED (“AX10”) spotlight. EX1004, cover. The Astera Manual discloses that the AX10 spotlight can be controlled using a local control panel, such as the “infrared remote control,” the AsteraApp™, or “wireless DMX.” EX1004, 9-11. The local control panel includes a simple interface for selecting between menus:

6.6 CONTROL PANEL

LEGEND			
			
BACK TO PREVIOUS MENU	SCROLL DOWN	SCROLL UP	CHOOSE/ CONFIRM
FROM THE STATUS SCREEN, PRESS THE ABOVE BUTTONS TO:			
ENTER THE MAIN MENU	FACTORY RESET	ENTER THE MAIN MENU	ENTER THE DMX MENU
HOLD THE ABOVE BUTTON FOR 2SECS TO:			
STANDALONE MENU	ADJUST SPEED	ADJUST BRIGHTNESS	CHANGE PROGRAM

EX1004, 11.

The local menu allows a user to input basic things like increased brightness or to select a “predefined program[]” for a single lighting device. EX1004, 11, 20-21. The pre-defined programs in the Astera Manual are shown here:

6.16.1 Predefined Programs

The predefined programs may use more than one pixel. To display these effects properly with your light, it is first necessary to group them into Flow-Sets and control them by the AsteraApp™ (see chapter 7.4).

If several lights are grouped into a Flow-Set, they form a virtual big light with several pixels.

Name	Pattern
ONE COLOR STATIC	A static color is displayed on the whole virtual light.
TWO COLOR STATIC	The virtual light is split into two halves and two colors are displayed.
THREE COLOR STATIC	The virtual light is split into three parts and three colors are displayed.
FOUR COLOR STATIC	The virtual light is split into four parts and four colors are displayed.
ONE COLOR FADE	For all FADE programs, the whole color palette of four colors is used. Those colors are faded in and out one by one. Here, the whole virtual light shows the same color.
TWO COLOR FADE	The virtual light is split and shows two colors at a time.
THREE COLOR FADE	The virtual light is split and shows three colors at a time.
FOUR COLOR FADE	The virtual light is split and shows four colors at a time.
SIMPLE RUNNING	A running light; the background and the running pixels color can be set.
DOUBLE RUNNING	Two pixels are running in opposite direction.
TWO COL RUNNING	The two pixels are of different color even.
FLAG RUNNING	A three color flag is running over the background color.
DOUBLE FLAG RUNNING	Two flags are running over background in opposite direction.
SPIRAL 4 COLORS	The color is changed pixel by pixel. All four colors are used one after the other.
SPIRAL 2 COLORS	The color changes between color 1 and 2 from the outside to the inside, pixel by pixel.
RAINBOW	A rainbow effect is displayed.
FIRE	The fire effect is a random flicker between two colors, background and flickering color.

EX1004, 21.

The Astera Manual explains that “[y]our light has a built in standalone engine. It can display static colors or replay a number of predefined effect patterns with a customizable color palette.” EX1004, 24. The “standalone engine” is within the lighting device, although no further details on its components or functionality are disclosed by the Astera Manual.

Using the AsteraApp™ (which runs from a mobile device, such as a smart phone or tablet), purportedly expands this functionality. EX1004, 23 (“[t]he buttons of the AX10 only allow a basic operation of the light. To gain full control over all features, the AsteraApp™ should be used.”) Specifically, the Astera Manual discloses that lighting “effects can be created and be sent to the light.” EX1004, 24. Once selected, “[t]he effects are...triggered and then each light replays them autonomously until a new effect is sent.” *Id.*

The Astera Manual discloses customizability of the effects within the AsteraApp™. EX1004, 27. Specifically, aspects of the effect like “speed”, “crossfade”, and “brightness” can be adjusted to customize the lighting effect. *Id.*

While the effects may be customized or adjusted by a user, the lighting effects are all based on pre-defined patterns. In particular, the Astera Manual discloses that “[t]he effects’ patterns are pre-defined and cannot be modified by the user. ***They are pre-programmed inside of each light.*** Still they can be parameterized.” EX1004, 28.³ Essentially, the Astera Manual discloses two capabilities: (1) the ability to replay, on a loop, a series of pre-programmed effect patterns, and (2) the ability to modify the playback parameters of the effect pattern *e.g.*, the playback speed. This modification of the playback parameters of the Astera Manual’s effects, however,

³ Unless noted otherwise, emphasis in quotations has been added.

does not change the underlying effect pattern and it does *not* involve a calculation, as further explained below.

B. Astera Does Not Disclose “Calculating, Using an Effect Simulator, a Time Varying Lighting Value”

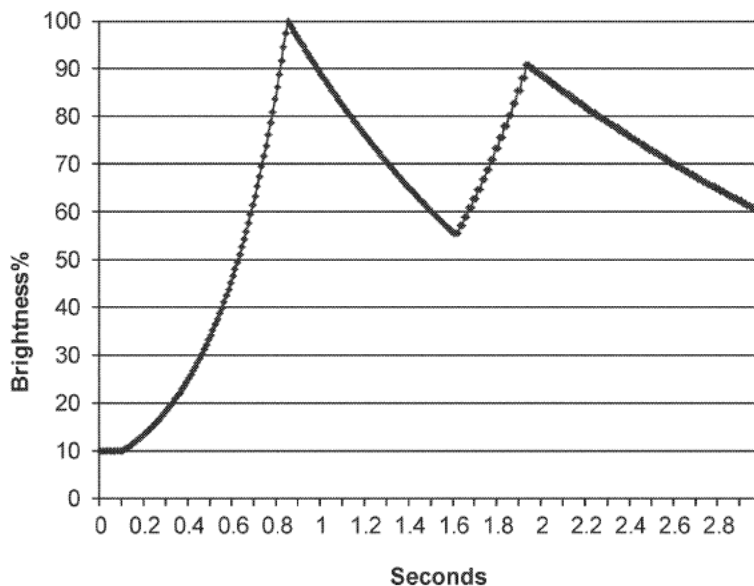
1. Petitioner mischaracterizes the Astera Manual’s pre-recorded effects as “calculating.”

The Astera Manual does not disclose the “calculating” limitations of the independent claims because the Astera Manual only discloses replaying pre-defined lighting values. Replaying pre-defined patterns is distinct from “calculating ... a time varying lighting value” (cls. 1, 19) or “calculate a time varying lighting value” (cl. 12). The Astera Manual discloses a lighting system capable of “display[ing] static colors or replay[ing] a number of predefined effect patterns with a customizable color palette.” EX1004, 24. The Astera Manual also discloses customizing the available lighting effects using the AsteraApp™, but customizing does not alter the underlying pattern, and is therefore distinguishable from the “calculating” limitation required by the claims of the ’044 patent. *Id.*, 27; EX2002, ¶129.

The Astera Manual explains there are limitations on the effects generation functionality by stating that “[t]he effects’ patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light.” EX1004, 28. The Astera Manual merely discloses recalling and replaying pre-defined effects, or

time varying lighting values, rather than calculating those time varying lighting values. EX2002, ¶130. On the other hand, the '044 patent effect simulator, in “calculating ... a time varying lighting value,” creates data that is later output as a lighting effect. '044 patent, 7:28-36; EX2002, ¶¶130-131.

In the '044 patent, as an example, assume that FIG. 7, reproduced below, shows the time varying brightness output of a lighting device simulating a fire effect:



'044 Patent, Fig. 7.

When the Astera Manual discloses outputting the fire effect, a POSITA would have understood that each of the points on the above graph (disclosing a brightness percentage output at a time) are pre-programmed into the controller (EX1004, 27), and merely sequentially recalled to simulate fire. EX2002, ¶136. That is, 0.9 seconds into the fire simulation, the Astera controller retrieves from memory the appropriate

brightness percentage for that time – here, 100%. *Id.* Conversely, the '044 Patent discloses “calculating” that lighting value. *Id.* When a device according to the '044 Patent outputs a fire effect, the effects simulator uses an algorithm to create the data point (0.9s, 100% brightness). *Id.* That algorithm is differentiated in the specification of the '044 Patent from prior art systems that merely replay pre-recorded patterns. See '044 Patent, 9:42-10:29. In particular, the algorithm disclosed in the '044 Patent is distinct from systems, like that disclosed in the Astera Manual, that “simply sampl[e] the intensity of a real flame and replay[] it.” '044 Patent, 10:5-6; see also EX2002, ¶¶78-98, 133-136.

With the device disclosed in the Astera Manual, that data point already exists – it was selected or recorded ahead of time and loaded into the Astera lighting device's memory. With a device according to the '044 Patent, that data point did not exist until it was calculated by the effect simulator. That effect simulator functionality is not disclosed in the Astera Manual. EX2002, ¶¶132-136.

Petitioner cannot and does not provide any citation to the Astera Manual that supports that the Astera Control Panel and the AsteraApp “calculate values,” despite making that contention. Adjustments of parameters for a predefined effect are not the creation of data. Nothing in the Astera Manual, including on pages 17 and 20-21, suggests a Control Panel that “creates data” or otherwise calculates a time varying lighting value. Recalling and replaying pre-defined effects does not disclose

“calculating, using an effect simulator, a time varying lighting value.” EX2002, ¶¶137-138.

Instead, page 17 of the Astera Manual discusses different modes for controlling the color output of the lighting device. EX1004, 17. Pages 20 and 21 discuss the functionality of the “predefined patters [sic]” and “predefined programs,” for example, how to group multiple lights together to form a “virtual big light” for outputting effects. *Id.*, 20-21. So, the sections of the Astera Manual that are cited as teaching the creation of data do nothing more than discuss the recalling and replaying of pre-defined patterns. *See, e.g.*, EX1004, 28; EX2002, ¶¶138-140.

The Astera Manual discloses a pre-defined pattern that looks random to a user, but not a random pattern that involves a calculation within the meaning of the '044 Patent's claims. EX2002, ¶139 (explaining a POSITA would have understood the “fire effect” simply appears random to a user because it is in the “predefined pattern” table and the Astera Manual does not provide any further description).

Petitioner's assertions of the Astera Manual's disclosure as it relates to the calculating limitation are fundamentally incorrect. POSITA would have understood that the Astera Manual's effects are pre-defined, because that is how the manual expressly and repeatedly discusses the lighting effects. *See* EX1004, 10 (the “standalone engine...can display static colors or replay a number of predefined effect patterns), 24 (same), 20 (“Select one of the predefined pattern[s]”), 21 (“The

predefined programs may use more than one pixel”), 28 (“effect patterns are predefined and cannot be modified”). A POSITA would understand these descriptions to disclose simply recalling and replaying predefined patterns, not “calculating.” EX2002, ¶142.

Petitioner ignores this distinction and instead submits conclusory statements about how an anticipatory prior art reference would have to work in order to anticipate the '044 Patent. The Astera Manual is not an anticipatory reference, at least because the Astera Manual effects are pre-defined. The '044 Patent describes effects where each next value is actively calculated, without relying on a pre-recorded pattern, and thus distinguishes over the Astera Manual. EX2002, ¶143.

2. Petitioner mischaracterizes Astera's ability to adjust parameters of pre-recorded effects as “calculating,” which it is not.

Petitioner argues that the ability to customize the Astera Manual's pre-defined effects patterns constitutes “calculating,” stating that “selected effects can ‘be highly customized’ by adjusting parameters.” Pet. 19. The Astera Manual's customization of pre-recorded effects, however, does not involve “calculating” time varying lighting values as described in the '044 patent. EX2002, ¶146; see also Section IV.A., (explaining “calculating” in the '044 patent).

Petitioner fails to point to any explicit disclosures in the Astera Manual that teach or describe “calculating.” Petitioner also fails to explain why a POSITA would

have understood the Astera Manual to necessarily disclose “calculating.” For instance, while Petitioner’s expert, Mr. Smith, opines that “[t]he recalled parameters are used to calculate the time varying lighting value,” EX1003 ¶81, nothing in the cited pages of the Astera Manual explains how adjusting parameters of the effects requires any calculation. *See* EX2002, ¶147.

While Petitioner cites to the Astera Manual’s statement that “with the AsteraApp™ these effects can be created and be sent to the light by the built in UHF receiver” (EX1004, 24, *see* Pet. 21), the Astera Manual makes clear that no “calculation” is performed to create the effects—they are merely parameterized. EX1004, 28 (“[t]he effects’ patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light. Still they can be parameterized.”); EX2002, ¶148.

The specification of the ’044 Patent distinguishes its algorithmic generation capabilities from prior art systems because they merely allow for customization of pre-recorded patterns. EX2002, ¶149. For example, the specification of the ’044 Patent states “[g]enerating the light output with the simulation provides a greater level of user adjustment and control than that produced by simply sampling the intensity of a real flame and replaying it at different speeds.” ’044 patent, 10:3-6. Customization of pre-recorded values (as disclosed in the Astera Manual) does not anticipate “calculating, using an effect simulator, a time varying lighting value.”

While a user may adjust the playback speed, color, or overall intensity of a pattern in the Astera Manual, the underlying pattern is not actually changed – thus, further demonstrating no calculation is performed. Claims 1, 12 and 19 of the '044 Patent are not anticipated by the Astera Manual. EX2002, ¶¶150-152.

C. Astera Does Not Anticipate The Dependent Claims

Claims 2-11 and 13-18 depend from independent claims 1 and 12 discussed above. These claims are distinguishable over Astera at least for the reasons discussed above regarding claims 1 and 12, including that Astera does not disclose the calculating limitation. Claims 2-11 and 13-18 are thus not anticipated by Astera at least due to their dependence from claims 1 and 12.

D. Petitioner's Obviousness Arguments Also Fail

Petitioner fails to provide an element-by-element obviousness analysis, and resorts primarily to conclusory assertions that differences “would have been obvious to a POSITA based on the same evidence that supports anticipation.” Pet. 34.

Petitioner interprets *Real Time Data* as allowing the Board to find claims obvious where a Petitioner asserts, but does not succeed, on an anticipation ground. See Pet. 34-35. This reading of *Real Time Data* is wrong. In *Real Time Data*, the Board's conclusion that the claims at issue were unpatentable on obviousness grounds was upheld by the Federal Circuit where the Petitioner *also proved anticipation*. *Real Time Data v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019).

Essentially, where anticipation is shown, and both anticipation and obviousness are asserted, the Board may hold the claims unpatentable based on either ground.⁴ Nothing in the holding suggests obviousness, without adequate analysis, may fill in for an unsuccessful anticipation bid.

Petitioner argues the '044 Patent does not provide specifics regarding how the calculation is performed. Pet. 35-36. Petitioner is wrong. The '044 Patent provides at least two examples of algorithms that produce time varying lighting values. One passage explains a sequence of instructions to simulate fire. EX1001, 9:40-10:29. Another passage provides a sequence of instructions to simulate lightning. EX1001, 9:7-16, 10:47-11:8. These passages describe the steps of an “algorithm,” and the absence of computer code is immaterial because a POSITA would have understood how to implement these algorithms. *See, e.g., In re Sherwood*, 613 F.2d 809, 816-17 (C.C.P.A. 1980) (disclosure of specific code not required; the level of disclosure required for computer programs is relative to the level of skill in the art). Indeed, Dr. Bretschneider's Declaration confirmed that the '044 Patent discloses an algorithm.

⁴ In this factual context, the Court's statement that “anticipation is the epitome of obviousness” makes sense – where anticipation is shown, so too is obviousness. *Real Time Data*, 912 F.3d at 1373 (internal quotations and citations omitted).

EX2002, ¶¶86-90 (e.g., ¶88 (the “algorithm [at 9:40-10:29] provides an example demonstrating how the effect simulator *calculates a time varying lighting value*”))).

Dr. Bretschneider explains that a POSITA would have understood parameterizing a predetermined or pre-recorded pattern (e.g., modifying the playback speed or changing the brightness) simply involves an adjustment to the pre-recorded values, but not a “calculation” of time varying lighting values. EX2002, ¶93. Petitioner's citations to Dr. Bretschneider's deposition do not undercut this testimony. Pet. 36 (citing to portions of Dr. Bretschneider's deposition answering questions about what is shown in FIGS. 3 and 7, but not discussing other passages in the '044 Patent discussed herein or whether parameterizing pre-recorded patterns means a calculation must occur). Dr. Bretschneider's opinions and testimony explained that the effect simulator of the '044 Patent uses an algorithm to calculate a time varying lighting value based on the simulation parameter. *See, e.g.*, EX2002, ¶¶85-90, 94, 136, 149; EX1008, 155:19-22 (“Q: Okay. Would there be some type of algorithm stored that would take these parameters and generate the effect? A: Yes.”); EX1008, 157:10-20 (testifying that a POSITA would understand there would be different algorithms, or sub-routines, for different lighting effects).

Petitioner's arguments that Astera's conversion of manual inputs to output lighting values would be a “calculation,” *see, e.g.*, Pet. 36, would suggest that any processing of data or analog circuitry that converts manual inputs to output lighting

values involves a calculation. But, as discussed previously, the '044 Patent distinguishes its algorithmic generation capabilities from prior art systems because they merely allow for customization of pre-recorded patterns. EX2002, ¶149. For example, the specification of the '044 Patent states “[g]enerating the light output with the simulation provides a greater level of user adjustment and control than that produced by simply sampling the intensity of a real flame and replaying it at different speeds.” '044 patent, 10:3-6. Customization of pre-recorded values (as disclosed in the Astera Manual) does not anticipate “calculating, using an effect simulator, a time varying lighting value.” While a user may adjust the playback speed, color, or overall intensity of a pattern in the Astera Manual, the underlying pattern is not actually changed – thus, further demonstrating no calculation is performed.

Petitioner also argues that Astera “describes multiple random effects that a POSITA would understand are not pre-recorded, such as ‘fire,’ ‘strobe,’ and ‘chaser.’” Pet. 37. Petitioner’s speculation as to “randomness” is unsupported and incorrect. A lighting effect can appear random by the light outputting a set of pre-stored lighting values with no discernable pattern; with a sufficiently large set of unrelated (*e.g.*, random-appearing) values, this pre-stored but random-appearing effect will not repeat. *See* EX2002, ¶139; EX1008, 188:22-189:11. Further, the '044 Patent itself also discusses exactly this type of system where user inputs are taken to produce lighting effects such as “fire” with time varying brightness

patterns—and then explains that the effect simulator of this application is distinct from this known setup because it calculates time varying lighting values. EX1001, 1:24-42, 5:41-63, 10:3-6. Petitioner's generic statements relying on Astera's disclosure and hindsight bias are insufficient to show why one of ordinary skill in the art would have altered Astera in the manner necessary to arrive at the inventions claimed in the '044 Patent.

VIII. Edwards Fails to Anticipate or Render Obvious Claims 1-19 (Grounds 3-4)

Edwards does not anticipate or render obvious the Challenged Claims of the '044 Patent.

A. Overview of Edwards

U.S. Patent No. 9,743,010 to Edwards ("Edwards") generally relates to a method and system for synchronizing LED lighting to the shutters of fast digital cameras. EX1006, Abstract. In particular, Edwards focuses on synchronizing changes in lighting to the camera shutter for videos and motion pictures to enable all lighting transitions to be done between frames. EX1006, 1:25-28. This synchronization is done to obtain a clean image capture, free of artifacts that occur when lighting changes in the middle of a frame. EX1006, 1:28-30.

To achieve the desired synchronization, Edwards describes programming the intensity value of each of the light fixtures to change while the camera shutters are

closed. EX1006, 1:44-54. Edwards' invention further purports to be "a new type of motion picture control system that utilizes synchronized control of both high speed digital motion picture cameras and digital LED lighting systems to enable multiple 'lighting schemes' to be filmed simultaneously." EX1006, 3:13-18.

Edwards explains that these "lighting schemes" may be implemented using commands. EX1006, 7:20-22. That is, a control panel on each light or DMX commands may be input by a cinematographer using a "SETUP" command to adjust the light color, color temperature, and dimming of each light fixture. EX1006, 7:22-31. The cinematographer may then use a "STORE" command to save the light scheme settings. EX1006, 7:32-37. This allows for the light schemes to be sequentially replayed when the cinematographer provides a "RECORD" command (*i.e.*, to start filming with the desired lighting). EX1006, 7:54-58. Edwards provides an example of a cinematographer inputting light schemes "1, 3, and 5" such that these light schemes occur sequentially, with the change between schemes synchronized to the camera shutter. EX1006, 7:54-8:1.

Edwards discloses several other aspects and embodiments of the lighting system. Pertinent to the discussion below, Edwards describes an ability for a board operator to use a DMX console to adjust the lighting of each video track in real time. EX1006, 11:18-24. Edwards provides an example of dimming and increasing a spot light in real time on just one track using the DMX address of the

track. EX1006, 11:24-26.

Further, Edwards explains that “[i]n film and broadcast lighting there are frequently times when dynamic lighting is used as a special effect, editing element or to simulate an environment in film.” EX1006, 11:33-35. Edwards then provides several examples of these dynamic lighting special effects, such as lightning, gun shot, a flashing sign, or a fire. EX1006, 11:37-53.

B. Edwards Does Not Disclose “Calculating, Using an Effect Simulator, a Time Varying Lighting Value”

For Grounds 3 and 4, the Petition and Smith Declaration assert both anticipation and obviousness based on Edwards alone (*i.e.*, no other reference is combined with Edwards). Petition, 4; EX1003, ¶¶169-240.

The Petition and Smith Declaration do not articulate an obviousness ground based on Edwards for the independent claims. Accordingly, Ground 4 fails and institution should be denied. Further, Petitioner has not shown a reasonable likelihood of prevailing on its contention that Edwards anticipates the “calculating” limitation of independent claim 1, as well as the corresponding “calculate” and “calculating” limitations of independent claims 12 and 19, respectively.

1. No Obviousness Analysis Presented

As an initial matter, while Grounds 3 and 4 (based on Edwards) is described in the Petition as brought under 35 U.S.C. §§102/103 (Petition, 3), the Petition does not

set forth any proper obviousness analysis. Petitioner has not assessed or identified the differences between Edwards and the claims of the '044 Patent. Nor has Petitioner articulated any reason for modifying the Edwards reference to arrive at the claimed invention. Petitioner merely states that any differences “would have been obvious to a POSITA based on the same evidence that supports anticipation.” Pet. 60. Such conclusory assertions are plainly inadequate.

The Petition, therefore, does not demonstrate that claims 1, 12, and 19 would have been obvious based on Edwards for the same reasons explained below regarding anticipation and because no further obviousness analysis was presented in the Petition. EX2002, ¶¶190-193; *see DSS Tech. Mgmt., Inc. v. Apple Inc.*, 885 F.3d 1367 at 1374-77 (Fed. Cir. 2018) (reversing a finding of obviousness where Petitioner failed to provide reasoned explanation for motivation to modify reference); *Lindsay Corp. v. Valmont Indus., Inc.*, IPR2016-01387, Paper 7 at 9-11 (PTAB Jan. 9, 2017) (denying institution where Petitioner failed to “allege [the] reference does not disclose a limitation, but it would have been obvious to modify [the reference], or provide other analysis that bears the hallmarks of an obviousness analysis”).

Therefore, the Petition and the Smith Declaration do not demonstrate that claims 1, 12, and 19 would have been obvious based on Edwards.

For completeness, and in order to respond to the conclusory obviousness position asserted in the Petition, even if a proper obviousness analysis had been

presented, a POSITA would not have found claims 1, 12, and 19 obvious in view of Edwards. EX2002, ¶94. For example, the missing claim limitation discussed below would not have been obvious to introduce by a POSITA into the Edwards lighting system because of the complexity and unique functionality that is incompatible with that shown in Edwards. *Id.*

2. Edwards Does Not Disclose “Calculating, using an Effect Simulator, a Time Varying Lighting Value”

The Petition misstates the actual teachings of Edwards with respect to the calculating limitation. A POSITA would have understood that Edwards' system does not calculate a time varying lighting value based on the recalled simulation parameter.

Petitioner argues both that user-input “schemes” require a “calculation” and that adjusting the timing of these schemes also requires a calculation. Pet. 43-45. These arguments both fail because Petitioner incorrectly asserts: (i) user-input data, which “d[id] not exist,” is necessarily calculated; and (ii) using a sync signal to output data requires calculating. *See* Pet. 44-45 (“Critically, schemes do not exist until users provide their desired input parameters” and a synchronizing “timing adjustment requires a ‘calculation’”). Petitioner has not met its burden of showing that the claims of the '044 Patent are anticipated by Edwards.

a) Inputting lighting values does not constitute “calculating” a time varying lighting value

Petitioner first argues that Edwards discloses the “calculating” limitation because it receives user input “light levels, color temperature, and dimming” to create “lighting schemes.” Pet. 43-44. But where a user inputs specific lighting values, the output of those values does not require a calculation as Petitioner alleges – it merely requires playing what the user input. See EX2002, ¶¶182, 186-87 (distinguishing manual inputs recalled and output from the claimed calculating limitation of the '044 Patent).

The '044 Patent illustrates that merely converting user inputs to signals the lighting device can execute is *not* “calculating ... a time varying lighting value.” See EX1001, 8:27-39 (describing the converter that receives the data 106 *from* the effect simulator 102), FIG. 2. In particular, the '044 Patent describes a “converter” (which converts the time varying lighting values generated by the effect simulator into a form that the lighting device can process) as a distinct component from the “effect simulator” which *calculates time varying* lighting values. See EX1001, 8:27-39, FIG. 2. Indeed, these components are even separately claimed. See *id.*, cl. 9 (further illustrating that converting signals is *not* “calculating ... a time varying lighting value”).

In Edwards, all that happens is lighting values are entered by a user (to define a “scheme”), stored, and recalled. For example, Edwards explains “the cinematographer adjusts each light until he/she has the desired setting on all lights for the ‘lighting scheme,’” after which “all lights would prepare to replay” the schemes. EX1006, 7:23-25, 7:57. In particular, Edwards explains the cinematographer uses “either the control panel on each light or [] DMX commands” to setup a lighting scheme. EX1006, 7:22-23. These input parameters include color and brightness. *See id.*, 7:25-31. The lighting scheme is stored and then recalled and played. *See id.*, 7:32-53 (explaining the STORE command), 7:54-8:1 (explaining the RECORD command which “replay[s]” the schemes).

This is akin to the conventional setup that the '044 Patent distinguishes from the claimed effect simulator. *Compare* EX1001, 5:41-53 (describing FIG. 1 and explaining the DMX distribution hub 302 and analogue effect simulator 300 can be used to produce “data 106 such as brightness parameters that vary over time”) *with id.*, 5:54-6:10, 7:19-36, 9:57-10:2 (explaining some of the benefits of using an “effect simulator” to provide a less expensive, realistic simulation). Accordingly, by simply receiving, storing, and recalling user input brightness and color values, the Edwards' schemes function in a fundamentally different way than the claimed effect simulator, which calculates a time varying lighting value.

The calculation of a “time varying lighting value” claimed in the '044 Patent is not the mere conversion of a user input to the actual values sent to the LEDs. Rather, the independent claims of the '044 Patent require calculation of “lighting values” such as brightness and color data. Petitioner's argument that Edwards converts user input “light levels, color temperature, and dimming” into “lighting values that are transmitted to lighting devices” (Pet. 44) fails to establish Edwards discloses calculation of time varying lighting values.

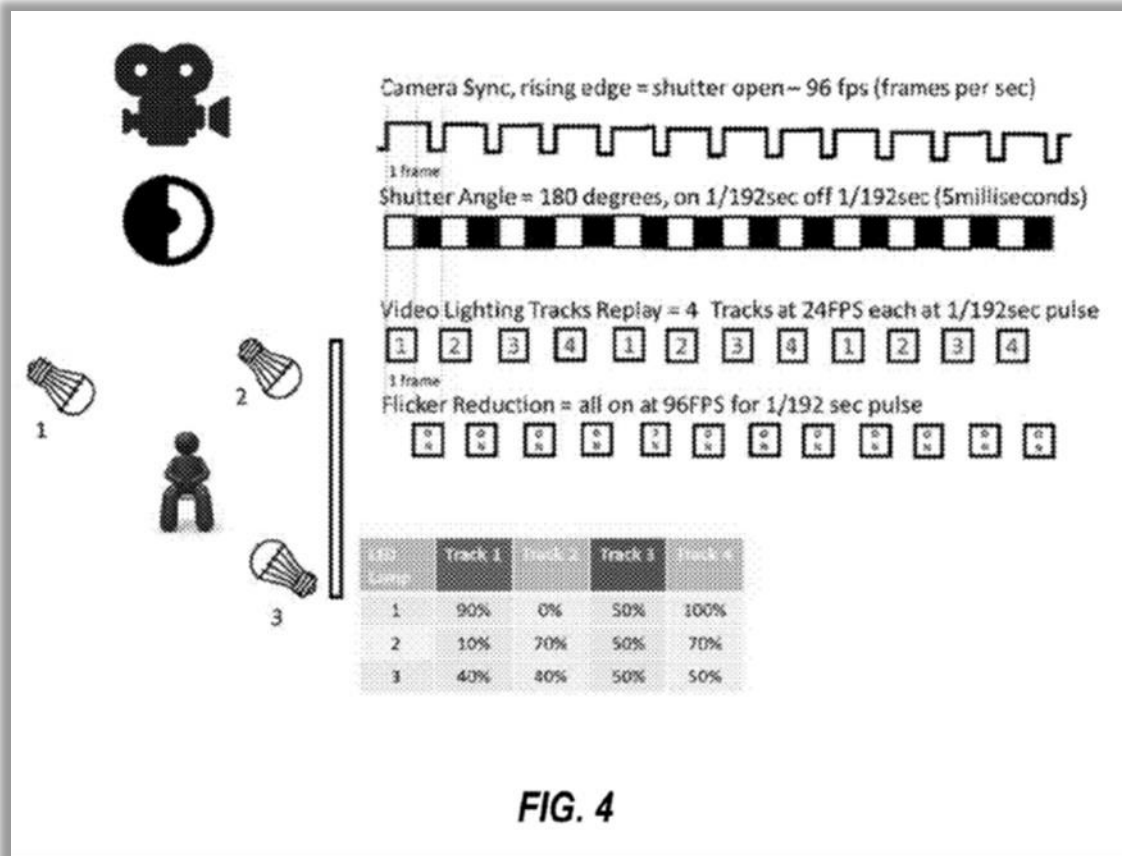
b) Adjusting the timing of a replayed scheme, through sync signals, does not constitute calculating

Petitioner's second argument – that application of sync signals to pre- defined lighting schemes requires a calculation (Pet. 44-45) – fails because sync signals merely synchronize the timing of the output of pre-defined lighting schemes. Petitioner has not met its burden of showing timing adjustments require calculation. Nor has Petitioner established that the use of sync signals results in calculating time varying lighting values.

Petitioner argues that if a sync signal were applied to the lighting pattern disclosed in the '044 Patent's FIG. 7, “the graph would change,” assuming, essentially, that any change in the graph indicates a calculation. Pet. 45. This assumption is incorrect. FIG. 7 merely represents the output of a calculated time varying lighting value. In a vacuum, it could also represent the output of a pre-

recorded time varying lighting value, one that *does not require a calculation* to generate. Accordingly, changing the graph does not indicate a calculation, since the graph alone does not establish whether a calculation was used to generate it. Further, simply adjusting the timing of the lighting effect portrayed in the graph (*e.g.*, applying a sync signal to the defined effect) would not necessitate a calculation. No calculation is needed to adjust the playback timing of a pre- defined effect and doing so does not *create* a new time varying lighting value. *See* EX2002, ¶181.

In Edwards, no calculation is required to synchronize the lighting transitions to the frame rate of the camera. The lights of Edwards simply “wait for the rising edge of the sync signal to trigger turning on each scheme frame,” (EX1006, 7:58-60) as shown in FIG. 4, below.



EX1004, FIG. 4. Holding the next transition of a pre-defined lighting effect until the camera shutter is closed does not require a calculation. EX2002, ¶181.

The Challenged Claims are fundamentally different from Edwards because the Challenged Claims involve an extra aspect that is not present in Edwards—calculating the time varying lighting value based on the recalled user input simulation parameter. EX1001, cls. 1, 12, 19; EX2002, ¶¶183-184. Edwards does not involve a user inputting a particular simulation parameter, followed by an effect simulator calculating a time varying lighting value based on that recalled

user input simulation parameter. Instead, Edwards requires a user to input a lighting scheme, store it, and replay the stored lighting scheme. EX1006, 7:20-8:1. There is no calculation of a time varying lighting value. EX2002, ¶185.

Accordingly, Edwards does not anticipate the calculating limitations in claims 1, 12, or 19. For at least these reasons, Edwards does not anticipate any of the independent claims of the '044 Patent. EX2002, ¶188.

C. Edwards Does Not Anticipate The Dependent Claims

Claims 2-11 and 13-18 depend from independent claims 1 and 12 discussed above. These claims are distinguishable over Edwards at least for the reasons discussed above regarding claims 1 and 12, including that Edwards does not disclose the calculating limitation. Claims 2-11 and 13-18 are thus not anticipated by Edwards at least due to their dependence from claims 1 and 12. EX2002, ¶189.

IX. Conclusion

For the reasons set forth above, Petitioner has failed to demonstrate a reasonable likelihood that it would prevail with respect to Challenged Claims 1-19. Therefore, *Inter Partes* review of the '044 Patent should be denied.

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Respectfully submitted,
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CERTIFICATE OF WORD COUNT UNDER 37 C.F.R. § 42.24(B)(1)

I, the undersigned, do hereby certify that the foregoing Patent Owner Preliminary Response, including footnotes, contains no more than 14,000 words, as measured by the Word Count function of Microsoft Word. This is less than the limit of 14,000 words as specified by 37 C.F.R. § 42.24(b)(1).

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CERTIFICATE OF SERVICE

I hereby certify that on this 30th day of October 2023, a true and correct copy of the foregoing PATENT OWNER'S PRELIMINARY RESPONSE was served by electronic mail upon the following counsel of record for Petitioners:

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