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

CONSTELLATION DESIGNS, LLC, **Plaintiff,** **v.** **LG ELECTRONICS INC.,** **LG ELECTRONICS U.S.A., INC., AND** **LG ELECTRONICS ALABAMA, INC.** **Defendants.**	Civil Action No. 2:21-cv-448-JRG **JURY TRIAL REQUESTED**

LG'S FINAL ELECTION OF ASSERTED PRIOR ART

Pursuant to the Court's Order Focusing Patent Claims and Prior Art (Dkt. 39), Defendants LG Electronics Inc., LG Electronics U.S.A., Inc., and LG Electronics Alabama, Inc. (collectively, "LG") hereby disclose their Final Election of Asserted Prior Art for the claims of the U.S. Patent No. 8,842,761 (the "'761 patent"), U.S. Patent No. 10,567,980 (the "'980 patent"), U.S. Patent No. 10,693,700 (the "'700 patent"), U.S. Patent No. 11,019,509 (the "'509 patent"), U.S. Patent No. 11,018,922 (the "'922 patent"), U.S. Patent No. 9,743,290 (the "'290 patent"), and U.S. Patent No. 11,039,324 (the "'324 patent") (collectively, the "Asserted Patents") elected by Plaintiff Constellation Designs, LLC ("CD") on January 4, 2023. [*See* Mar. 7, 2023 5:53 PM EST Email fr. B. DeFeo ("Constellation Designs v LG, 2:21-cv-448-JRG (EDTX) - Final Election of Asserted Claims").]

LG reserves the right to modify its election of asserted art, including to the extent CD modifies or amends its Infringement Contentions and/or asserted claims, subject to and in accordance with the Court's Local Rules and any Orders issued by the Court.

LG's identification of prior art references is intended to reduce the number of prior art references with respect to invalidity theories under 35 U.S.C. § 102(a), (b), and (e) and 35 U.S.C. § 103. LG's identification of prior art references is not intended to limit other invalidity theories and/or ineligibility theories, including but not limited to theories based on 35 U.S.C. §§ 101 and 112, derivation, and/or incorrect inventorship. LG reserves the right to assert these additional invalidity and ineligibility theories notwithstanding the reduction of prior art identified herein. LG also reserves the right to discuss additional prior art references, including but not limited with respect to discussing the background state of the relevant art, discussing features admitted by the patentee to be prior art, describing the ATSC 3.0 standardization processes, and showing a motivation to combine references for 35 U.S.C. § 103 obviousness theories.

Final Election of Prior Art

For each of the Asserted Patents, LG elects the prior art references listed below.

Patent	Final Prior Art Elections
U.S. Patent No. 10,567,980	• De Gaudenzi 1 • De Gaudenzi 1 + Chindapol • De Gaudenzi '663 • De Gaudenzi '663 + Chindapol • Ngo 2 • Ngo 2 + Chindapol
U.S. Patent No. 8,842,761	• De Gaudenzi 1 • De Gaudenzi 1 + Chindapol • De Gaudenzi '663 • De Gaudenzi '663 + Chindapol • Ngo 2 • Ngo 2 + Chindapol
U.S. Patent No. 10,693,700	• De Gaudenzi 1 • De Gaudenzi 1 + Zhang • DVB S2 • DVB S2 + De Gaudenzi 1 • DVB S2 + Zhang

Patent	Final Prior Art Elections
U.S. Patent No. 11,019,509	• Ngo 2 • Ngo 2 + Zhang • Ngo 2 + Zhang + De Gaudenzi 1 • Bauch • Bauch + Zhang • Bauch + Zhang + De Gaudenzi 1
U.S. Patent No. 11,018,922	• Stadelmeier + A/322:2016 + Loghin • Shen '791 + Thomson 1 + Cronie 2007 • Shen '791 + Thomson 1 + Cronie 2007 + De Gaudenzi 1 • Shen '791 + Thomson 1 + Cronie 2007 + Sommer • Shen '791 + Thomson 1 + Cronie 2007 + Ngo 2 • Shen '791 + Thomson 1 + Cronie 2007 + Fitz
U.S. Patent No. 9,743,290	• Stadelmeier + A/322:2016 + Loghin • Ko + Thomson 1 + De Gaudenzi 1 • Ko + Thomson 1 + Fitz • Shen '791 + Thomson 1 + De Gaudenzi 1 • Shen '791 + Thomson 1 + Fitz • Shen '791 + Thomson 1 + Sommer
U.S. Patent No. 11,039,324	• Stadelmeier + A/322:2016 • Stadelmeier + A/322:2016 + A/327:2018 • Ko + Thomson 1 + De Gaudenzi 1 • Ko + Thomson 1 + Fitz • Shen '791 + Thomson 1 + Cronie 2007 • Shen '791 + Thomson 1 + Fitz

The prior art references listed above correspond to the following:

- De Gaudenzi et al., Turbo-coded APSK modulations design for satellite broadband communications, Wiley InterScience ("De Gaudenzi 1")
- U.S. Patent No. 7,123,663 to De Gaudenzi et al. ("De Gaudenzi '663")
- Chindapol et al, Design, Analysis, and Performance Evaluation for BICM-ID with Square QAM Constellations in Rayleigh Fading Channels, IEEE Journal on Selected Areas in Communications, Vol. 19, No. 5 ("Chindapol")

- Ngo et al., A New Iterative Decoder for Turbo Codes on the Nonlinear Channel with Non-uniform 16QAM Modulation, Turbo-Coding-2006 ("Ngo 2")
- ETSI EN 302 307 V1.1.2, Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications ("DVB S2")
- U.S. Patent No. 7,173,978 to Zhang et al. ("Zhang")
- Bauch et al., Turbo modulation and coding: Design and evaluation of iterative bit-interleaved coded modulation methods for wireless systems beyond 3G, Wiley InterScience ("Bauch")
- Barsoum, Jones, Fitz, Constellation Design via Capacity Maximization, ISIT2007, Nice, France ("Fitz")
- International Published No. WO 2014/195303 A1 to Stadelmeier et al. ("Stadelmeier")
- ATSC Standard: Physical Layer Protocol, Doc. A/322:2016, dated Sept. 7, 2016 ("A/322:2016")[1]
- ATSC Recommended Practice: Guidelines for the Physical Layer Protocol, Doc. A/327:2018, dated Oct. 2, 2018 ("A/327:2018")
- U.S. Patent Application Publication No. 2004/0252791 to Shen et al ("Shen '791")

[1] A/322:2016 is listed as a prior art reference for each of the '290, '922, and '324 patents. To the extent CD contests the prior art status of A/322:2016 with respect to any such patent, LG reserves the right to rely on a substantially similar version of this document, such as "ATSC Proposed Standard: Physical Layer Protocol (A/322)," Doc. S32-230r46, dated May 6, 2016, *see, e.g.*, CD-INC-0000445, CD-INC-0000701, or "ATSC Proposed Standard: Physical Layer Protocol (A/322)," Doc. S32-230r56, dated June 29, 2016, *see, e.g.*, LGCD_00031721.

- International Published No. WO 2009/150500 A1 (“Thomson 1”)
- Sommer et al., Signal Shaping by Non-Uniform QAM for AWGN Channels and Applications Using Turbo Coding (“Sommer”)
- Cronie, Superposition Coding for Power- and Bandwidth Efficient Communication over the Gaussian Channel, ISIT2007, Nice, France, June 24 - June 29, 2007 (“Cronie 2007”)
- Loghin et al., Non-Uniform Constellations for ATSC 3.0, IEEE Transactions on Broadcasting, Vol. 62, No. 1, pp. 197-2003, March 2016 (“Loghin”)
- U.S. Patent No. 8,503,550 to Ko et al. (“Ko”)

Date: March 14, 2023

Respectfully submitted,

By: /s/ *R. Andrew Schwentker*

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the above and foregoing document has been served on March 14, 2023 on all counsel of record via email.

/s/ R. Andrew Schwentker
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