

Minutes
Control Protocols Working Group
Wednesday, 01 May 2019
via WebEx

Chairmen:

Milton Davis, Doug Fleenor Design
Michael Lay, Signify

Recording secretaries: Richard J. Nix & Karl G. Ruling, ESTA

Members attending:

Paul Beasley; Walt Disney Company; P; U
Robert Bell; Acuity Brands Inc.; A; MP
Andrew Berry; X-Laser; P; MP
Scott M. Blair; Megapixel; P; CP
Eric Bloom; Westview Productions; P; DR
Javid Butler; Integrated Theatre, Inc.; O; CP
Edward R. Condit; Edward R. Condit; O; G
Milton Davis; Doug Fleenor Design, Inc.; P; MP
Bill Ellis; Candela Controls, Inc.; P; DE
Robert Goddard; Goddard Design Co.; P; MP
Mitch Hefter; USITT; P; U
Julian Hoare; Tait Towers Manufacturing LLC; A; MP
Jon Hole; Eaton; P; MP
John Huntington; I.A.T.S.E. Local 1; A; U
Leroy "Tripp" Oliver, III; Mainstage Theatrical Supply, Inc.; P; DR
John Valus_Jr.; Lex TM3; P; CP
Sam Kearney; Electronic Theatre Controls, Inc.; P; MP
Paul Kleissler; City Theatrical, Inc.; P; MP
Lucas Korytkowski; Insight Lighting; O; MP
Edwin S. Kramer; I.A.T.S.E. Local 1; P; U
Christian Krueger; Blizzard Lighting LLC; P; MP
Roger Lattin; I.A.T.S.E. Local 728; P; U
Michael Lay; Signify; P; MP
Kevin Loewen; Acuity Brands Inc.; P; MP
Jim Love; Tait Towers Manufacturing LLC; P; MP
Rob Love; Insight Lighting; O; MP
David McCulloch; David McCulloch; O; U
Daniel Murfin; Royal National Theatre; P; U
Simon Newton; Open Lighting Project; P; G
Maya Nigrosh; Sonos; P; MP
Jason Potterf; Cisco; P; MP
Larry Schoeneman; DesignLab Chicago, Inc.; P; DR
Peter Willis; Howard Eaton Lighting Ltd.; P; CP

Visitors: Erin Grabe; ESTA

1 Opening remarks

The meeting was called to order at 13:02 by Michael Lay. He thanked everyone for attending, and reminded people to mute microphones when not speaking.

2 Anti-trust and patent statements

2.1 Reading of the anti-trust statement

The following statement was read aloud to the assembly by Michael Lay:

ESTA and its members take seriously their obligation to comply with all applicable antitrust laws. Therefore, during this meeting and during all ESTA events, all discussions will be limited to those subjects that are permitted by the antitrust laws. All members should refrain from any discussion or mention of competitively sensitive subjects such as the current or future prices charged for any member product or services, current or future marketing plans or strategies, and current or future costs, including employee salaries. There also must be no agreement on the suppliers or customers that members will or will not do business with or the markets in which members will conduct business.

Violations of the antitrust laws can have serious consequences. If you have any questions or concerns about anything that is discussed at an ESTA meeting, please bring your concern to ESTA management. An easy to read pamphlet describing the antitrust laws is available from the ESTA staff.

Karl Ruling held up a copy of the easy-to-read pamphlet in front of his web-cam so people on-line could see it.

No concerns were expressed.

2.2 Reading of the call for patents

The following statement was read aloud to the assembly by Michael Lay:

ESTA intends not to publish any standard that contains protected intellectual property, unless that information can be licensed by anyone for a reasonable fee. ESTA uses a process of open patent and copyright disclosures to implement its intent. ESTA does not conduct patent or copyright searches and does not warrant that its standards contain no protected intellectual property.

In keeping with the open disclosures policy, I ask if anyone present wishes to notify this working group of the existence of a patent, patent application, copyright, or other protected intellectual property that might protect material in a standard being developed by this working group. You need not be the holder of the patent or copyright to notify this working group of its existence.

Nothing was revealed.

3 Attendance and Membership

3.1 Requirements for membership

The following statement was read aloud to the assembly by Michael Lay.:

Membership is open to all parties who are affected by the work of the group; membership in ESTA is not a requirement, but there is a \$100/person/year participation fee to help fund the costs of running the Technical Standards Program. Voting members are required to attend meetings and vote on letter ballots. Any principal member and alternate that both miss three consecutive meetings or that miss three consecutive letter ballots will have their membership status changed to observer. This action will be taken at the beginning of the first meeting after such inaction and will be recorded in the minutes of that meeting.

3.2 Introduction of attendees

Milton Davis read the names from the people listed by WebEx as on-line and asked them to introduce themselves.

3.3 Determination of a quorum

[There are currently 30 votes possible. A quorum is 11; a supermajority is 16.]

It was determined that more than 50% of the voting members were in attendance—more than enough people for a quorum or to pass a motion needing a supermajority.

3.4 Processing of new membership and status change requests

The following applications and status change requests have been received:

Tucker Downs; Megapixel VR; A; MP

David James McCulloch; David James McCulloch O; U

Cameron Affleck; English National Opera (ENO); O; U
 Chris Conti; PRG; O; DR
 Justin Bennett; University of the Incarnate Word; O; U
 Sean Goossen; LiteGear, Inc.; O; MP

Roger Lattin moved that the applications be accepted. The motion was seconded. The motion carried. There were no objections or abstentions.

3.5 Changes to observer status

3.5.1 Changes due to attendance

The following voters have missed the last two meetings and are in jeopardy of being moved to Observer status if this meeting is also missed:

Andrew Frazer; Stellasclapes; P; MP

Frazer was not in attendance, but earlier in the day he had submitted an email stating:

“I’ve really enjoyed the time i’ve spent with the CPWG, but after some evaluation, i’ve decided that I can’t really contribute effectively from the other side of the world.

“In that light, i’ve decided that it is appropriate that I resign from the CPWG as a voting member. I certainly have met some interesting people and learned a lot from you all.”

He was moved to observer status.

3.5.2 Changes due to missed letter ballots

There were none.

3.6 Consensus body

The full consensus voting body during this meeting was:

Name	Representing	Voting Status	Int Cat
Kevin Loewen	Acuity Brands Inc.	P	MP
Robert Bell	Acuity Brands Inc.	A	MP
Maurits van der Hoorn	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Holdings	P	DE
Christian Krueger	Blizzard Lighting LLC;	P	MP
Bill Ellis	Candela Controls, Inc.	P	DE
Brent Boulnois	Candela Controls, Inc.	A	DE
Jim Ohrberg	Candela Controls, Inc.	A	DE
Jason Potterf	Cisco	P	MP
Paul Kleissler	City Theatrical, Inc.	P	MP
Larry Schoeneman	DesignLab Chicago, Inc.	P	DR
Milton Davis	Doug Fleenor Design, Inc.	P	MP
Ian Campbell	Doug Fleenor Design, Inc.	A	MP
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	P	U
Jon Hole	Eaton	P	MP
Sam Kearney	Electronic Theatre Controls, Inc.	P	MP

Name	Representing	Voting Status	Int Cat
Eric Rasmussen	Electronic Theatre Controls, Inc.	A	MP
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Robert Goddard	Goddard Design Co.	P	MP
Peter Willis	Howard Eaton Lighting Ltd.	P	CP
Edwin S. Kramer	I.A.T.S.E. Local 1	P	U
John Huntington	I.A.T.S.E. Local 1	A	U
Roger Lattin	I.A.T.S.E. Local 728	P	U
Matthew Ardine	I.A.T.S.E. Local 728	A	U
David Kane	I.A.T.S.E. Local 728	A	U
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
Mark Primrose	Kino Flo, Inc.	P	CP
John Valus_Jr.	Lex TM3	P	CP
Leroy "Tripp" Oliver, III	Mainstage Theatrical Supply, Inc.	P	DE
Scott M. Blair	Megapixel	P	CP
Tucker Downs	Megapixel	A	CP
Simon Newton	Open Lighting Project	P	G
Daniel Murfin	Royal National Theatre	P	U
Bill McIntyre	Show Distribution Group, Inc.	P	CP
Michael Lay	Signify	P	MP
Maya Nigrosh	Sonos	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Julian Hoare	Tait Towers Manufacturing LLC	A	MP
Robert Haycock	UC Berkeley	I	U
Mitch Hefter	USITT	P	U
Paul Beasley	Walt Disney Company	P	U
Eric Bloom	Westview Productions	P	DR
Andrew Berry	X-Laser	P	MP
Total possible votes:			30
Votes by interest category	Custom-market producer	CP	5
	Designer	DE	2
	Dealer or rental company	DR	3
	General interest	G	1
	Mass-market producer	MP	12
	User	U	7

Voting Status key: P = Principal voter, A = Alternate voter, I = Individual voter
Int. Cat. key: CP=Custom-market Producer; DE=Designer; DR=Dealer/Rental company; G=General interest; MP=Mass-market producer; U=User

4 Approval of the minutes from the last meeting

See *CPmin01-2019_DRAFTTr1.pdf*

Kevin Leowen moved to approve the minutes as submitted. The motion was seconded. Mitch Heffer, Simon Newton, Bob Goddard, and Roger Lattin abstained. The rest were in favor. The motion carried.

5 Approval of agenda

The agenda must be approved, either as drafted or with modifications, by a vote of the working group.

Scott Blair moved to approve the agenda as submitted. The motion was seconded. The motion carried with no abstentions and no opposition.

6 Old Business

6.1 Standards, Guides & Recommended Practice Maintenance

This is a placeholder in the agenda, so we don't forget to maintain them. Documents prefaced with an asterisk () are on the agenda elsewhere for reports or action.*

Michael Lay directed meeting attendees to review the following list, and to speak up if there was anything needing action and not already on this meeting's agenda.

ANSI E1.3 – 2001 (R2016), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification & Application Guide For ANSI E1.3 – 2004 Lighting Control Systems 0 to 10V Analog Control Specifications. (Revision, reaffirmation or withdrawal by 17 February 2021)

ANSI E1.11 – 2008 (R2018), Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories. (Revision, reaffirmation, or withdrawal by 31 May 2023)

ANSI E1.17 – 2015 Entertainment Technology - Architecture for Control Networks (ACN) (Revision, reaffirmation, or withdrawal by 21 May 2020)

ANSI E1.20 - 2010, Remote Device Management over USITT DMX512. (Revision, reaffirmation or withdrawal by 4 January 2016 – PINS filed for revision)

ANSI E1.27-1 – 2006 (R2016), Entertainment Technology - Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A) Products. (Revision, reaffirmation or withdrawal by 8 April 2021)

*ANSI E1.27-2 – 2009 (R2014), Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products. (Revision, reaffirmation, or withdrawal by 9 June 2019)

ANSI E1.30-1 – 2010 (R2016), EPI 23, Device Identification Subdevice. (Revision, reaffirmation or withdrawal by 17 February 2021)

*ANSI E1.30-3 – 2009 (R2014), EPI 25, Time Reference in ACN Systems Using SNTP and NTP. (Revision, reaffirmation, or withdrawal by 9 June 2019)

ANSI E1.30-4 – 2010 (R2015), EPI 26, Device Description Language (DDL) Extensions for DMX512 and E1.31 Devices. (Revision, reaffirmation, or withdrawal by 25 September 2020)

*ANSI E1.30-10 – 2009 (R2014), EPI 32, Identification of Draft Device Description Language Modules. (Revision, reaffirmation, or withdrawal by 9 June 2019)

*BSR E1.30-11 - 201x, EPI 33, Transport of root PDUs over TCP

ANSI E1.31 - 2018, Lightweight streaming protocol for transport of DMX512 using ACN (Revision, reaffirmation, or withdrawal by 31 August 2023)

*E1.33 – 201x, Transport of ANSI E1.20 (RDM) in an E1.31 environment

ANSI E1.37-1 – 2012 (R2017), Additional Message Sets for ANSI E1.20, Remote Device Management. (Revision, reaffirmation, or withdrawal by 18 May 2022)

ANSI E1.37-2 - 2015, Additional Message Sets for ANSI E1.20 (RDM) – Part 2, IPv4 & DNS Configuration Messages. (Revision, reaffirmation, or withdrawal by 25 September 2020)

*BSR E1.37-7 - 201x, Additional Message Sets for ANSI E1.20 (RDM) - Gateway and Splitter Configuration

*E1.59 – 201x, Object Transform Protocol

Application Guide for ANSI E1.3 - 2001, Lighting Control Systems 0 to 10V Analog Control Specification

Recommended Practice for Ethernet Cabling Systems in Entertainment Lighting Applications

Supplement to the Recommended Practice for Ethernet Cabling in Entertainment Lighting Applications

Withdrawn standards

E1.45 - 2013 (W2015), Unidirectional Transport of IEEE 802 data frames over ANSI E1.11 (DMX512A)

E1.30-7 - 2009 (W2016), EPI 29, Allocation of Internet Protocol Version 4 Addresses to ACN Hosts

6.2 ANSI E1.27-2 – 2009 (R2014), Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products.

(Revision, reaffirmation, or withdrawal by 9 June 2019)

Mitch Hefter moved to reaffirm the standard. The motion was seconded. There was discussion, particularly about the use of unshielded twisted-pair Cat 5 cable versus shielded twisted-pair. It was noted that a study conducted many years ago by Gray Interfaces found no substantive differences between shielded and unshielded twisted-pair cable and EIA-485 cable for DMX512 applications. The study is available at https://tsp.esta.org/tsp/working_groups/CP/DMXoverCat5.html.

The motion shall be decided by letter ballot with a concurrent public review.

6.3 ANSI E1.30-3 – 2009 (R2014), EPI 25, Time Reference in ACN Systems Using SNTP and NTP.

(Revision, reaffirmation, or withdrawal by 9 June 2019)

Scott Blair moved to reaffirm the standard. The motion was seconded. There was no discussion. The motion shall be decided by letter ballot with a concurrent public review.

6.4 ANSI E1.30-10 – 2009 (R2014), EPI 32, Identification of Draft Device Description Language Modules.

(Revision, reaffirmation, or withdrawal by 9 June 2019)

Sam Kearney moved to reaffirm the standard. The motion was seconded. There was no discussion. The motion will be decided by letter ballot with a concurrent public review.

6.5 BSR E1.30-11, EPI 33, Transport of root PDUs over TCP

The TSC voted to accept this draft as an ANS, at their March meeting. The motion has been forwarded by letter ballot to the Executive Committee.

Scott Blair said he did not think there was action required. Karl Ruling reported that the Executive Committee ballot closes in three days; one person has not yet voted, and everyone else has voted "Yes."

6.6 BSR E1.33, Transport of ANSI E1.20 (RDM) in an E1.31 environment

See E1-33_Recirc_CPWG_BallotResultsCP_2019-1003r1.pdf. The working group must decide how to respond to the "No" vote received.

Scott Blair moved that the response shall be:

"The objections are unresolvable. No specific changes were requested. The standard is only as complicated as it needs to be. The working group tried to keep it simple. Other protocols do exist, and the voter is free to use them."

The motion was seconded and then approved by a unanimous show of hands, with no objections or abstentions.

6.7 BSR E1.37-7 - 20xx, Additional Message Sets for ANSI E1.20 (RDM) - Gateway and Splitter Configuration

See Final_E1-37-7_BallotResults_CP_2019-1004.pdf. The motion carried, and has been forwarded by letter ballot to the TSC.

Karl Ruling reported on the progress of the vote in the TSC. So far all the votes are "Yes," but not all the ballots have been returned.

6.8 BSR E1.59 - 201x, Object Transform Protocol

See BSRE1-59_PR1_Summary.pdf. No comments were received. Any updates or action?

Maya Nigrosh reported that the task group was disappointed by the lack of response. They do not believe that the draft document is perfect and want to get constructive feedback from affected parties. The task group wishes to offer it for public review again, and they will encourage their contacts to comment.

Dan Murfin moved to offer the draft standard for public review again. The motion was seconded. There was discussion. The motion carried by a unanimous show of hands with no objections and no abstentions.

Andrew Berry was appointed to the task group by Michael Lay.

6.9 Task group leader coordination

Scott Blair is the official scheduling liaison between the CPWG task groups and Frances Thompson. Anyone needing a physical task group meeting at an upcoming event should contact Scott.

*BSR E1.20 Scott Blair and Wayne Howell
BSR E1.30 No single leader; Generic group
BSR E1.31 Jason Potterf
BSR E1.30-11, EPI 33 Simon Newton
BSR E1.33 Scott Blair and Sam Kearney
BSR E1.37-2 Simon Newton
BSR E1.37-4 Peter Willis
BSR E1.37-5 Scott Blair and Simon Newton
BSR E1.37-6 Simon Newton
BSR E1.37-7 Scott Blair
BSR E1.59 Dan Murfin and Maya Nigrosh
E1.37-x Video Walls Scott Blair
E1.61 NAEP Jason Potterf and Kevin Loewen
IPv6 Task Group Jason Potterf
Next Gen Streaming Study Group Jason Potterf and Maya Nigrosh
Lighting Compliance Study Group Javid Butler and Wayne Howell
Plugfest Marketing Task Group Michael Lay
NAMM Education Task Group Milton Davis
Task Group Meeting Schedule Liaison Scott Blair*

7 New business

7.1 New project – DMX Interoperability

See TSP_Project_Request_DMX_interoperability.pdf. At their March 2019 meeting, the TSC voted to accept

the project, and has assigned it to the CPWG. The CPWG must vote on acceptance of the project. If it is accepted, then a task group must also be appointed by the working group chairpersons.

Mitch Hefter moved to accept the project. Bill Ellis seconded the motion.

There was discussion about the goal, which was described as being to offer guidance on testing for interoperability rather than testing for full compliance.

Scott Blair expressed concern that there is not full agreement among people about what exactly this document will cover. There was further discussion.

The motion was approved unanimously, with no objections and no abstentions.

Javid Butler and Wayne Howell were appointed as co-chairs. Michael Lay appointed the study group members to the task group, with the addition of Kevin Loewen, Eric Bloom, Paul Beasley, and Milton Davis.

7.2 NAMM education

Michael Lay reported that we have taken a curated approach before, but now are throwing open the door for proposals. Please submit ideas to Milton Davis or Michael Lay. This is how we can bring value to NAMM, and in return NAMM helps fund ESTA.

8 Other business and announcements

8.1 Above & Beyond Awards

Michael Lay noted that information on the Above & Beyond Awards may be found at http://tsp.esta.org/tsp/news/award_recipients.html. The nomination site is open year round, and the award is designed for members to highlight the work of their peers.

8.2 2019 TSP participation fee

Michael Lay urged people to pay their participation fee before they are cut off. He asked them not to force ESTA staff to chase them for their fee.

9 Schedule for future meetings

The full and current meeting schedule may be found at <http://www.esta.org/ESTA/meetings.php>.

9.1 Summer 2019 meetings (Westlake, TX)

Michael Lay noted that the CPWG will meet on Saturday, 20 July 2019, from 09:00 – 13:00 CDT at the Marriott Solana. There will be the PlugFest, too, said Sam Kearney.

9.2 Fall 2019 meetings (Westlake, TX)

Michael Lay noted that the Fall 2019 TSP meetings will be in Westlake, TX from 24 October thru 27 October 2019. The full meeting schedule has not yet been confirmed.

10 Adjournment

Michael Lay asked for any other actions. None were brought forth.

Having reached the end of the agenda, Michael Lay declared the meeting adjourned at 14:07. He thanked all for participating.

Control Protocols Working Group members as of 1 May 2019

Delegate	Company	Representing	Voting status	Int. Cat.
Cameron Affleck	English National Opera (ENO)	English National Opera (ENO)	O	U
Christian Allabauer	Christian Allabauer	Christian Allabauer	O	G
Matthew Ardine	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Tim Bachman	Altman Lighting	Altman Stage Lighting	O	MP
Nick Ballhorn-Wagner	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	O	MP
Robert Barbagallo	Solotech Inc.	Solotech Inc.	O	U
Paul Beasley	Walt Disney Imagineering	Walt Disney Company	P	U
Robert Bell	Acuity Brands Lighting	Acuity Brands Inc.	A	MP
Marcus Bengtsson	disguise	disguise	O	MP
Justin Bennett	University of the Incarnate Word	University of the Incarnate Word	O	U
Andrew Berry	X-Laser	X-Laser	P	MP
Scott M. Blair	Megapixel	Megapixel	P	CP
Eric Bloom	Westview Productions	Westview Productions	P	DR
Brent Boulnois	Candela Controls, Inc.	Candela Controls, Inc.	A	DE
Javid Butler	Integrated Theatre, Inc.	Integrated Theatre, Inc.	O	CP
Justyn Butler	JBOTS	JBOTS	O	CP
Ian Campbell	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Jean-Francois Canuel	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	O	CP
Steve Carlson	High Speed Design, Inc.	High Speed Design, Inc.	O	MP
Yongzhi Chen	Guangzhou Haoyang Electronic Co., Ltd.	Guangzhou Haoyang Electronic Co., Ltd.	O	CP
Anthony Chiappone	Chauvet Lighting	Chauvet Lighting	O	MP
Martin Chisnall	Martin Chisnall	Martin Chisnall	O	U
Jon Chuchla	Audio Visual Systems, Inc.	Audio Visual Systems, Inc.	O	G
Edward R. Condit	Edward R Condit	Edward R. Condit	O	G

Control Protocols Working Group members as of 1 May 2019

Delegate	Company	Representing	Voting status	Int. Cat.
Gareth Conner	Creative Conners, Inc.	Creative Conners, Inc.	O	MP
Fraser Connolly	Obsidian Controls	Obsidian Controls	O	DE
Chris Conti	PRG Lighting	PRG	O	DR
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Jeremy Day	Lumenpulse Lighting Inc.	Lumenpulse Lighting Inc.	O	MP
Larry Dew	W.A. Benjamin Electric Co.	W.A. Benjamin Electric Co.	O	DE
Rich Dionne	Dept. of Theatre	Purdue University	O	DE
Tucker Downs	Megapixel#	Megapixel	A	CP
Hamish Dumbreck	JESE Ltd.	James Embedded Systems Engineering	O	MP
James Eade	ABTT	ABTT	O	G
Bill Ellis	Candela Controls, Inc.	Candela Controls, Inc.	P	DE
Paul K. Ericson	Sparling	Stantec	O	DE
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	O	MP
Andrew Frazer	Stellascapes.com	Stellascapes.com	O	MP
Mike Garl	Mike Garl Consulting LLC	Mike Garl Consulting LLC	exf	
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
David Gooch	Chauvet Lighting	Chauvet Lighting	O	MP
Sean Goossen	LiteGear, Inc.	LiteGear, Inc.	O	MP
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	O	G
Erin Grabe	ESTA	ESTA	exf	G
Sean Harding	Port Lighting Systems	Port Lighting Systems	O	G
Nick Harper	Alphabet	Nick Harper	O	G
Robert Haycock	Cal Performances	UC Berkeley	I	U
Mitch Hefter	Mitch Hefter	USITT	P	U
Bill Hewlett	ImageCue LLC	ImageCue LLC	O	MP

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Delegate	Company	Representing	Voting status	Int. Cat.
Julian Hoare	Tait Towers	Tait Towers Manufacturing LLC	A	MP
Jon Hole	Zero 88	Eaton	P	MP
Jim Holladay	Luxence	Luxence	O	G
Maurits van der Hoorn	Pathway Connectivity	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Engineering Ltd.	Artistic Licence Holdings	P	DE
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Leroy "Tripp" Oliver, III	Mainstage Theatrical Supply, Inc.	Mainstage Theatrical Supply, Inc.	P	DR
Eric Johnson	Eric Johnson	Eric Johnson	O	G
Rob Johnston	Interactive Technologies, Inc.	Interactive Technologies, Inc.	O	MP
John Valus_Jr.	LEX Products	Lex TM3	P	CP
David Kane	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Michael Karlsson	LumenRadio AB	LumenRadio AB	O	MP
Sam Kearney	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Jonathan Kemble	High End Systems	Electronic Theatre Controls, Inc.	O	MP
Christopher Kennedy	ChamSys Ltd.	Chauvet Lighting	O	MP
Paul Kleissler	City Theatrical, Inc.	City Theatrical, Inc.	P	MP
Lucas Korytkowski	Rosstech	Insight Lighting	O	MP
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
Christian Krueger	Blizzard Lighting LLC	Blizzard Lighting LLC	P	MP
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	E3 Engineering & Education for Entertainment GmbH	P	U
Jason Kyle	JPK Systems Ltd.	JPK Systems Ltd.	O	MP
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	P	U
Michael Lay	Signify	Signify	P	MP
Hans Leiter	ETC GmbH	Electronic Theatre Controls, Inc.	O	MP

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Jon Lenard	Applied Electronics	Applied Electronics	O	MP
Kevin Loewen	Pathway Connectivity	Acuity Brands Inc.	P	MP
Jim Love	Tait Towers	Tait Towers Manufacturing LLC	P	MP
Rob Love	Rosstech	Insight Lighting	O	MP
David McCulloch	David McCulloch	David McCulloch	O	U
Bill McIntyre	Niscon Inc.	Show Distribution Group, Inc.	P	CP
John Mehlretter	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	MP
Daniel Murfin	Royal National Theatre	Royal National Theatre	P	U
John Musarra	John Musarra	John Musarra	O	U
Simon Newton	Open Lighting Project	Open Lighting Project	P	G
Maya Nigrosh	Sonos	Sonos	P	MP
Richard J. Nix	ESTA	ESTA	exf	G
Jim Ohrberg	Candela Controls, Inc.	Candela Controls, Inc.	A	DE
Mit Patel	disguise	disguise	O	MP
Jaxon Patterson	Insight Lighting	Insight Lighting	O	MP
Soren Sterdorff Peglau	Brother, Brother and Sons	Brother, Brother and Sons	O	MP
Jason Potterf	Cisco	Cisco	P	MP
Mark Primrose	Kino Flo, Inc.	Kino Flo, Inc.	P	CP
Gary Pritchard	LSC Lighting Systems (Aust) PTY Ltd	LSC Lighting Systems PTY Ltd	O	MP
Eric Rasmussen	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	MP
Charles Reese	Production Resource Group	Production Resource Group	O	DR
Alan M. Rowe	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Karl G. Ruling	ESTA	ESTA	exf	G
Yngve Sandboe	Sand Network Systems, Inc.	Sand Network Systems, Inc.	O	MP
Nicolai Gubi Schmidt	Nicolai Gubi Schmidt	Nicolai Gubi Schmidt	O	U

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Delegate	Company	Representing	Voting status	Int. Cat.
Larry Schoeneman	DesignLab Chicago, Inc.	DesignLab Chicago, Inc.	P	DR
Ford Sellers	Chauvet Lighting	Chauvet Lighting	O	MP
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Christopher B. Tilton	About the Stage, LLC	About the Stage, LLC	O	DE
Robert Timmerman	Philips Color Kinetics	Signify	O	MP
James Tomlinson	Team Tomlinson	Team Tomlinson	O	G
Tracy Underhill	Triple C Lighting & Controls	Triple C Lighting & Controls	O	G
Carlo Venturati	Clay Paky S.P.A.	Clay Paky S.P.A.	O	MP
Will Wagner	Carallon Ltd.	Carallon Ltd.	O	MP
Colin Waters	TMB	TMB	O	DR
Ralph Weber	ENDL Texas	ENDL Texas	O	G
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
Loren Wilton	Showman Systems	Showman Systems	O	CP
David Yellin	Sumolight GmbH	Sumolight GmbH	O	MP
Jeong Sik Yoo	Ghost LX	Ghost LX	O	DE

Voting Status key: P = Principal voter, A = Alternate voter, I = Individual voter; O=Observer; exf=ex officio, staff

Int. Cat. key: CP=Custom-market Producer; DE=Designer; DR=Dealer/Rental company; G=General interest; MP=Mass-market producer; U=User