

**Minutes**  
**Control Protocols Working Group**  
Friday, 26 January 2018  
Hilton Anaheim  
777 W Convention Way  
Anaheim, CA 92802

**Presiding chairs:**

Michael Lay; Philips Color Kinetics; Philips Lighting; P; MP  
Milton Davis; Doug Fleenor Design, Inc.; Doug Fleenor Design, Inc.; P; MP

**Recording secretaries:** Erin Grabe & Karl G. Ruling; ESTA

**Members attending:**

Christian Allabauer; O; G  
Matthew Ardine; IATSE Local 728; O; U  
Paul Beasley; Walt Disney Imagineering (The Walt Disney Company); P; U  
Scott M. Blair; Full Throttle Films/ VER; P; DR  
Eric Bloom; Westview Productions; P; DR  
Javid Butler; Integrated Theatre, Inc.; O; CP  
Edward R. Condit; OSRAM Lighting Solutions (OSRAM Licht AG); O; G  
Bill Ellis; Candela Controls, Inc.; P; DE  
Andrew Frazer; Stellascapes.com; P; MP  
Robert Goddard; Goddard Design Co.; P; MP  
Nick Harper; Alphabet (representing Nick Harper); I; G  
Mitch Hefter; USITT; P; U  
Julian Hoare; Tait Towers Manufacturing LLC; A; MP  
Wayne David Howell; Artistic Licence Engineering Ltd. (Artistic Licence Holdings); P; DE  
John Huntington; City Tech, Ent Tech Department (representing I.A.T.S.E. Local 1); A; U  
David Kane; I.A.T.S.E. Local 728; A; U  
Sam Kearney; Electronic Theatre Controls, Inc.; P; MP  
Paul Kleissler; City Theatrical, Inc.; P; MP  
Edwin S. Kramer; I.A.T.S.E. Local 1; P; U  
Roger Lattin; I.A.T.S.E. Local 728; P; U  
Dan Lisowski; Dept. Of Theatre and Dram (University of Wisconsin - Madison); P; DE  
Kevin Loewen; Pathway Connectivity (Acuity Brands Inc.); P; MP  
Daniel Murfin; Royal National Theatre; P; U  
Maya Nigrosh; Sonos; P; MP  
Mit Patel; disguise; P; MP  
Jason Potterf; Cisco; P; MP

**Visitors:**

Jordan Coleman; Disney

**1 Opening remarks**

Milton Davis called the meeting to order at 19:03. He welcomed all to Anaheim, and made a joke about the size of the NAMM show: "I'm sure you've seen the ENTIRE show in one day."

**2 Attendance**

**2.1 Introductions of those present and circulation of attendance sheet**

Self-introductions took place while a blue attendance sheet was circulated.

## 2.2 Introductions of those present via WebEx

Those on WebEx were asked to introduce themselves.

## 2.3 Determination of a quorum

The voters present were counted. Milton Davis announced that a supermajority was present.

## 2.4 Recognition of alternate voting members

Both Eddie Kramer and John Huntington were present for IATSE Local 1. They were reminded that only one could vote on a motion

## 3 Membership

### 3.1 Requirements for membership

The following statement was read aloud to the assembly by Milton Davis:

*Membership is open to all who are affected by the work of the group. People and companies that would be in any interest category other than a manufacturer interest category are, at this time, particularly encouraged to apply for membership. There is an annual \$100 participation fee for all members. Voting members are required to attend meetings and to vote on letter ballots. Voting members and their alternates may not miss three consecutive meetings without a loss of voting status.*

### 3.2 Changes to observer status due to lack of attendance

*For the THIRD meeting in a row, there are no voters in jeopardy of a change to Observer status due to lack of attendance!*

### 3.3 Processing of new membership requests and changes in membership status:

*The following applications and status change requests had been received:*

Marcus Bengtsson; disguise; A; MP  
Mit Patel; disguise; P; MP  
Sam Kearney; ETC; A to P (change in voting status)  
Nick Ballhorn-Wagner; ETC; O; MP  
Sarah Gascoine; PSAV; P; DR (Not present; accepted as observer)  
Garreth Conners; Creative Conners; O;  
Maya Nigrosh; Sonos; P; MP (change in representation and interest category)  
Nick Harper; Self; I;  
Eric Bloom; Westview Productions; P; DR  
David Kane; IATSE Local 728; A; U  
Gareth Conner; Creative Conners; O; MP

Mitch Hefter moved that we accept the applications and changes in status, with the exception of those applying for Principal status and not present, who shall be accepted as Observers. The motion was seconded and then approved with a mixture of raised hands and voice votes.

### 3.4 Consensus body

The full consensus body during this meeting, including those not present, was:

Delegate	Representation	Voting status	Int. cat.
Kevin Loewen	Acuity Brands Inc.	P	MP
Robert Bell	Acuity Brands Inc.	A	MP
Gary Douglas	Acuity Brands Inc.	A	MP
Maurits van der Hoorn	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Holdings	P	DE
Bill Ellis	Candela Controls, Inc.	P	DE

<b>Delegate</b>	<b>Representation</b>	<b>Voting status</b>	<b>Int. cat.</b>
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
Mit Patel	disguise	P	MP
Marcus Bengtsson	disguise	A	MP
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
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Eric Rasmussen	Electronic Theatre Controls, Inc.	A	MP
Scott M. Blair	Full Throttle Films/ VER	P	DR
Jeremy Hochman	Full Throttle Films/ VER	A	DR
Claude Ostin	Full Throttle Films/ VER	A	DR
Andrew Atienza	Full Throttle Films/ VER	A	DR
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
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
David Kane	I.A.T.S.E. Local 728	A	U
John Valus_Jr.	Lex TM3	P	CP
Michael Karlsson	LumenRadio AB	P	MP
Nick Harper	Nick Harper	I	G
Fraser Connolly	Obsidian Controls Ltd.	P	DE
Simon Newton	Open Lighting Project	P	G
Michael Lay	Philips Lighting	P	MP
Daniel Murfin	Royal National Theatre	P	U
Maya Nigrosh	Sonos	P	MP
Andrew Frazer	Stellascapes.com	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Julian Hoare	Tait Towers Manufacturing LLC	A	MP

Delegate	Representation	Voting status	Int. cat.
Dan Lisowski	University of Wisconsin - Madison	P	DE
Mitch Hefter	USITT	P	U
Paul Beasley	Walt Disney Company	P	U
Eric Bloom	Westview Productions	P	DR
<b>Total votes possible</b>		<b>30</b>	
<b>Votes by interest category</b>		2	CP
		4	DE
		3	DR
		2	G
		13	MP
		6	U

#### 4 Approval of the minutes from the previous meeting

See *CPmin11-2017.pdf*

Mitch Hefter moved that the draft minutes be approved as written. The motion was seconded. It was approved unanimously with a show of hands.

#### 5 Reading of the call for patents

The following statement was read aloud to the assembly by Milton Davis:

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 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.

Michael Lay mentioned a patent issued recently, 9871616, which provides error detection and recovery in a DMX512 network. The consensus was that the patent has no bearing on our current work.

#### 6 Reading of the anti-trust statement

The following statement was read aloud to the assembly by Milton Davis:

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 a ESTA meeting, please bring your concern to ESTA management. An easy to read pamphlet describing the antitrust laws is available from the ESTA staff.

Copies of the easy-to-read pamphlet were displayed to show their availability. No anti-trust issues were reported to the assembly.

## 7 Approval of agenda

Scott Blair moved to approve the agenda as drafted. The motion was seconded and approved by a show of hands.

## 8 Old business

### 8.1 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.*

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 (R2013), Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories. (Revision, reaffirmation, or withdrawal by 13 March 2018)

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, 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)

\* ANSI E1.31 - 2016, Lightweight streaming protocol for transport of DMX512 using ACN (Revision, reaffirmation, or withdrawal by 11 October 2021)

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)

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

**8.2 BSR E1.20 - 201x, Remote Device Management over USITT DMX512**

*Any news or action on a revised draft for consideration? The PINS for revision was filed 2 November 2015.*

Wayne Howell reported on two days of constructive task group meetings, with the document making good progress. They are planning to get a document into public review in time to have the comments back before the working group meeting, July 21, in Texas.

ESTA staff advised that the draft revised standard will need to be ready soon to be voted on for public review at the March meetings. If that deadline is missed, a special working group meeting would need to be called to approve the public review. The first public review of a revision requires the approval of the TSC.

**8.3 BSR E1.31 – 20xx, Entertainment Technology—Lightweight streaming protocol for transport of DMX512 using ACN** (revise, reaffirm, or withdrawal by 11 October 2021)

*A working group letter ballot to accept this standard as an American National Standard was issued to the working group. The ballot period is 14 December 2017 through 15 January 2018. Recirculated through 30 January 2018.*

Maya Nigrosh spoke in support of the objections received during the current ballot, specifically eliminating the the requirement to support IPv4 for receivers. Relaxing the wording to make IPv4 options, would allow manufacturers to make IPv6 only products, which she sees as the IP scheme that will dominate in the future.

Karl Ruling explained what the next steps would be on the ballot, which is in recirculation because of the No votes, including potentially reporting unresolved objectors to ANSI.

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

*See E1.33\_CP2010-1032r5.pdf and E1-33\_DRAFT5thRevwCommntResols.pdf.*

*The PINS form to announce this project was filed on 31 July 2006. It has been through five public reviews, but never been published.*

Scott Blair moved to approve the draft comment resolutions. The motion was seconded. The motion carried with the required supermajority by a show of hands and voice votes.

Scott Blair moved to approve the revised draft standard document for public review, its sixth. The motion was seconded. The motion carried with a show of hands and voice votes.

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

*From the draft October 2016 minutes:*

*There was some discussion on whether or not there was a problem in waiting to publish this so long after its last public review. Karl Ruling advised that it would need to be offered for another public review before it is submitted for final ANSI approval. The consensus was to offer it for public review with BSR E1.33.*

Scott Blair moved to offer the document for public review. (There were no comments in the previous public review.) The motion carried by a show of hands.

## **8.6 BSR E1.37-4, Firmware updates via ANSI E1.20, RDM**

See *BSR\_E1-37-4\_doc2017-1024.pdf*.

Sam Kearney made a motion to offer the draft standard for public review, its first. The motion was seconded and then approved with a combination of a show of hands and voice votes.

## **8.7 BSR E1.37-5, General Purpose Messages for ANSI E1.20 RDM**

See *E1.37-5 2nd PR comment resolutions 2018-01-01.pdf* and *E1-37-5 General Purpose PIDs 2018-01-01.pdf*, distributed to the group on 5 January 2018.

Scott Blair reported that some of the previously decided on changes don't fit with the newer functions. Originally, Parameters Description Messages that exist here were to be moved to other 37-x projects. But, there were not a lot of comments, so the PDM were left in, and, if they were taken out, there would not be much left in this document.

There was considerable discussion over whether to keep the 37-x suite together or incorporated in E1.20. The task group noted that more work is needed on the resolutions and documents before action can be taken. The task group will continue to tinker with the suite.

## **8.8 BSR E1.37-6 - 20xx, Additional Message Sets for ANSI E1.20 (RDM) - Parameter Description Messages**

No action.

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

See *E1-37-7\_DraftResolsToFrstRevwCmmnts.pdf* and *E1-37-7\_Gateway PIDs\_CP2016-1026r1.pdf*.

Scott Blair moved that the comment resolutions be accepted. The motion was seconded, and then approved by a supermajority with a combination of a show of hands and voice votes.

Scott Blair moved that the revised draft standard be offered for public review. The motion was seconded. The motions was approved with a combination of a show of hands and voice votes.

## **8.10 BSR E1.59 - 201x, Automation Vector Transmission Protocol**

Dan Lisowski reported that the task group has developed a good framework, but more work is needed. He said he had no idea when the CPWG will see a document for public review.

## **8.11 IPv6 task group report**

*Documents in order of priority for IPv6 consideration:*

- E1-31 - 2016 -Entertainment Technology –Lightweight streaming protocol for transport of DMX512 using ACN (open for revision as of January 2017)
- E1.37-2 - 2015 Entertainment Technology –Additional Message Sets for ANSI E1.20 (RDM) –Part 2, IPv4 & DNS Configuration Messages
- E1.17 - 2015 -Entertainment Technology -Architecture for Control Networks (ACN)  
Elements of E1.17 depended on by E1.31 must be addressed as a high priority

*From the draft November 2017 minutes:*

*Jason Potterf reported that E1.31 and E1.33 have IPv6 added, but that no one has expressed much interest in tackling E1.17. He thinks that E1.37-2 would be a quick add, but it is not critical at this time. There was some discussion about static addressing in IPv6, which Jason says is nearly impossible. Michael Lay said that he and Milton Davis will appoint a road map committee to layout time-lines for our projects, including a replacement for E1.31.*

Jason Potterf reported that no further changes are planned at this time.

## 8.12 Compliance testing study group

*From the draft November minutes:*

*Javid Butler recommended we form a task group to research the commercial market to see if there is a market argument for this testing. Michael Lay appointed Javid Butler and Wayne Howell as co-chairs of this research group, and added Mitch Hefter. Peter Willis, Steve Carlson, Jason Potterf, Bob Goddard, Bill Ellis, Ulrich Kunkel, and Scott Blair to it.*

Wayne Howell said that the study group meeting was very constructive and there is enthusiasm to move this forward. Javid Butler and Wayne Howell said that they had received a lot of feedback on which direction to move this project,. They recommended that at this time it remain a study group.

The study group requested an email reflector.

## 8.13 Lighting Protocols Plugfest

*The event will take place 25-27 April 2018, at a new venue, still near Gatwick Airport. Any news?*

Wayne Howell reported that the event will be at the Copthorne Hotel, a new venue near old venue, but a nicer place. They are rebranding the plugfest so it covers a wider range of control protocols scope, DALI and other lighting control standards.

The website to book the event goes live Tuesday 30 January. <http://www.plasa.org/technical/plugfest18.asp>.

## 8.14 Texas Plugfest

Scott Blair said that topics and leaders for round-tables are needed. They are looking to have a longer cycle, due to the number of public reviews. Task group meetings are planned to start on Thursday 19 July and end on Tuesday 24 July. The Plugfest will run Friday-Monday, times TBD, dependent on Eric Johnson's schedule.

Mike Lay said he would get the task group together to plan this. Bob Goddard asked for a DMX roundtable.

## 8.15 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 Simon Newton  
BSR E1.37-6 Simon Newton  
BSR E1.37-7 Scott Blair  
BSR E1.59 Dan Lisowski and Maya Nigrosh  
E1.37-x Video Walls Scott Blair  
E1.6XX NAEP  
IPv6 Task Group Jason Potterf  
Plugfest Marketing Task Group Michael Lay  
Task Group Liaison Scott Blair*

Scott Blair reported that they are planning to have meetings from Thursday evening through Tuesday afternoon, July 19 through 24. Sam Kearney is replacing Dan Antonuk on the task groups.

## 9 New business



### **9.1 Network Advertisement of Entertainment Protocols (NAEP)**

*See NAEP\_TSP\_ProjectRequest\_Update.pdf. Jason Potterf and Kevin Loewen, co-chairs of the potential draft standard to report.*

Kevin Loewen moved that the project be approved. The motion was seconded and accepted with a show of hands.

Jason Potterf said that the task group would develop a scope and requirements in tomorrow's meeting, An email reflector would be useful for document circulation.

### **9.2 ANSI E1.11 – 2008 (R2013), Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories (Revision, reaffirmation, or withdrawal by 13 March 2018)**

Mitch Hefter moved that we reaffirm this standard. The motion was seconded. A letter ballot and concurrent public review will be held.

### **9.3 Standards permalinks**

Wayne Howell addressed the group. He posited that “permalinks” could be used in standards to reference other standards by a number that never changes. This would be a simple spreadsheet, says Wayne, that would be used as an internal guide for our own references. The purpose would be to help us see what the knock-on effects are when we change a clause.

These would not be “permalinks” as usually understood with Internet URLs, but simply a notation for our purposes indicating what references what in another of our documents.

There was further discussion about the need for such a table or document.

## **10 Other business & announcements**

### **10.1 Above & Beyond Awards**

*The Above and Beyond Award nomination form, as well as a list of past recipients, is available at <http://estalink.us/aboveandbeyond>.*

Milton Davis announced that we have an Above and Beyond Award winner in our midst: Scott Blair. He presented the award and noted that Scott has devoted countless, tireless hours to this group.

### **10.2 ESTA DMX512/RDM Educational Kit - “Train the Trainer” Session**

Bill Ellis explained the purpose of the kit to the new members of the CPWG who did not know. John Huntington reported that he had received it, used to help teach his students, and shipped the kit back.

### **10.3 USITT sessions**

Mitch Hefter said that program proposals for USITT 2019 are due by the time of the USITT 2018 Conference. The 2019 Conference will be in Louisville, Kentucky.

## **11 Future meetings**

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

### **11.1 March meetings**

The March 2018 meetings will be held in conjunction with USITT 2018 in Fort Lauderdale, FL. The CPWG meeting is scheduled for Thursday, 15 March 2018, from 9:00 to 13:00 EDT. (Daylight Saving Time starts March 11 in the United States.)

### **11.2 July meetings**

The July 2018 meetings are scheduled to be held 19-24 July 2018 at the D/FW Marriott Solana in Westlake, TX.

The CPWG meeting is scheduled for 21 July from 09:00 to 13:00.

**12 Adjournment**

Scott Blair moved the meeting adjourn. The motion was seconded. Milton Davis declared the meeting adjourned at 21:33 PST. Milton Davis thanked the people present and online.

Delegate	Company	Representation	Voting status	Int. cat.
Christian Allabauer	Christian Allabauer	Christian Allabauer	O	G
Matthew Ardine	IATSE Local 728	IATSE Local 728	O	U
Andrew Atienza	Full Throttle Films/ VER	Full Throttle Films/ VER	A	DR
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	A	MP
Scott M. Blair	Full Throttle Films/ VER	Full Throttle Films/ VER	P	DR
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
Anthony Chiappone	Chauvet Lighting	Chauvet Lighting	O	MP
Jon Chuchla	Audio Visual Systems, Inc.	Audio Visual Systems, Inc.	O	G
Edward R. Condit	OSRAM Lighting Solutions	OSRAM Licht AG	O	G
Gareth Conner	Creative Conners, Inc.	Creative Conners, Inc.	O	MP
Fraser Connolly	Obsidian Controls Ltd.	Obsidian Controls Ltd.	P	DE
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
Gary Douglas	Pathway Connectivity	Acuity Brands Inc.	A	MP
Tucker Downs	Tucker Downs	Tucker Downs	O	U
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	P	MP

Delegate	Company	Representation	Voting status	Int. cat.
Sarah Gascoine	PSAV Presentation Services	PSAV Presentation Services	O	DR
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
George Gong	Philips Lighting	Philips Lighting	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	I	G
Mitch Hefter	Mitch Hefter	USITT	P	U
Bill Hewlett	ImageCue LLC	ImageCue LLC	O	MP
Julian Hoare	Tait Towers	Tait Towers Manufacturing LLC	A	MP
Jeremy Hochman	Full Throttle Films/ VER	Full Throttle Films/ VER	A	DR
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
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	P	MP
Sam Kearney	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Jonathan Kemble	High End Systems	ETC	O	MP
Paul Kleissler	City Theatrical, Inc.	City Theatrical, Inc.	P	MP
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
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	Philips Color Kinetics	Philips Lighting	P	MP
Hans Leiter	ETC GmbH	Electronic Theatre Controls, Inc.	O	MP
Jon Lenard	Applied Electronics	Applied Electronics	O	MP
Dan Lisowski	Dept. Of Theatre and Drama	University of Wisconsin - Madison	P	DE

Delegate	Company	Representation	Voting status	Int. cat.
Kevin Loewen	Pathway Connectivity	Acuity Brands Inc.	P	MP
Jim Love	Tait Towers	Tait Towers Manufacturing LLC	P	MP
Royal Marty	ZFX, Inc.	ZFX, Inc.	O	MP
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
Jim Ohrberg	Candela Controls, Inc.	Candela Controls, Inc.	A	DE
Danilo Oliveira	Chauvet Lighting	Chauvet Lighting	O	MP
Claude Ostyn	Full Throttle Films/ VER	Full Throttle Films/ VER	A	DR
Mit Patel	disguise	disguise	P	MP
Jason Potterf	Cisco	Cisco	P	MP
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	Gobo & Highlight A/S	Gobo & Highlight A/S	O	DR
Larry Schoeneman	DesignLab Chicago, Inc.	DesignLab Chicago, Inc.	P	DR
Ford Sellers	Chauvet Lighting	Chauvet Lighting	O	MP
Sean Sill	Sean Sill	Sean Sill	O	CP
Ralph Stillinger	Strand Lighting	Philips 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	Philips Lighting	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

Delegate	Company	Representation	Voting status	Int. cat.
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 member, exf = Ex Officio member (staff)

**Interest Category Key:** CP = Custom-market producer, DE = Designer, DR = Dealer or rental company, G = General interest, MP = Mass-market producer, U = User