

Minutes
Control Protocols Working Group
Friday, 25 January 2019
California Room, Wyndham Garden Anaheim
Anaheim, CA

Chairpersons:

Milton Davis; Doug Fleenor Design, Inc; P; MP (presiding)
Michael Lay; Signify; P; MP

Recording secretaries:

Karl Ruling and Richard Nix, ESTA

Attendees:

Tim Bachman; Altman Stage Lighting; O; MP
Paul Beasley; Walt Disney Company; P; U
Scott M. Blair; Megapixel; P; CP
Eric Bloom; Westview Productions; P; DR
Javid Butler; Integrated Theatre, Inc.; O; CP
Ian Campbell; Doug Fleenor Design, Inc.; A; MP
Anthony Chiappone; Chauvet Lighting; O; MP
Edward R. Condit; Edward R. Condit; O; G
Paul K. Ericson; Stantec; O; DE
Robert Goddard; Goddard Design Co.; P; MP
David Gooch; Chauvet Lighting; O; MP
Julian Hoare; Tait Towers Manufacturing LLC; A; MP
Jon Hole; Eaton; P; MP
Wayne David Howell; Artistic Licence Holdings; P; DE
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
Edwin S. Kramer; I.A.T.S.E. Local 1; P; U
Christian Krueger; Blizzard Lighting LLC; P; MP
Ulrich Kunkel; E3 Engineering & Education for Entertainment GmbH; P; U
Roger Lattin; I.A.T.S.E. Local 728; P; U
Kevin Loewen; Acuity Brands Inc.; P; MP
Jim Love; Tait Towers Manufacturing LLC; P; MP
Bill McIntyre; Show Distribution Group, Inc.; P; CP
Daniel Murfin; Royal National Theatre; P; U
Maya Nigrosh; Sonos; P; MP
Jason Potterf; Cisco; P; MP
Mark Primrose; Kino Flo, Inc.; P; CP
Peter Willis; Howard Eaton Lighting Ltd.; P; CP

Visitors:

1 Opening Remarks

Milton Davis called the meeting to order at 8:05 a.m., welcoming everyone to the meeting. He reminded everyone to please silence their cell phones during the meeting.

2 Anti-trust and patent statements

2.1 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 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 said that he had a PDF file of the guide, available to anyone upon request. No antitrust issues were revealed.

2.2 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 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 Milton Davis:

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 (present in-person, and via WebEx)

Everyone introduced themselves

3.3 Determination of a quorum

[There are currently 30 votes possible. A quorum is 10; a supermajority is 16.]

A show of hands in the room and a count of online voting members revealed a supermajority was present.

3.4 Processing of new membership and status change requests

As of 05 January 2019, the following applications and status change requests have been received:

Ed Condit; Ed Condit; O; G (status change request)
Leroy "Tripp" Oliver, III; Mainstage Theatrical Supply, Inc.; P; DE (new application)
Chen Yongzhi; Guangzhou Haoyang Electronic Co., Ltd; O; CP (new application)
Christian Krueger, Blizzard Lighting LLC; P; MP (new application)
Nick Harper; Nick Harper; (status change request from I to O)
Tim Bachman; Altman Lighting; MP; Observer (applied on the spot)

Scott Blair moved to approve the applications. The motion was seconded. The motion carried without discussion or objection.

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:

Ulrich Kunkel; E3. Present; no change in status

John Valus, Jr.; Lex TM3. Present; no change in status

Paul Beasley; Walt Disney Company. Present; no change in status.

3.5.2 Changes due to missed letter ballots

There are none.

3.6 Consensus body

The full consensus voting body as of 25 January 2019, after all changes occurring at this meeting, was:

Name	Representing	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
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

Name	Representing	Status	Int Cat
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
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
Andrew Frazer	Stellascapes.com	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:			31
Votes by interest category	Custom-market producer	CP	5
	Designer	DE	3
	Dealer or rental company	DR	2
	General interest	G	1
	Mass-market producer	MP	13
	User	U	7
Voting status key: P = Principal voter, A = Alternate voter, I = Individual voter, O = Observer member			

4 Approval of the minutes from the last meeting

See *CPmin10-2018_DRAFT.pdf*

A motion to approve minutes was made by Scott Blair. The motion was seconded and carried.

5 Approval of agenda

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

Bob Goddard requested that agenda item 6.13, compliance testing study group report, be moved to the top of the agenda at 6.1. Michael Lay requested time at item 8.5 to read an update email from Mitch Hefter.

Kevin Leowen moved to approve the amended agenda. The motion was seconded and carried.

6 Old Business

6.1 Compliance testing study group

(Bob Goddard had requested this agenda item be moved to the top of 6.)

Wayne Howell reported that they had been meeting regularly and now are seeing a way forward. They realize their original scope was too large, so they are narrowing it to inventing possible compliance testing scripts. They are on the verge of writing some documents that others can see.

Jason Potterf reported that originally this was focused on DMX512, but it is clear that some RDM functionality testing will be needed.

6.2 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 (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)

* 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

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

See E1-20_PubRevwSummary_18Dec2018.pdf. The public review ended on 18 December 2018, and a summary was sent to the CPWG on that day.

Wayne Howell gave an update, the task group has completed draft resolutions to about 1/3 of the 150 or so comments received during last PR. The core task group people will not be at USITT, so will meet via WebEx, with the Texas meetings being the next face-to-face meeting opportunity. He said a possible revised public review document might be ready then, but he did not promise that.

Discussion followed about breaking these apart into separate standards.

Peter Willis suggested the document be restructured so that it covers only the main functions, with PIDs in a separate document. Wayne Howell said that the E1.20 task group does not have the bandwidth for this, and would like to proceed with the existing standard. The consensus of the group was to leave the documents as currently structured.

There was discussion of a possible white paper with an index of what functionality can be found in what PIDs in what standards.

6.4 ANSI E1.31 – 2018, Entertainment Technology—Lightweight streaming protocol for transport of DMX512 using ACN

No news or action. This will be removed from this part of future agendas.

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

See Proposed_BSR_E1-33_Resolutions_by_Comment#.pdf. The seventh public review ended, a summary of the comments was distributed, and the proposed resolutions to those comments are before you now for consideration.

Scott Blair gave a summary of the document's long history (77 numbered drafts, 7 public reviews, 797 public review comments over 12.5 years), and urged people to move it forward. Sam Kearney concurred.

Scott Blair moved to accept the comment resolutions. The motion was seconded. There was no discussion. The motion carried unanimously, which was a supermajority.

Scott Blair then moved to accept the draft E1.33 as an American National Standard. The motion was seconded. The question will be decided by letter ballot.

Karl Ruling gave an overview of the letter ballot process.

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

From the October minutes:

Scott Blair gave a report. By discussion, the group agreed to move this forward at the January meeting.

Scott Blair then moved to accept the draft E1.30-11 as an American National Standard. The motion was seconded. The question will be decided by letter ballot. [The last review netted no comments needing resolution.]

6.7 BSR E1.37-4, Firmware updates via ANSI E1.20, RDM

From the October minutes:

Sam Kearney and Scott Blair reported that some work had been done on public review comment resolutions, but the work is not complete. Peter Willis is still working on the last few Public Review draft resolutions.

Any updates or action?

Peter Willis gave an update on progress, saying that the previous day's task group was very productive. He discussed some of the technical aspects, such as "state machine" states, and a flow diagram. He anticipates draft resolutions by July meeting, next PR probably not until after July meeting

6.8 BSR E1.37-5, General Purpose Messages for ANSI E1.20 RDM

See BSRE1-37-5-201x_PR3_CmmntSmmry.pdf. The third public review ended on 25 December 2018 and the comment summary has been distributed to the working group.

Scott Blair gave an update on resolution of comments. They made good progress at the previous day's TG meeting, and he expects to have resolutions and a revised document ready by July meeting.

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

From the October minutes:

Scott Blair said that these messages are now in E1.37-5, so E1.37-6 is redundant at this time.

Scott Blair gave an informative update. There was no action at this time.

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

See PROPOSED_BSR_E1-37-7_Resolutions_by_Comment #.pdf

Scott Blair gave an update. He moved to accept the comment resolutions as submitted to the WG, which was seconded and carried, with one objection from Peter Willis, and one abstention from Bob Goddard.

Scott Blair then moved to accept the draft E1.37-7 as an American National Standard. The motion was seconded. The question will be decided by letter ballot.

Peter Willis explained why he voted 'No' on the resolutions. He said that the PIDS offered in the draft standard did not provide the functions that he needs for his applications, but the task group does not agree with him. However, he does not intend to hold up the document.

6.11 BSR E1.59 - 201x, Automation Vector Transmission Protocol

See E1.59 - Working Document.pdf. The latest working draft was distributed a few weeks ago for your review. Is it time to take additional action?

Maya Nigrosh gave an update. Dan Murfin moved to send the draft to first public review. The motion was seconded, and carried by the required Simplemajority. The motion passes to the TSC for consideration.

6.12 BSR E1.61 – 20xx, NAEP

From the October minutes:

Jason Potterf reported that he is working on not reinventing the wheel. He expects a first draft in time for the

January meeting.

Jason reported that there had been little progress on this project due to task group members working on other draft standards. He expects further progress soon, including the generation of a set of PIDs for IPv6 management.

6.13 IPv6 task group report

Jason Potterf reported that not much has changed on the IPv6 front. However we will need the IPv6 config PIDs to go into some documents in the relative near future.

6.14 Next Gen Streaming Study Group

Jason reported that the Nexgen TG meeting was happening after lunch today. There has been good progress in defining the criteria that needs to be addressed in this new standard. He expects a press release to be distributed soon, in the form of a survey, which he hopes can stay 'live' until responses stop arriving.

6.15 Plugfests

6.15.1 Plugfest – Europe

Wayne Howell reported that this will be happening in Northern France from 26-28 February. And there are currently around 15 participants committed. It's now being called the *European Plugfest*, with the idea of cycling through various European countries.

Peter Willis said about half of the participants currently booked were previous attendees, but new registrants are being picked up from companies that did not want to go to the UK.

6.15.2 Plugfest – USA

Scott Blair reported this will occur as usual at the Marriott Solana in Westlake, TX. Round Table topics have not yet been decided, and he hopes to see some implementations of E1.33.

Michael Lay said that the initial press release was sent already, and a larger press release will be sent soon after NAMM. The plugfest site has been updated, please go look at it!

Sam Kearney reminded everyone that loaner brokers, etc are available for testing purposes.

Jason Potterf said that with E1.33 a lot can be done virtually, on-line.

6.16 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*

Scott Blair reported that there is not much in process now that is not headed out to approval or public review. It's possible there may be few or no task group meetings required in July. Further discussion revealed that a CPWG meeting may not be needed in the March cycle.

7 New business

None.

8 Other business and announcements

8.1 Above & Beyond Awards

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.

Sam Kearney was presented an award by Jason Potterf, who had nominated Sam for his productive work on many task groups.

8.2 2019 TSP participation fee

Richard Nix reminded people, if they have not yet paid the annual TSP participation fee, to please login to their account at esta.org, by clicking "Login" at the top-right corner of the ESTA home page, or by clicking the payment link included in the TSP participation fee email notification.

Michael Lay asked everyone to please pay the participation fee as soon as possible.

8.3 ESTA DMX512/RDM Educational Kit - "Train the Trainer" Session

John Huntington said that he has used the kit at his school, and it was useful.

8.4 Innova

Milton Davis described what this program entails, and described a few of the topics that have been produced. John Huntington said he had submitted a three-part networking presentation, which is still under review. The review process is lengthy, he said.

8.5 IES Control updates

Michael Lay read Mitch Hefter's email update:

The IES has proposed merging the Energy Management Sub-Committee on Controls with the Control Protocols Committee into one Controls Committee. This will simplify the development process by removing one layer of approval process in document development and better alignment/less duplication of efforts. I (Mitch Hefter) am expected to be named as one of the Co-Vice-Chairs, and of course, will work on any liaison with the CPWG.

I also lead the Task Group developing a Recommended Practice for Dimming and Control Method Designations. Committee ballot is expected for first public review is expected in the first quarter of 2019.

The draft scope currently reads:

"This Recommended Practice provides simple standard designations for open non-proprietary dimming and control methods and protocols. Inclusion of dimming and control method designations in design and construction documents – especially luminaire schedules – provides clarity in selection of compatible dimming and control equipment. Manufacturers of luminaires, drivers, controllers, and lamps are encouraged to use these same designations to clearly identify dimming methods that are compatible with their products in data sheets."

8.6 Upcoming standards actions

Michael Lay reminded everyone that three current standards (E1.27-2, E1.30-3, and E1.30-10) will arrive on the next meeting agenda as documents requiring action. The meeting will occur via WebEx, between now and July (see item 9.1 below)

9 Schedule for future meetings

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

9.1 Spring 2019 meetings (USITT)

The Spring 2019 meetings will be held in Louisville, KY, in conjunction with the USITT conference and Stage Expo. The CPWG is currently scheduled to meet from 9:00 – 13:00 Eastern time, on 21 March 2019, at the Hyatt Regency Louisville.

Milton Davis advised everyone that the CPWG will not meet in March, but that everyone should expect to participate in a Webex meeting, anticipated after USITT

9.2 Summer 2019 meetings (Westlake, TX)

Michael Lay pointed out the note in the agenda that the Summer 2019 meetings will return to the D/FW Marriott Solana, in Westlake, Texas, 18-22 July. The full meeting schedule has not yet been confirmed.

10 Adjournment

Scott Blair moved to adjourn. The agenda being complete, and no further business being brought before the group, Milton Davis declared the meeting adjourned at 9:55a.m.

Control Protocols Working Group members as of 27 January 2019

Name	Representing	Status	Int Cat
Christian Allabauer	Christian Allabauer	O	G
Matthew Ardine	I.A.T.S.E. Local 728	A	U
Nick Ballhorn-Wagner	Electronic Theatre Controls, Inc.	O	MP
Robert Barbagallo	Solotech Inc.	O	U
Paul Beasley	Walt Disney Company	P	U
Robert Bell	Acuity Brands Inc.	A	MP
Marcus Bengtsson	disguise	O	MP
Andrew Berry	X-Laser	P	MP
Scott M. Blair	Megapixel	P	CP
Eric Bloom	Westview Productions	P	DR
Brent Boulnois	Candela Controls, Inc.	A	DE
Javid Butler	Integrated Theatre, Inc.	O	CP
Justyn Butler	JBOTS	O	CP
Ian Campbell	Doug Fleenor Design, Inc.	A	MP
Jean-Francois Canuel	A.C. Lighting Ltd.	O	CP
Steve Carlson	High Speed Design, Inc.	O	MP
Anthony Chiappone	Chauvet Lighting	O	MP
Martin Chisnall	Martin Chisnall	O	U
Jon Chuchla	Audio Visual Systems, Inc.	O	G
Edward R. Condit	OSRAM Licht AG	O	G
Gareth Conner	Creative Conners, Inc.	O	MP
Fraser Connolly	Obsidian Controls	O	DE
Milton Davis	Doug Fleenor Design, Inc.	P	MP
Jeremy Day	Lumenpulse Lighting Inc.	O	MP
Larry Dew	W.A. Benjamin Electric Co.	O	DE
Rich Dionne	Purdue University	O	DE
Hamish Dumbreck	James Embedded Systems Engineering	O	MP
James Eade	ABTT	O	G
Bill Ellis	Candela Controls, Inc.	P	DE
Paul K. Ericson	Stantec	O	DE

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Trevor Forrest	Helvar Lighting Control	O	MP
Andrew Frazer	Stellascapes.com	P	MP
Robert Goddard	Goddard Design Co.	P	MP
George Gong	Signify	O	MP
David Gooch	Chauvet Lighting	O	MP
Jerry Gorrell	Theatre Safety Programs	O	G
Sean Harding	Port Lighting Systems	O	G
Nick Harper	Nick Harper	I	G
Robert Haycock	UC Berkeley	I	U
Mitch Hefter	USITT	P	U
Bill Hewlett	ImageCue LLC	O	MP
Julian Hoare	Tait Towers Manufacturing LLC	A	MP
Jon Hole	Eaton	P	MP
Jim Holladay	Luxence	O	G
Maurits van der Hoorn	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Holdings	P	DE
John Huntington	I.A.T.S.E. Local 1	A	U
Eric Johnson	Eric Johnson	O	G
Rob Johnston	Interactive Technologies, Inc.	O	MP
John Valus_Jr.	Lex TM3	P	CP
David Kane	I.A.T.S.E. Local 728	A	U
Michael Karlsson	LumenRadio AB	O	MP
Sam Kearney	Electronic Theatre Controls, Inc.	P	MP
Jonathan Kemble	ETC	O	MP
Christopher Kennedy	Chauvet Lighting	O	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
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	P	U
Jason Kyle	JPK Systems Ltd.	O	MP

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Roger Lattin	I.A.T.S.E. Local 728	P	U
Michael Lay	Signify	P	MP
Hans Leiter	Electronic Theatre Controls, Inc.	O	MP
Jon Lenard	Applied Electronics	O	MP
Dan Lisowski	University of Wisconsin - Madison	O	DE
Kevin Loewen	Acuity Brands Inc.	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Rob Love	Insight Lighting	O	MP
Bill McIntyre	Show Distribution Group, Inc.	P	CP
John Mehlretter	Lehigh Electric Products Co.	O	MP
Daniel Murfin	Royal National Theatre	P	U
John Musarra	John Musarra	O	U
Simon Newton	Open Lighting Project	P	G
Maya Nigrosh	Sonos	P	MP
Jim Ohrberg	Candela Controls, Inc.	A	DE
Mit Patel	disguise	O	MP
Jaxon Patterson	Insight Lighting	O	MP
Soren Sterdorff Peglau	Brother, Brother and Sons	O	MP
Jason Potterf	Cisco	P	MP
Mark Primrose	Kino Flo, Inc.	P	CP
Gary Pritchard	LSC Lighting Systems PTY Ltd	O	MP
Eric Rasmussen	Electronic Theatre Controls, Inc.	A	MP
Charles Reese	Production Resource Group	O	DR
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
Yngve Sandboe	Sand Network Systems, Inc.	O	MP
Nicolai Gubi Schmidt	Nicolai Gubi Schmidt	O	U
Larry Schoeneman	DesignLab Chicago, Inc.	P	DR
Ford Sellers	Chauvet Lighting	O	MP
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Christopher B. Tilton	About the Stage, LLC	O	DE

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Name	Representing	Status	Int Cat
Robert Timmerman	Signify	O	MP
James Tomlinson	Team Tomlinson	O	G
Tracy Underhill	Triple C Lighting & Controls	O	G
Carlo Venturati	Clay Paky S.P.A.	O	MP
Will Wagner	Carallon Ltd.	O	MP
Colin Waters	TMB	O	DR
Ralph Weber	ENDL Texas	O	G
Peter Willis	Howard Eaton Lighting Ltd.	P	CP
Loren Wilton	Showman Systems	O	CP
David Yellin	Sumolight GmbH	O	MP
Jeong Sik Yoo	Ghost LX	O	DE