

Minutes
Control Protocols Working Group
Saturday, 20 July 2019
Westlake, TX

Chairpersons:

Michael Lay; Signify; P; MP
Milton Davis; Doug Fleenor Design; P; MP (Presiding)

Recording secretaries: Karl Ruling and Richard Nix (ESTA)

Attendees:

Paul Beasley; Walt Disney Company; P; U
Justin Bennett; University of the Incarnate Word; O; U
Scott M. Blair; Megapixel; P; CP
John David (Javid) Butler; HDR Consulting, LLC; P; DE
Edward R. Condit; Edward R. Condit; O; G
Fraser Connolly; Obsidian Controls; O; DE
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
Wayne David Howell; Artistic Licence Holdings; P; DE
John Huntington; I.A.T.S.E. Local 1; A; U
Sam Kearney; Electronic Theatre Controls, Inc.; P; 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
David McCulloch; David McCulloch; O; U
Daniel Murfin; Royal National Theatre; P; U
Maya Nigrosh; Sonos; P; MP
Jason Potterf; Cisco; P; MP
Mark Primrose; Kino Flo, Inc.; P; CP
Larry Schoeneman; Larry Schoeneman; I; DE
Shawn Silverman; Lighting Infusion LLC; P; DE
Peter Willis; Howard Eaton Lighting Ltd.; P; CP

Visitors:

Jim Bogdanowicz; Kino Flo

1 Opening remarks

Milton Davis called the meeting to order at 09:04, welcoming everyone to the meeting, noting the 50th anniversary of the moon landing today, and asking everyone to silence their cell phones, and to speak loudly because the room is very large.

2 Anti-trust and patent statements

2.1 Reading of the anti-trust statement

Milton Davis read the following statement aloud to the assembly:

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 displayed the easy-to-read pamphlet.

2.2 Reading of the call for patents

Milton Davis read the following statement aloud to the assembly:

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

Milton Davis read the following statement aloud to the assembly:

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.

Richard Nix reminded everyone, if they had not done so already, to please pay their TSP participation fee, or their name will be prominently displayed in the next meeting minutes draft.

3.2 Introduction of attendees

Everyone introduced themselves, and Karl Ruling passed around the strong-colored-but-not-otherwise-exciting green sign-in sheet.

3.3 Determination of a quorum

[There are currently 25 votes possible. A quorum is 9; a supermajority is 13.]

Milton Davis asked for a show of hands of all voting members present and online. He noted that more than 13 were present.

3.4 Processing of new membership and status change requests

The following applications and status change requests have been received:

*John D "Javid" Butler; HDR Consulting, LLC; P; DE (change of representation)
Tucker Downs; Tucker Downs; P (not present, accepted as Observer)
Shawn Silverman; Lighting Infusion, LLC; P; (new application)
Larry Schoeneman; Larry Schoeneman; I; DE (change of representation)*

Vangelis Manolis; AtlaBase; O; CP (new application)

Scott Blair moved to accept the applications for membership, stipulating that those applying for voting status, but who are not present, be accepted as Observers. The motion was seconded and carried.

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:

Robert Haycock; UC Berkeley; U – see 3.5.2

He was not present, so his status was changed to Observer.

3.5.2 Changes due to missed letter ballots

The following voters have missed three consecutive letter ballots and have had their voting status changed to Observer, in accordance with Policies & Procedures outlined in agenda item 3.1.

Robert Goddard; Goddard Design Co.; MP (Requested voting status be restored)
Wayne David Howell; Artistic Licence Holdings; DE (Requested voting status be restored)
Jim Love; Tait Towers Manufacturing LLC; MP (Requested voting status be restored)
Julian Hoare; Tait Towers Manufacturing LLC; MP (Requested voting status be restored)
Robert Haycock; UC Berkeley; U (Not present)
Andrew Berry; X-Laser; MP (Not present)

Scott Blair moved to reinstate those present and requesting reinstatement. The motion was seconded and carried.

3.5.3 Automatic status changes

There were none.

3.6 Consensus body

The table below shows the full consensus voting body as of this meeting, including any changes made at this meeting. Please check the list carefully.

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
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	Status	Int Cat
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Eric Rasmussen	Electronic Theatre Controls, Inc.	A	MP
Robert Goddard	Goddard Design Co.	P	MP
John David (Javid) Butler	HDR Consulting, LLC	P	DE
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
Matthew Ardine	I.A.T.S.E. Local 728	A	U
David Kane	I.A.T.S.E. Local 728	A	U
Mark Primrose	Kino Flo, Inc.	P	CP
Larry Schoeneman	Larry Schoeneman	I	DE
John Valus_Jr.	Lex TM3	P	CP
Shawn Silverman	Lighting Infusion LLC	P	DE
Leroy "Tripp" Oliver, III	Mainstage Theatrical Supply, Inc.	P	DR
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
Jim Love	Tait Towers Manufacturing LLC	P	MP
Julian Hoare	Tait Towers Manufacturing LLC	A	MP
Mitch Hefter	USITT	P	U
Paul Beasley	Walt Disney Company	P	U
Eric Bloom	Westview Productions	P	DR
Total possible votes:			28
Votes by interest category:	Custom market producer (CP):		5
	Designer (DE):		5
	Dealer or rental company (DR):		2
	General interest (G):		1
	Mass-market producer (MP):		11
	User (U):		6

Voting Status key: P = Principal voter, A = Alternate voter, I = Individual voter

4 Approval of the minutes from the last meeting

See CPmin05-2019_DRAFT.pdf

Javid Butler moved to accept the agenda. The motion was seconded, and carried without abstentions or objections.

5 Approval of agenda

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

Michael Lay added 3 items:

- 6.13 E1.37-4
- 6.14 E1.37-5
- 8.6 IES report

Peter Willis added one item:

- 7.5 European plugfest report.

Scott Blair moved to accept the agenda as amended. The motion was seconded and carried unanimously.

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.*

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. (currently in reaffirmation cycle)

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. (currently in reaffirmation cycle)

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. (currently in reaffirmation cycle)

BSR E1.30-11 - 201x, EPI 33, Transport of root PDUs over TCP (Published on 25 June 2019. Revision, reaffirmation or withdrawal by 22 March 2024)

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)

ANSI E1.37-7 - 2019, Additional Message Sets for ANSI E1.20 (RDM) - Gateway and Splitter Configuration (Published on 05 July 2019. Revision, reaffirmation or approval by 04 May 2024)

E1.59 – 201x, Object Transform Protocol (currently in public review cycle)

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.

By the time of this meeting, a TSC letter ballot to reaffirm will have been issued.

It is on the TSC agenda for tomorrow's meeting.

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

By the time of this meeting, a TSC letter ballot to reaffirm will have been issued.

It is on the TSC agenda for tomorrow's meeting.

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

By the time of this meeting, a TSP letter ballot to reaffirm will have been issued.

It is on the TSC agenda for tomorrow's meeting.

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

It's published!

At this time, Wayne Howell reported that the task group has worked on comment resolutions for BSR E1.20. He is summarizing them, and will have a set of proposed resolutions for the next meeting.

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

A BSR9 has been filed with ANSI.

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

It's published!

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

[See BSR_E1-59_PR2_CmmntSummry.pdf]

A summary of public review comments has been distributed to the working group.

A report was given, they are making progress resolving them.

6.9 BSR E1.61 Network Advertisement of Entertainment Protocols

Any news or updates?

Jason Potterf reported that they are making progress.

6.10 BSR E1.68 Recommended Practice to address DMX512 compliance and interoperability

Any news or updates?

Javid Butler reported that a preliminary draft was circulated to the working group, and some comments have been coming back. They will meet twice during this meeting cycle, while in Westlake and will continue to move along.

6.11 Next Gen Streaming Study Group

Any news or updates?

Jason Potterf reported that good information was received during the survey, and they have been focusing on getting the right group of people involved. He shared and explained several slides of a PowerPoint presentation, which was a compilation of the survey results. The PowerPoint presentation is also available for download from the working group's meeting document listfile page. As a result of this research, the study group would like to spin off three additional study groups

Next Gen Color study group Mark Primrose/Tucker Downs
Next Gen Transport: Maya and Jason
Next Gen Fixture study group: Sam Kearney and Dan Murfin.

Scott Blair requested to see the raw data from the survey. It is available.

There was discussion about publishing data.

Bob Goddard applauded the survey information and presentation but also expressed concern for being careful what was said in public, so as not to give the wrong ideas or impressions about what may or may not be coming with future technology. Scott Blair added that we should also be careful in how information is announced so as to better manage public expectations. Jason Potterf reiterated a key statement from the survey, that the information will be used to improve existing technologies, and not to develop new technologies.

Karl Ruling pointed out that there may be some overlap with the NexGen color study group and the Photometrics Working Group.

6.12 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
E1.68 Javid Butler and Wayne Howell
IPv6 Task Group Jason Potterf
Next Gen Streaming Study Group Jason Potterf and Maya Nigrosh
Plugfest Marketing Task Group Michael Lay
NAMM Education Task Group Milton Davis
Task Group Meeting Schedule Liaison Scott Blair
Next Gen Color study group Mark Primrose and Tucker Downs
Next Gen Transport: Maya Nigrosh and Jason Potterf
Next Gen Fixture study group: Sam Kearney and Dan Murfin.

6.13 E1.37-4

Peter Willis reported that they have a task group meeting tomorrow.

6.14 E1.37-5

Scott Blair reported that they are making progress with comment resolutions, and are attempting to have a document ready for review in October.

6.15 E1.20

Wayne Howell reported that they are moving along on comment resolutions and anticipate having a document ready for public review in October.

7 New business

7.1 NAMM education

We have tentatively planned to present the following sessions. A firm list of sessions will be available for the October meeting. If you would like to participate as a panel member on any of these sessions, please contact the session moderator. If you have an idea for additional sessions please contact one of the CPWG co-chairs. Sessions need to be non-commercial and manufacturer agnostic.

Ethernet Networking For The Mid-Sized Venue (Jon Hole)
Troubleshooting Your DMX512 and RDM Control Network (Milton Davis)
An Introduction to E1.33 RDMnet Running Over Ethernet Networks (Scott Blair)
Tightening DMX512-A Compliance In The Entertainment Industry (Javid Butler)
Mythbusting sACN and Art-Net On Your Lighting Network (Wayne Howell)
Wireless DMX512 Networking For The Lighting Tech (Paul Kleissler)
An Introduction To Show Networking (John Huntington)
Advanced Ethernet Networking For Entertainment Systems (Kevin Loewen)

Milton Davis said that additional educational slots are still available, so if anyone has other ideas, they are welcome.

7.2 RDM Document “Bundling” And Suite Overview Document

Scott Blair reported that they have assembled a new RDM/RDMNet document suite index, along with set of zip files containing all of the related documents. He also said that there are issues with a few of the CPWG downloads - e.g. E1.20 bundle with E1.37-1 and E1.37-2 - in which the files have become corrupt, so ESTA staff will need to fix this.

There was a lot of discussion about what was in the new file sets, and how they would be indexed. The consensus is to sort PID's in alphabetical order by PID name. Scott will take care of this, with help from Paul Beasley.

7.3 General Device Type Format (GDTF) activity in Europe

Michael Lay gave a update about the new GDTF activities.

7.4 US Plugfest/Roundtable Update

Scott Blair gave a brief update, saying that Plugfest traffic was a little bit light so far, a few of the regular attendees are not present, but there are new participants including Shawn Silverman – present at this meeting - who has also joined the CPWG. Simon asked Shawn to convey his first impressions. Shawn said that it's been a great experience, he's having fun, and this has already helped him solve issues with his own devices, which he would not have been able to resolve on his own.

7.5 European Plugfest

Peter Willis gave an update, saying that the European Plugfest will be held again in Lille France, during the last week of February 2020 (25-27 February). He said that the location is easily accessible from Paris or London, and he encouraged everyone to attend, if possible.

8 Other business and announcements

8.1 NEC update

From Mitch Hefter:

The 2020 NEC is disallowing the use of Gray Wires in lighting control (i.e., 0-10V architectural control – C82.11 Annex A and forthcoming NEMA C137.1). While not a likely issue for many of our members, I have received inquiries on what that would mean for things such as DMX512 or other control wiring. I will address that (and the proposed alternate to the gray wire). The IES Controls Committee has 3 documents that should be in or completed committee ballots (equivalent to our WG Letter Ballots for Public Review) by the me of our meeting. One of them in particular (the one I authored on Dimming And Control Method Designations) may affect some in the CPWG.

Mitch Hefter gave an update, essentially saying that the agenda text says it all.

NEMA C137.1 will address 0-10v dimming controls, and is suggesting the use of the color pink as a replacement color.

Javid Butler asked about low-voltage LED wiring. This elicited a discussion of perceived wire heating problems with PoE, which Jason Potterf said is largely overblown.

8.2 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.

Milton Davis turned the floor over to Eddie Kramer, who presented an award to Roger Lattin.

8.3 2019 TSP participation fee

[See agenda item 3.1]

A reminder was given during the May WebEx meeting. Email reminders were sent out in June. As of 02 July 2019, there are still CPWG members who have not yet paid their 2019 TSP participation fee.

8.4 IESNA

Bill Ellis gave a report, saying that IESNA is overhauling its organizational structure, and is completely overhauling its lighting handbook. They have appointed liaisons between IESNA and the various partner standards organizations, and he has volunteered to be the liaison between IESNA and the CPWG.

The IES does not own or write the control protocols that are used in lighting, but informs its membership of the control protocols that are used.

The plan is to have all the documents and standards on the website and to update them every three years.

Three documents of note for us:

RP 6

RP 42

And a controls narrative.

8.5 Protocol articles

Michael Lay thanked Javid Butler, Ed Condit, and Bob Goddard for their contribution to articles in the latest edition of Protocol

9 Schedule for future meetings

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

9.1 Fall 2019 meetings (Westlake, TX)

The Fall 2019 TSP meetings will be in Westlake, TX from 24 October thru 27 October 2019. The CPWG is scheduled to meet Saturday 26 October 2019 from 09:00 – 13:00.

The meeting is one month before LDI, so there should be less conflict with meetings and product development being pushed for the trade show.

9.2 Winter 2020 meetings (Anaheim, CA)

The Winter 2020 meetings will again be held in conjunction with the Winter NAMM 2020 show, 15-19 January 2020. The meeting schedule has not yet been confirmed.

9.3 Plugfest July 2020

July Meetings are unconfirmed but will likely be in New York in conjunction with the NATEAC show. This will impact the July Plugfest, which will probably be moved to October next year.

Peter Willis suggested considering a mini plugfest in New York, as it is a good audience. There was discussion about the pros and cons, and the logistics. Michael Lay said they will place this discussion on the Plugfest post-mortem meeting agenda.

10 Adjournment

The agenda being complete, and no further business being brought forth, Michael Lay declared the meeting adjourned at 11:42.

Control Protocols Working Group members as of 10 August 2019

Name	Representing	Status	Int Cat
Cameron Affleck	English National Opera (ENO)	O	U
Christian Allabauer	Christian Allabauer	O	G
Matthew Ardine	I.A.T.S.E. Local 728	A	U
Tim Bachman	Altman Stage Lighting	O	MP
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
Justin Bennett	University of the Incarnate Word	O	U
Andrew Berry	X-Laser	O	MP
Scott M. Blair	Megapixel	P	CP
Eric Bloom	Westview Productions	P	DR
Brent Boulnois	Candela Controls, Inc.	A	DE
Justyn Butler	JBOTS	O	CP
John David (Javid) Butler	HDR Consulting, LLC	P	DE
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
Yongzhi Chen	Guangzhou Haoyang Electronic Co., Ltd.	O	CP
Anthony Chiappone	Chauvet Lighting	O	MP
Martin Chisnall	Martin Chisnall	O	U
Jon Chuchla	Audio Visual Systems, Inc.	O	G
Edward R. Condit	Edward R. Condit	O	G
Gareth Conner	Creative Conners, Inc.	O	MP
Fraser Connolly	Obsidian Controls	O	DE
Chris Conti	PRG	O	DR
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
Tucker Downs	Tucker Downs	O	G
Hamish Dumbreck	James Embedded Systems Engineering	O	MP

Control Protocols Working Group members as of 10 August 2019

Name	Representing	Status	Int Cat
James Eade	ABTT	O	G
Bill Ellis	Candela Controls, Inc.	P	DE
Paul K. Ericson	Stantec	O	DE
Trevor Forrest	Helvar Lighting Control	O	MP
Andrew Frazer	Stellascapes.com	O	MP
Robert Goddard	Goddard Design Co.	P	MP
David Gooch	Chauvet Lighting	O	MP
Sean Goossen	LiteGear, Inc.	O	MP
Jerry Gorrell	Theatre Safety Programs	O	G
Sean Harding	Port Lighting Systems	O	G
Nick Harper	Nick Harper	O	G
Robert Haycock	UC Berkeley	O	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
Leroy "Tripp" Oliver, III	Mainstage Theatrical Supply, Inc.	P	DR
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	Electronic Theatre Controls, Inc.	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
Christian Krueger	Blizzard Lighting LLC	P	MP

Control Protocols Working Group members as of 10 August 2019

Name	Representing	Status	Int Cat
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	P	U
Jason Kyle	JPK Systems Ltd.	O	MP
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
Kevin Loewen	Acuity Brands Inc.	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Rob Love	Insight Lighting	O	MP
Vangelis Manolis	AtlaBase Ltd.	O	CP
David McCulloch	David McCulloch	O	U
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	Larry Schoeneman	I	DE
Ford Sellers	Chauvet Lighting	O	MP
Shawn Silverman	Lighting Infusion LLC	P	DE

Control Protocols Working Group members as of 10 August 2019

Name	Representing	Status	Int Cat
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Christopher B. Tilton	About the Stage, LLC	O	DE
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