

Minutes
Control Protocols Working Group

Saturday, 24 July 2010
Dallas/Ft Worth Marriott Solana
5 Village Circle
Westlake, TX 76262 USA

Chairs:

Michael Lay; Philips Strand Lighting (Royal Philips Electronics); P; MP
Kimberly Corbett; Schuler Shook; P; DE

Recording secretary:

Karl G. Ruling; ESTA

Members attending:

Jean-Francois Canuel; Spectrum Manufacturing Inc. (A.C. Lighting Ltd.); P; CP
Scott M. Blair; High End Systems Inc. (Barco); P; MP
Paul Kleissler; City Theatrical, Inc.; City Theatrical, Inc.; P; MP
Ulrich Kunkel; E3 Engineering & Education for Entertainment GmbH, representing DIN, NVBF Committee;
P; U
Milton Davis; Doug Fleenor Design, Inc.; A; MP
Daniel W. Antonuk; Electronic Theatre Controls, Inc.; P; MP
Robert Goddard; Goddard Design Co.; P; MP
Jody Williquette; Harting Inc., North America (Harting KGAA); P; G
Ed Garstkiewicz; Harting Inc., North America (Harting KGAA); A; G
Peter Willis; Howard Eaton Lighting Ltd.; P; CP
Roger Lattin; I.A.T.S.E .Local 728; P; U
Ken Vannice; Leviton Manufacturing Co., Inc.; P; MP
Michael Karlsson; LumenRadio AB; P; MP
Kevin Loewen; Pathway Connectivity Inc.; P; MP
Ron Bonner; PLASA; P; G
Charles Reese; Production Resource Group; P; DR
Simon Newton; I; G
Mitch Heffer; Entertainment Technology (Royal Philips Electronics), representing USITT; P; U

Visitor:

Richard Cadena; PLSN

1 Opening remarks

The meeting was called to order by Michael Lay at 9:00.

2 Attendance

2.1 Introductions of those present and circulation of attendance sheet

Those present introduced themselves while a green attendance sign-in sheet was circulated.

2.2 Determination of a quorum

Michael Lay announced that a quorum was present and business could be conducted.

2.3 Recognition of alternate voting members

Milton Davis was recognized as voting for Doug Fleenor Design.

3 Membership

3.1 Requirements for membership

Mike Lay read the following statement aloud to the assembly:

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. 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

Voting members who have missed the previous two meetings and will be moved to observer status if this meeting also is missed:

David Yellin; LightMinded Industries, Inc.
Hans Lau & Yngve Sandboe; Sand Network Systems

Mike Lay announced that David Yellin, Hans Lau, and Yngve Sandboe are now observers, since they are not present and had not met the minimum attendance requirements for voting members.

3.3 Processing of new membership requests and reaffirmation of members with new companies

As of 8 July 2010, the following application had been received and logged:

Rob Halliday; observer; user interest category

At this meeting the following observer members requested voting status changes from observer:

- Simon Newton; general interest category; individual voting status
- Jean-Francois Canuel; Spectrum Manufacturing Inc. (A.C. Lighting Ltd.); Custom market producer; principal
- Peter Willis; Howard Eaton Lighting Ltd.; Custom market producer; principal

Roger Lattin moved that the applications be accepted. The motion was seconded and then approved with a show of hands.

3.4 Consensus body

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

Name	Company	Representing	Voting status	Int. cat.
Jean-Francois Canuel	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	P	CP
Tom Grimes	High End Systems, Inc.	Barco	A	MP
Scott M. Blair	High End Systems Inc.	Barco	P	MP
Larry Dunn	City Theatrical, Inc.	City Theatrical, Inc.	A	MP
Paul Kleissler	City Theatrical, Inc.	City Theatrical, Inc.	P	MP
Peter Kirkup	Zero 88	Cooper Controls Ltd.	P	MP
Edward A. (Ted) Paget	Vortek Rigging Division	Daktronics Inc.	P	G
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	DIN, NVBF Committee	P	U
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Doug Fleenor	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Philip Nye	Engineering Arts	Engineering Arts	P	G

Name	Company	Representing	Voting status	Int. cat.
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
Ed Garstkiewicz	Harting Inc., North America	Harting KGAA	A	G
Jody Williquette	Harting Inc., North America	Harting KGAA	P	G
Robert Bell	Horizon Control Inc.	Horizon Control Inc.	A	MP
Gary Douglas	Horizon Control Inc.	Horizon Control Inc.	A	MP
Alan Martello	Horizon Control Inc.	Horizon Control Inc.	P	MP
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
Dennis Grow	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Alan M. Rowe	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	P	U
Ken Vannice	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	P	MP
Tyrone Mellon_Jr.	Lex Products Corp.	Lex Products Corp.	P	CP
Marcus Bengtsson	LumenRadio AB	LumenRadio AB	A	MP
Michael Karlsson	LumenRadio AB	LumenRadio AB	P	MP
Stuart Cotts	Oregon Shakespeare Festival	Oregon Shakespeare Festival	P	U
Dave Higgins	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	MP
Robert Armstrong	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	MP
Kevin Loewen	Pathway Connectivity Inc.	Pathway Connectivity Inc.	P	MP
Ron Bonner	PLASA	PLASA	P	G
Robert Tooker	Production Resource Group	Production Resource Group	A	DR
Charles Reese	Production Resource Group	Production Resource Group	P	DR
Michael Lay	Philips Strand Lighting	Royal Philips Electronics	P	MP
Kimberly Corbett	Schuler Shook	Schuler Shook	P	DE
Simon Newton	Simon Newton	Simon Newton	I	G
Mitch Hefter	Entertainment Technology (Royal Philips Electronics)	USITT	P	U
		Total votes possible	26	
		Votes by interest categories	3	CP
			11	MP
			1	DR
			5	U
			5	G
			1	DE

4 Approval of the minutes from the March 2010 meeting

See CPmin03-2010.pdf

Roger Lattin moved that the minutes be approved as written. The motion was seconded and then approved with a show of hands.

5 Reading of the call for patents

The following statement was aloud to the assembly by Kimberly Corbett:

"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 or 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."

No patents or other protected intellectual property were reported to the assembly.

6 Reading of the anti-trust statement

The following statement was aloud to the assembly by Kimberly Corbett:

"The ESTA Board of Directors, the Technical Standards Committee, and the leadership of this working group will reject or nullify any actions that unlawfully restrain trade. Anyone who feels that such an action is being or has been taken is requested to bring that matter to the attention of the chair immediately. Anyone who feels that actions in restraint of trade have been taken and not properly annulled is requested to notify the TSC chair or ESTA president immediately.

"ESTA legal counsel has informed us that violations of the anti-trust laws can have serious consequences. Individuals engaged in certain unlawful conduct can be found criminally liable. An individual convicted of a criminal violation of the Sherman Act may be fined as much as \$1,000,000 and imprisoned for up to ten years. An easy to read pamphlet describing restraint of trade issues is available from the Technical Standards Manager."

An easy-to-read pamphlet was held aloft by the Technical Standards Manager to show copies were available at the meeting. No restraint of trade issue were reported to the assembly.

7 Approval of agenda

Simon Newton asked that report be added to the agenda about an open-source project integrating ACN, RDM, and other protocols.

Mitch Hefter asked for an agenda item to give an update on the IESNA lighting control protocols summary document.

Peter Willis asked for an agenda item in which we can discuss future meeting dates.

Scott Blair moved that the revised agenda be accepted. The motion was seconded. The motion was approved with a show of hands.

8 Old business

Mike Lay went through the standards maintenance items in 8.1 asking for any comments or concerns.

8.1 Standards Maintenance. Any news or action needed on any of these standards? This is a placeholder in the agenda, so we don't forget to maintain them.

ANSI E1.3 – 2001 (R2006), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification. Revision, reaffirmation or withdraw in 2011.

Bob Goddard asked about starting to think of reaffirming it. It is a useful, albeit not cutting edge, standard. Mike Lay suggested that we discuss this at the LDI meeting.

ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories. Revision, reaffirmation or withdraw in 2013.

ANSI E1.27-1 – 2006, Entertainment Technology - Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A) Products. Revision, reaffirmation or withdraw in 2011.

ANSI E1.27-2 – 2009, 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 withdraw in 2014.

ANSI E1.30-3 – 2009, EPI 25, Time Reference in ACN Systems Using SNTP and NTP. Revision, reaffirmation or withdraw in 2014.

ANSI E1.30-7 – 2009, EPI 29, Allocation of Internet Protocol Version 4 Addresses to ACN Hosts. Revision, reaffirmation or withdraw in 2014.

ANSI E1.30-10 – 2009, EPI 32, Identification of Draft Device Description Language Modules. Revision, reaffirmation or withdraw in 2014.

ANSI E1.31 – 2009, Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN. Revision, reaffirmation or withdraw in 2014.

8.2 BSR E1.20-20xx, Remote Device Management (revision of ANSI E1.20 - 2006)

Letter Ballot to accept BSR E1.20 - 20xx as an American National Standard - Ballot period: 1 July through 29 July 2010

There was a discussion of the process, and the response rate so far. Karl Ruling thanked people for sending him the non-substantive editorial corrections they see that need to be made.

8.3 BSR E1.37-1, Additional Message Sets for ANSI E1.20, Remote Device Management

In Public Review - 11 June 2010 through 26 July 2010.

Ruling reported that a few comments had been received.

Scott Blair reported that the task group may want to develop an E1.37-2 document focusing on message sets for LED and video devices. This may be proposed to the CPWG as a project in 2011.

8.4 BSR E1.17, Architecture for Control Networks revision project

In Public Review - July 9 2010 through August 23 2010.

Karl Ruling reported that no comments had been received so far.

Dan Antonuk moved that we vote by letter ballot to accept the draft document as an ANS if it nets no comments. The motion was seconded and then approved with a show of hands, with all voting in favor except for one abstention. This was a supermajority.

8.5 BSR E1.30, Application level equipment interoperability for control of commonly encountered entertainment technology devices using E1.17

8.5.1 BSR E1.30-1, EPI 23 Device Identification Subdevice

Letter Ballot to accept BSR E1.30-1 as an American National Standard. Ballot period: 1 July through 29 July 2010

Ruling gave a brief update on the progress of the vote. He explained that the DDL assumed in the draft standard is the one in the revised version of ACN. If it is accepted as an ANS, we will need to hold the publication until new DDL is published.

8.5.2 BSR E1.30-2, EPI 24 Internet Protocol Properties Subdevice

Report on progress. Task Group was optimistic in Nov 2009 that we would have a document for the April USITT meeting, but no progress was reported at the January session. At the March session, a draft document was promised for the July meeting.

Antonuk reported disagreement within the task group on how to handle multi-homing (multiple IP addresses with one device). There are popular complicated ways, and less popular simpler ways to accomplish this.

The next deliverable was retargeted to October.

8.5.3 BSR E1.30-4, EPI 26, (DDL) Extensions for DMX512 and E1.31 Devices

Summary of Control Protocols Working Group Letter Ballot to Accept BSR E1.30-4 as an American National Standard: Results: The motion carried with the required super-majority, with 18 Yes votes out of voting body of 26.

Karl Ruling reported that the motion to accept BSR E1.30-4 as an ANS is on the ESTA Board meeting agenda.

8.5.4 BSR E1.30-8, EPI 30 Time Code Properties

Task Group was originally optimistic in November that we would have a draft resolution document for this meeting, however this slipped to July in the January meeting. At the March 2010 session, the Task Group was working towards a document for the July 2010 meeting but thought this might be unlikely.

Dan Antonuk reported that little progress has been made recently with this project. The next deliverable was retargeted to the January 2011 meeting.

8.5.5 BSR E1.30-9, EPI 31 MIDI System Exclusive Properties

Task Group was originally optimistic in November that we would have a draft resolution document for the January meeting, however has been slipped to the March meeting. At the March 2010 session, the Task Group committed to a document for the July 2010 meeting.

Dan Antonuk reported that little progress has been made recently with this project. The next deliverable was retargeted to the January 2011 meeting.

8.5.6 BSR E1.30-11, EPI 33, MetaData Device Identification Subdevice.

Report on project announcement, and progress report from the Task Group. At the March 2010 session the Task Group reported forward progress on this document.

Dan Antonuk reported that little progress has been made recently with this project. The next deliverable was retimed for the March 2011 meeting.

Antonuk explained that EPI 33 is for a means of attaching different information to device properties, such as "This dimmer controls the curtain warmers."

8.5.7 BSR E1.30-12, EPI 34, E1.31 Universe Synchronization.

Report on project announcement, and progress report from the Task Group. At the March 2010 session the Task Group reported no progress on this document.

Antonuk reported that this EPI had been suggested by Alan Martello with great energy. However, since then been prioritized behind the other EPI projects. It is aimed at working with ANSI E1.31.

8.6 BSR E1.33, Extensions to E1.31 for Transport of ANSI E1.20 (RDM)

Task Group was optimistic in November that we would have a draft document for the July meeting, however a first public review vote will not probably occur until the LDI 2010 session.

Scott Blair reported on the progress. They have learned a lot more about SLP. It's an open standard, but they are trying to use a slimmed down sub-set of it for their purposes.

Dan Antonuk reported that ETC will test the E1.33 implementation of SLP to make sure it works and is scalable.

Kimberly Corbett asked for a time for a draft. Blair said that he was reluctant to state a date because as he gets into the project he discovers more and more about how big it is. That said, he is hopeful for a draft by January 2011.

8.8 CPWG marketing efforts

8.8.1 LDI Sessions

Mike Lay asked the moderators to get working on the LDI sessions. People pay money for these sessions, so they need to have value!

Scott Blair said that they plan to move away from PowerPoint sessions and toward hands-on demos. LDI has given us one room for the day to do this. He and his colleagues are working on having enough equipment to populate the Connectivity Booth and the LDI sessions at the same time. He said they will coordinate the equipment requests so that we don't have multiple people contacting manufacturers for equipment for different sessions.

Scheduled sessions:

Saturday, October 23, 2010 11am-12:30pm

I Didn't Know RDM Could Do That! (0.75 ETCP Renewal Credits)

Members of the ESTA Control Protocols Working Group demonstrate useful applications of the ANSI E1.20 - 2006 - Entertainment Technology Remote Device Management over USITT DMX512 Networks standard. Watch and listen as the authors of this standard use a wide array of manufacturers products from the LDI show floor to demonstrate the time and labor saving features of systems using this control protocol. Moderator: Scott Blair, High End Systems Panelists: Milton Davis, Doug Fleenor Design; Robert Goddard, Goddard Design; Robert Tooker, PRG; Ulrich Kunkel, E3 Engineering & Education for Entertainment

Saturday, October 23, 2010 1:30-3:00pm

I Didn't Know ACN Could Do That! (0.75 ETCP Renewal Credits)

Members of the ESTA Control Protocols Working Group demonstrate useful applications of the ANSI E1.17 - 2006 - Entertainment Technology - Architecture for Control Networks. Watch and listen as the authors of this standard use a wide array of manufacturers products from the LDI show floor to demonstrate the time and labor saving features of systems using this control protocol. Moderator: Dan Antonuk, ETC Panelists: Philip Nye, Engineering Arts; Alan Martello, Horizon Control; John Huntington, City Tech, Entertainment Tech Department; Ulrich Kunkel, E3 Engineering & Education for Entertainment; Kevin Loewen, Pathway Connectivity

Saturday, October 23, 2010 3:30-5:00pm

ACN and RDM-Perfect Together! (0.75 ETCP Renewal Credits)

Members of the ESTA Control Protocols Working Group demonstrate the seamless use of the ACN and RDM standards using a wide array of manufacturers products. Let the CPWG demonstrate for you "when it makes sense" to use both of these control protocols in a single system.

Moderators: Dan Antonuk, ETC and Scott Blair, High End Systems

Panelists: Milton Davis, Doug Fleenor Design; Robert Tooker, PRG; Philip Nye, Engineering Arts; Alan Martello, Horizon Control; John Huntington, City Tech, Entertainment Tech Department; Ulrich Kunkel; E3 Engineering & Education for Entertainment

8.8.2 LDI Connectivity Pavilion

With the unfortunate absence of Peter Willis from LDI this year, a task group was created from volunteers willing to organize this years Connectivity Pavilion exhibition. The task group consists of Bill Ellis (Chair), Wayne Howell, Peter Kirkup, Michael Karlsson, Marcus Bengtsson and Storm Staley.

There was discussion of the Pavilion project. Peter Willis explained that HELL won't pay for him to attend LDI, but that HELL won't oppose his participation with funding from others. Roger Lattin said that he would arrange for IATSE to provide a room for Peter Willis if he could arrange to attend.

8.8.3 Protocol Articles

Report from Milton Davis & Dan Antonuk on progress

Michael Lay offered kudos to Milton Davis for his recent article about RDM in *Protocol*.

Bob Goddard said he has been testing EIA 485 driver ICs and has data on their performance that he wishes to turn into an article. The tables of data could be posted on the ESTA website.

Peter Willis mentioned the importance of power supply bypassing with EIA 485 drivers. During the RDM discovery process the devices are driving against each other, with some trying to force a high while others are trying to force a low. This can result in high peak currents.

8.8.4 July Plugfest

Scott Blair reported that the Plugfest is working. Now they are having space issues. The Plugfest needs a larger space.

9 New business

None.

10 Other business

10.1 Open ACN

Philip Nye was not present, but Dan Antonuk reported that Shure has paid people to work on developing Open ACN. ETC is testing it. They have an application to play tick-tac-toe on two linked Macintosh computers using ACN. He is confident that something will be developed and available by LDI.

Antonuk also reported that there are C libraries for the E1.31 and for E1.17. The files are posted on the Open Source and ETC websites.

10.2 IEEE Update

Update from Steve Carlson. See IEEE_Update_July_2010.pdf

There was no further report delivered at the meeting.

10.3 IESNA control protocols document

Mitch Heffer reported that the document is better. It is not inaccurate, but it is clunky.

10.4 Open RDM update

Simon Newton reported that he is the author of Open Lighting Architecture, an open source framework project that supports a wide range of our protocols. It is hosted on one of the open source websites, <http://www.opendmx.net>.

10.5 Other other business

None.

11 Schedule for future meetings

Michael Lay reported that the next meeting is scheduled for Thursday, 21 October 2010, from 09:00 to 13:00 at the Las Vegas Hilton during the LDI 2010 trade show in Las Vegas, Nevada. Then the following meeting is scheduled for Monday, January 24 from 9:00 in the morning at the Marriott Solana in Westlake, TX.

Peter Willis suggested that the summer meetings be moved to late June to make European participation easier. Many European companies close for vacation in late July and August.

12 Adjournment

Kevin Loewen moved that the meeting adjourn. The motion was seconded. The motion was approved with a show of hands. Kimberly Corbett announced the meeting adjourned at 11:07.

Working Group Membership and Contact Information as of 18 August 2010

Name	Company	Representing (This is the sort field.)	Voting status	Int. cat.
Tracy Underhill	4U Consulting	4U Consulting	O	G
Jean-Francois Canuel	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	P	CP
Tim Bachman	A.C.T Lighting, Inc.	A.C.T Lighting, Inc.	O	DR
Larry Busch	ADB Lighting Technologies	ADB Lighting Technologies	O	MP
John Sellers	AIM Northwest	AIM Northwest	O	G
André Broucke	André Broucke	André Broucke	O	G
Jon Lenard	Applied Electronics	Applied Electronics	O	MP
Arnold Tang	Arnold Tang Productions	Arnold Tang Productions	O	U
Wayne David Howell	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	O	CP
Simon Hobday	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	O	CP
Steve Friedlander	Auerbach Pollock Friedlander	Auerbach Pollock Friedlander	O	U
J. B. Toby	Avolites Ltd.	Avolites Ltd.	O	MP
Shahid Anwar	Avolites Ltd.	Avolites Ltd.	O	MP
Richard Salzedo	Avolites Ltd.	Avolites Ltd.	O	MP
Barbara Wohlsen	Barbara Wohlsen	Barbara Wohlsen	O	U
Tobin Neis	Barbizon Companies	Barbizon Companies	O	DR
Tom Grimes	High End Systems, Inc.	Barco	A	MP
Scott M. Blair	High End Systems Inc.	Barco	P	MP
Jiantong Wu	Beijing Special Engineering Design & Research Institute	Beijing Special Engineering Design & Research Institute	O	G
Bernardo Benito Rico	Ben-Ri Electronica S.A.	Ben-Ri Electronica S.A.	O	MP
Lee J. Bloch	Bloch Design Group, Inc.	Bloch Design Group, Inc.	O	G
Soo-Myong Chung	Bloch Design Group, Inc.	Bloch Design Group, Inc.	O	G
Bill Ellis	Candela Controls, Inc.	Candela Controls, Inc.	O	U
Will Wagner	Carallon Ltd.	Carallon Ltd.	O	MP

Name	Company	Representing (This is the sort field.)	Voting status	Int. cat.
Steve Roberts	Carr & Angier	Carr & Angier	O	G
Bob Toms	Catalyst Microsystems LLC	Catalyst Microsystems LLC	O	G
Chuck Seifried	Phoenix Civic Plaza	City of Phoenix	O	U
Larry Dunn	City Theatrical, Inc.	City Theatrical, Inc.	A	MP
Paul Kleissler	City Theatrical, Inc.	City Theatrical, Inc.	P	MP
Fabiano Pina	Clay Paky S.P.A.	Clay Paky S.P.A.	O	MP
Yehuda Shukram	Compulite Systems	Compulite Systems	O	MP
Dietmar Rottinghaus	Connex GmbH	Connex GmbH	O	G
Paul Kenneth McEwan	Zero 88	Cooper Controls Ltd.	O	MP
Peter Kirkup	Zero 88	Cooper Controls Ltd.	P	MP
Edward A. (Ted) Paget	Vortek Rigging Division	Daktronics Inc.	P	G
David Bertenshaw	David Bertenshaw	David Bertenshaw	O	G
Larry Schoeneman	DesignLab Chicago, Inc.	DesignLab Chicago, Inc.	O	DR
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	DIN, NVBF Committee	P	U
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Doug Fleenor	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Gary Dove	Dove Systems	Dove Systems	O	MP
Jerry Durand	Durand Interstellar, Inc.	Durand Interstellar, Inc.	O	CP
Jussi Kallioinen	Eastway Sound & Lighting	Eastway Sound & Lighting	O	U
Edward R. Condit	Edward R. Condit	Edward R. Condit	O	G
Ed Jones	Edwin Jones Co., Inc.	Edwin Jones Co., Inc.	O	CP
Joost van Eenbergen	ELC Lighting	ELC Lighting	O	MP
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Adam Bennette	Electronic Theatre Controls Ltd.	Electronic Theatre Controls, Inc.	O	MP
Hans Leiter	ETC GmbH	Electronic Theatre Controls, Inc.	O	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP

Name	Company	Representing (This is the sort field.)	Voting status	Int. cat.
Ralph Weber	ENDL Texas	ENDL Texas	O	G
Philip Nye	Engineering Arts	Engineering Arts	P	G
Eric Johnson	Eric Johnson	Eric Johnson	O	MP
Eric Proces	Eric Proces	Eric Proces	O	U
Erwin Rol	Erwin Rol Software Engineering	Erwin Rol	O	G
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
Sierk Janszen	Kiss Box	Ground Zero	O	U
Ed Garstkiewicz	Harting Inc., North America	Harting KGAA	A	G
Jody Williquette	Harting Inc., North America	Harting KGAA	P	G
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	O	MP
Bill Hewlett	Hewlett Electronics	Hewlett Electronics	O	CP
Steve Carlson	High Speed Design, Inc.	High Speed Design, Inc.	O	MP
Kirk D. Keen	Hollywood Lighting Services, Inc.	Hollywood Lighting, Inc.	O	DR
Robert Bell	Horizon Control Inc.	Horizon Control Inc.	A	MP
Gary Douglas	Horizon Control Inc.	Horizon Control Inc.	A	MP
Alan Martello	Horizon Control Inc.	Horizon Control Inc.	P	MP
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
Paul J. Clark	HxDx	HxDx	O	CP
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
Dennis Grow	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Alan M. Rowe	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	P	U
Geoffrey O. Thompson	Nortel Networks, Inc.	IEEE 802.3/Nortel Networks	O	G
John (Javid) D. Butler	Integrated Theatre, Inc.	Integrated Theatre, Inc.	O	CP
Michael (Mike) Whetstone	Integrated Theatre, Inc.	Integrated Theatre, Inc.	O	CP

Name	Company	Representing (This is the sort field.)	Voting status	Int. cat.
Rob Johnston	Interactive Technologies, Inc.	Interactive Technologies, Inc.	O	MP
Hamish Dumbreck	JESE Ltd.	James Embedded Systems Engineering	O	MP
David Timmins	Jands Electronics	Jands Electronics	O	MP
Helge Hoffmann	JB Lighting	JB Lighting	O	MP
Josh Gubler	Josh Gubler	Josh Gubler	O	CP
John Mehlretter	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	MP
Mark T. Kraft	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	MP
Rick Leinen	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	O	MP
Ken Vannice	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	P	MP
Lars Wernlund	Lewlight	Lewlight	O	MP
Tyrone Mellon_Jr.	Lex Products Corp.	Lex Products Corp.	P	CP
Klaus Amling	Licht-Technik	Licht-Technik	O	MP
David Yellin	LightMinded Industries, Inc.	LightMinded Industries, Inc.	O	MP
Andrew Sherar	Lightmoves PLC	Lightmoves PLC	O	MP
Avraham Mendall Mor "Avi"	Lightswitch	Lightswitch	O	U
Simon Alpert	Lighttech Event Technologies	Lighttech Event Technologies	O	CP
Gary Pritchard	LSC Lighting Systems (Aust) PTY Ltd	LSC Lighting Systems PTY Ltd	O	MP
Marcus Bengtsson	LumenRadio AB	LumenRadio AB	A	MP
Michael Karlsson	LumenRadio AB	LumenRadio AB	P	MP
Bart Swinnen	Luminex LCE	Luminex LCE	O	MP
Jim Holladay	Luxence	Luxence	O	G
Torben Kaas Rasmussen	Martin Professional A/S	Martin Professional A/S	O	G
Hiroshi Kita	Marumo Electric Co., Ltd.	Marumo Electric Co., Ltd.	O	MP
Stuart Cotts	Oregon Shakespeare Festival	Oregon Shakespeare Festival	P	U
David A. Boller	Organic Machines LLC	Organic Machines LLC	O	CP
William Benner	Pangolin Laser Systems	Pangolin Laser Systems	O	MP

Name	Company	Representing (This is the sort field.)	Voting status	Int. cat.
Dave Higgins	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	MP
Robert Armstrong	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	MP
Kevin Loewen	Pathway Connectivity Inc.	Pathway Connectivity Inc.	P	MP
James Eade	PLASA	PLASA	O	G
Ron Bonner	PLASA	PLASA	P	G
Robert Tooker	Production Resource Group	Production Resource Group	A	DR
Charles Reese	Production Resource Group	Production Resource Group	P	DR
Paul F. Mardon	Pulsar Ltd.	Pulsar Ltd.	O	MP
Steve Unwin	Pulsar Ltd.	Pulsar Ltd.	O	MP
Stephen J. Tyrrell	Quantum Logic	Quantum Logic	O	MP
Douglas Franz	QVC Network	QVC Network	O	U
Andrew Eales	Wellington Institute of Technology	Rhodes University	O	U
Osedum P. Igumbor	Dept. of Computer Science	Rhodes University	O	U
Nyasha Chigwamba	Dept. of Computer Science	Rhodes University	O	U
Charlie Richmond	Richmond Sound Design Ltd.	Richmond Sound Design Ltd.	O	CP
Rob Halliday	Rob Halliday	Rob Halliday	O	U
Martin Farnik	Robe Show Lighting s.r.o.	Robe Show Lighting s.r.o.	O	MP
Mike Blackwell	Philips/Color Kinetics	Royal Philips Electronics	O	MP
John Warwick	Philips/Color Kinetics	Royal Philips Electronics	O	MP
Michael Lay	Philips Strand Lighting	Royal Philips Electronics	P	MP
Hans Lau	Sand Network Systems, Inc.	Sand Network Systems, Inc.	O	MP
Yngve Sandboe	Sand Network Systems, Inc.	Sand Network Systems, Inc.	O	MP
Kimberly Corbett	Schuler Shook	Schuler Shook	P	DE
Lars F. Paape	Scientific Algorithms and Embedded Systems	Scientific Algorithms and Embedded Systems	O	U
Mick Martin	ShowCAD Control Systems	ShowCAD Control Systems	O	MP
Loren Wilton	Showman Systems	Showman Systems	O	CP

Name	Company	Representing (This is the sort field.)	Voting status	Int. cat.
Mark Manthei	Shure Inc.	Shure Inc.	O	G
Kehang Wu	Shure Inc.	Shure Inc.	O	G
Simon Newton	Simon Newton	Simon Newton	I	G
Jon R. Farley	Sixteenth Avenue Systems	Sixteenth Avenue Systems	O	CP
Robert Barbagallo	Solotech Inc.	Solotech Inc.	O	U
Ujjal Kar	Standard Robotics & Lighting	Standard Robotics & Lighting	O	G
Storm K. Staley	Stormwerx	Stormwerx	O	U
Paul K. Ericson	Syska Hennessy Group Lighting Design	Syska Hennessy Group Lighting Design	O	U
Stephen Bickford	T. Kondos Associates	T. Kondos Associates	O	U
Tad Trylski	Tad Trylski	Tad Trylski	O	U
Klas Dalbjorn	Labgruppen AB	TC Group	O	MP
Dominic Vincenty	TPS	Television Production Service	O	DR
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	O	G
Colin Waters	TMB	TMB	O	DR
Phillip M. Gallo	TMB	TMB	O	DR
Sean Harding	Trinity Repertory Company	Trinity Repertory Company	O	U
Mitch Hefter	Entertainment Technology (Royal Philips Electronics)	USITT	P	U
Torrey Bievenour	Vision Quest Lighting	Vision Quest Lighting	O	G
Eric Cornwell	West Side Systems	West Side Systems	O	U
Ben Darrington	Wireless Solutions Sweden AB	Wireless Solutions Sweden AB	O	MP
John Sondericker_III	Wybron, Inc.	Wybron, Inc.	O	MP
Larry Zoll	Zoll Design & Consulting, LLC	Zoll Design & Consulting, LLC	O	U

Key to codes:

P principal voting member
A alternate voting member
I individual voting member
O observer, non-voting

MP mass-market producer interest category
CP custom-market producer interest category
DR dealer or rental company interest category
U user interest category
G general-interest interest category

DE designer