

Minutes
Control Protocols Working Group

Saturday, 26 January 2008
Dallas/Ft. Worth Airport Marriott South
Ft. Worth, Texas.

Presiding chairman: Tracy Underhill; Electronics Diversified LLC; P; MP

Recording secretary: Karl G. Ruling; ESTA

Members attending: Jean-Francois Canuel; Spectrum Manufacturing Inc. (A.C. Lighting Ltd.); P; CP
Edward A. (Ted) Paget; Vortek Rigging Division (Daktronics Inc.); P; G (joined at this meeting)
Doug Fleenor; Doug Fleenor Design, Inc.; P; MP
Steve Terry; Electronic Theatre Controls, Inc.; A; MP
Robert Goddard; Goddard Design Co.; P; MP
Scott M. Blair; High End Systems Inc.; P; MP
Peter Willis; Howard Eaton Lighting Ltd.; P; CP
Edwin S. Kramer; I.A.T.S.E. Local 1; P; U
Roger Lattin; I.A.T.S.E. Local 728; P; U
John (Javid) D. Butler; Integrated Theatre, Inc.; P; CP
Ken Vannice; Colortran (Leviton Manufacturing Co., Inc.); A; MP
Tyrone Mellon Jr.; Lex Products Corp.; P; CP (joined at this meeting)
Dave Higgins; Pathway Connectivity Inc.; A; MP
Ron Bonner; PLASA; P; G
Robert Tooker; Production Resource Group; A; DR
Kimberly Corbett; Schuler Shook; P; G
Mitch Hefter; Entertainment Technology (Royal Philips Electronics), representing USITT; P; U (new parent company)

Visitors: Phillip M. Gallo: TMB
Louis Bradfield,; Bally's Las Vegas

1 Opening remarks

Tracy Underhill called the meeting to order at 14:04. He said that Michael Lay was on vacation.

2 Attendance

2.1 Introductions of those present and circulation of attendance sheet

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

2.2 Determination of a quorum

Tracy Undershill asked for a show of hands of principal voters. He counted them and then announced that a quorum was present.

2.3 Recognition of alternate voting members

Alternate voting members were recognized. There were no alternates present with their principal.

3 Membership

3.1 Requirements for membership

The following statement was read aloud by Tracy Underhill 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 Processing of new membership requests and reaffirmation of members with new companies

Three people had applied for membership:

Tyrone Mellon Jr.; Lex Products; P; CP

Ted Paget; Vortek Rigging (Daktronics); P;

Mitch Hefter; ET (now owned by Royal Philips Electronics) representing USITT:

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

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

Name	Company	Representing	Voting status	Interest category
Jean-Francois Canuel	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	P	CP
Wayne David Howell	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	P	CP
Simon Hobday	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	A	CP
Edward A. (Ted) Paget	Vortek Rigging Division	Daktronics Inc.	P	G
Ulrich Kunkel	E3 Engineering & Education for Entertainment	DIN, NVBF Committee	P	U
Doug Fleenor	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Ken Wagner	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Tracy Underhill	Electronics Diversified LLC	Electronics Diversified LLC	P	MP
Philip Nye	Engineering Arts	Engineering Arts	P	G
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
Scott M. Blair	High End Systems Inc.	High End Systems Inc.	P	MP
Tom Grimes	High End Systems, Inc.	High End Systems, Inc.	A	MP
Alan Martello	Horizon Control Inc.	Horizon Control Inc.	P	MP
Robert Bell	Horizon Control Inc.	Horizon Control Inc.	A	MP
Gary Douglas	Horizon Control Inc.	Horizon Control Inc.	A	MP
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	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
John (Javid) D. Butler	Integrated Theatre, Inc.	Integrated Theatre, Inc.	P	CP
Michael (Mike) Whetstone	Integrated Theatre, Inc.	Integrated Theatre, Inc.	A	CP
Rick Leinen	Colortran	Leviton Manufacturing Co., Inc.	P	MP
Ken Vannice	Colortran	Leviton Manufacturing Co., Inc.	A	MP
Tyrone Mellon Jr.	Lex Products Corp.	Lex Products Corp.	P	CP
Stuart Cotts	Oregon Shakespeare Festival	Oregon Shakespeare Festival	P	U
Kevin Loewen	Pathway Connectivity Inc.	Pathway Connectivity Inc.	P	MP
Dave Higgins	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	MP
Ron Bonner	PLASA	PLASA	P	G
Charles Reese	Production Resource Group	Production Resource Group	P	DR
Robert Tooker	Production Resource Group	Production Resource Group	A	DR

Name	Company	Representing	Voting status	Interest category	
Michael Lay	Strand Lighting	Royal Philips Electronics	P	MP	
Hans Lau	Sand Network Systems, Inc.	Sand Network Systems, Inc.	P	MP	
Yngve Sandboe	Sand Network Systems, Inc.	Sand Network Systems, Inc.	A	MP	
Kimberly Corbett	Schuler Shook	Schuler Shook	P	G	
Mark Manthei	Shure Inc.	Shure Inc.	P	G	
Mitch Hefter	Entertainment Technology (Royal Philips Electronics)	USITT	P	U	
			Total votes	26	
			Votes by interest category	5	CP
				10	MP
				1	DR
				5	U
				5	G

4 Approval of the minutes from the previous meeting

See CP/2007-1014, file name CPmin11-2007.pdf

Steve Terry moved that the draft minutes be accepted. The motion was seconded and then approved with all voting in favor, except for two abstentions.

5 Reading of the call for patents

The following statement was read aloud to the assembly by Tracy Underhill:

"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 protected intellectual property was reported to the assembly.

6 The reading of the anti-trust statement

The following statement was read aloud to the assembly by Tracy Underhill:

"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."

Karl Ruling, the Technical Standards Manager, held up a few of the easy-to-read pamphlets to show that they were readily available.

No restraint of trade issues were reported.

7 Approval of agenda

Eddie Kramer moved that the draft agenda be approved. The motion was seconded and then accepted with a unanimous show of hands.

8 Old business

8.1 ANSI E1.3-2001 (R2006)

No news, no action needed.

8.2 E1.11/DMX512-A Recommended Practice

Steve Terry said he is happy to report that Adam Bennett sent him a 7 megabyte file, a first draft of the revision. He says it is pretty much on target for what is needed. It will now be reviewed informally, and we should have a version for wider review in three to four weeks.

8.3 ANSI E1.11 (DMX512-A) Revision

See CP2007-1013r1_E1-11.pdf and CP2007-1013r1_E1-11Redline.pdf

Mitch Hefter reported that the document submitted for this meeting is the same as what was submitted at the last meeting, except for some typo corrections.

Doug Fleenor moved that the sentence "UTF-8 should only be used with the text packet cannot be expressed in ASCII per clause D2," be added to the UTF-8 clause. The motion was seconded. The motion was approved with sixteen voting in favor and one abstention (plus the chairman) by a show of hands. With a voting body of 26 and no negative votes, 16 is a supermajority.

Mitch Hefter moved that BSR E1.11-200x be offered for public review. The motion was seconded. The motion will be decided by letter ballot.

8.4 ANSI E1.20-2006, Remote Device Management

What do we do about the errata?

Scott Blair moved that we start the process of revising ANSI E1.20. The motion was seconded, and then approved by a unanimous show of hands.

Scott Blair said that the errata should be ready for the next meeting. At that point, we can offer it for public review.

8.5 E1.17 Multipurpose Control Network Protocol Suite

It's published, but parts of the document are impossible to search. Dan Antonuk has been compiling a list of errata. See the minutes of the March 2007 meeting.

Steve Terry reported that Dan Antonuk has suffered a pseudo-aneurism of the carotid artery. Unfortunately the aneurism is not operable. All that can be done is to wait for it to heal. This has slowed his work. He is only working part-time.

8.6 E1.27-X, cabling

8.6.1 ANSI E1.27-1-2006 (portable DMX512/E1.11 cabling)

No news, said Javid Butler.

8.6.2 BSR E1.27-2 (permanent DMX512/E1.11 cabling)

Discussion of public review comments. See SmmryE1-27-2_ScndCmmnts.pdf.

Javid Butler reported on the number of comments and work being done to draft some possible resolutions. He asked for the working group to consider comment number 1:

- 1 **General** Withdraw the draft and do not proceed with an ESTA DMX512 permanent cabling standard.

Substantiation: The scope and content of this document are fatally flawed. In its current form, the document attempts to be both prescriptive and permissive at the same time. The standard attempts to define and specify a cable plan for permanent installation in a building, but it wanders at various points into requirements for the actual equipment connecting to that cable plan.

Here is the problem: We have at least 21 years of worldwide installed base of DMX512 cable plans. These installations include a huge variety of successful engineering solutions, many of which are not covered by this draft standard or are in direct conflict with the content of the draft. It is fine to state that "compliance with this standard is strictly voluntary", but that is not how the entertainment industry operates in 2007. The appearance of this standard will make its contents the de facto "right" way to install a cable plan, not simply "one option you have for installing a cable plan". By being overly prescriptive in certain areas, it limits the available engineering solutions, without fundamentally improving system interoperability, reliability, simplicity, or cost effectiveness.

For instance, the number of pairs wired to a DMX512 connector is specified in section 6. We will address the specifics of this in a subsequent comment, but it highlights one of the major problems with issuing this type of prescriptive standard 21 years after DMX512 was adopted. We have been waiting 21 years for a standardized use of pins 4 and 5 to emerge, yet none has surfaced. So, the standard prescribes an approach that is, for all intents and purposes, at odds with the reality of the vast majority of installed systems. As an example of this, ETC, which is one of the largest manufacturers and system installers in the world, has provided only one pair on DMX connectors in more than 25 thousand installations worldwide. So, as written, the standard is attempting to define a "new and better" cable plan, which is grossly at odds with a very high percentage of current practice.

The *raison d'être* for E1.27 as a separate standard is that the E1.11 Task Group and the ESTA CPWG could not achieve consensus on many of the very issues that are contentious in the current draft. In an effort to break a logjam of more than five years that was preventing a sorely needed revision of DMX512, the CPWG voted to remove all references to cabling from E1.11. The problem is that many of those issues that created the logjam for E1.11 have simply been transferred to the draft of E1.27-2. The likelihood of achieving consensus on these issues has not improved, and causes the draft to be a weak document in attempting to be prescriptive and permissive simultaneously, presumably in an attempt to build a consensus that will be difficult or impossible to achieve.

There is no good solution to this. The unfortunate reality is that this is simply an area where a standard does not belong 21 years after the adoption of DMX512. The failure of this type of content to achieve consensus in any version of E1.11 proves this point.

Dan Antonuk
Electronic Theatre Controls

Javid Butler moved that we reject comment number 1. The motion was seconded. There was discussion.

Steve Terry spoke against the motion. The original 1986 standard was silent on cable topologies, and every DMX512 standard since has been silent. The market made solutions, and there are a wide range of cabling solutions in the market. He argued that it is too late now to say how it needs to be done. The specifics of the standard are not important; whatever it says will be different from a significant part of the installed base. Even if we do write a standard, it will not help interoperability.

There was further discussion. Bob Goddard suggested simply making the document a recommended practice, an advisable way to do it. Terry spoke against this because it will be written into contracts by consultants. It will become a de facto standard, and some existing cabling method that has been used for years will come under attack.

Javid Butler spoke in support of the standard, saying that we can fix it to remove the contentious issue of dual-pair versus single-pair, and that the standard can provide guidance for those who do not have their preferred topology.

Kimberly Corbett argued that a flat out rejection of the comment is not appropriate, that perhaps we should try to address the concerns expressed in Dan Antonuk's support for his recommendation that the standard be abandoned.

Ted Paget argued that we could vote against the motion to reject the comment and then respond to the comment in some other way.

Tracy Underhill reminded people of the tremendous investment that Javid Butler put into the project. Rejecting it off-handedly is not fair to Butler. He also argued for requiring the wiring of two pairs; to abandon that now would be to make it impossible for any products to be developed that use the second pair.

Eddie Kramer spoke in favor of having a standard for building cabling. He does not like moving a show into a building and not knowing what the cabling in the building is. Then, he runs his own cable, thus defeating the purpose of having installed cable.

Bob Goddard said that Adam Bennette's book is not the appropriate place for the information we agree is good in the E1.27-2 document. It is supposed to be an end-user's guide, and the end-user is not the person to be wiring a building.

The motion was modified to "We continue with the project of developing a permanent cabling document." The seconder agreed. By show of hands 11 in favor, two against, four abstentions. Ergo, the project continues.

Peter Willis moved that we direct the task group to remove the requirement mandating the wiring of pins four and five. The motion was seconded. By a show of hands, 12 voted in favor, one against, and the rest abstained. This was a simple majority.

Ted Paget moved that the permanent cabling document take the form of a recommended practice rather than a standard and that the method of publishing the recommended practice be determined at a later date. The motion was seconded.

Javid Butler moved that action on the motion be deferred until the next meeting. The motion was seconded. By show of hands, 16 voted in favor, none against, and the rest abstained. Action was deferred until the next meeting.

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

There was a motion made at the last meeting for a public review of some EPIs, but where are the EPIs that are the subject of that motion?

There was no report.

8.8 BSR E1.31, Lightweight streaming protocol for transport of DMX512 using ACN

Progress report on drafting resolutions for the working group to consider. See the summary of comments, E1-31FrstRvwCmmntSmmry.pdf

Rob Tooker said that there were three items that were contentious and about which the task group would like some discussion in the working group:

(1) Universe arbitration is a bone of contention. The task group has discussed changing it to "source control." The problem is that a receiver could get control information from several sources. There is a need to rank the sources in priority, to indicate what is a primary source or a secondary source, or what a receiver should do. The existing document has a four-byte field that says what has to be done when there are multiple sources, by pointing to an EPI that still needs to be written. The proposed document simply provides a numerical ranking, and the receiver can do with the ranking however the manufacturer decides it should.

Goddard said that he wanted some kind of mandated default behavior. A mandated default was explained by Peter Willis.

Rob Tooker moved that the working group direct the task group to use a two-byte field for source control, which would give a receiver a numerical ranking of source precedence when multiple sources are present. The interpretation of the ranking and the resulting receiver behavior would be defined by the receiver manufacturer. The motion was seconded and then approved with a show of hands with 14 voting in favor, and the rest abstaining. (Steve Terry had left the meeting by this time to return to the ESTA Board meeting.)

Bob Goddard moved that the procedure described in the previous motion passed shall replace the procedure described in the existing clause 6.4 of the draft E1.31 document (clause 6.2.3 of the last public review document). The motion was seconded and then approved with a unanimous show of hands, including the chairman.

(2) Shall RDM be included in E1.31, thus effectively merging the E1.33 project into the E1.31 project?

Roger Lattin moved that the E1.31 and E1.33 projects be merged. The motion was seconded and then approved with a unanimous show of hands (including the chairman).

Dave Higgins offered the services of his employee Kevin Loewen to work on the combined project with Scott Blair.

The consensus of the group was that the E1.33 project should not be withdrawn yet, but that it may be at some future time. The RDM part might have to be backed out of E1.31 and published as E1.33. No motion was made to maintain the E1.33 project, but no motion was made to withdraw it, so it remains.

(3) Name of the standard

Scott Blair suggested that we need to come up a different name. It is not "Streaming ACN." It was pointed out that the name filed with ANSI on the PINS form was not "Streaming ACN," but "Lightweight streaming protocol for transport of DMX512 using ACN."

A motion was made to call the document "Lightweight streaming protocol for transport of DMX512 and RDM using ACN" was suggested. The motion failed for lack of a second. The consensus was that the task group should simply put the title that was filed with ANSI on the PINS on the document, and Karl Ruling should make sure that the minutes and the agenda use this name.

8.9 BSR E1.33-200x, Extensions to E1.31 for Transport of ANSI E1.20 (RDM) Progress report. [Charles Reese]

Charles Reese was not present and there was no report.

8.10 BSR E1.37-200x—Additional Message Sets for ANSI E1.20, Remote Device Management
Progress report. [Blair]

No news

9 New business

None.

10 Other business

None.

11 Schedule for future meetings

Tracy Underhill announced in an East Texas accent that the next meeting is scheduled for Thursday, 20 March 2008, from 09:00 to 13:00 at the Hilton Americas in Houston, Texas.

12 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:

None

13 Adjournment

Ted Paget moved that the meeting adjourn. The motion was seconded and then approved with a unanimous show of hands. Tracy Underhill declared the meeting adjourned at 17:11.

Working Group Membership and Contact Information as of 15 February 2008

Name	Company	Representing (This is the sort field.)	Voting status	Int. Cat.
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
Andre Broucke	ADB - TTV Technologies	ADB-TTV Group	O	MP
John Sellers	AIM Northwest	AIM Northwest	O	G
Arnold Tang	Arnold Tang Productions	Arnold Tang Productions	O	U
Wayne David Howell	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	P	CP
Simon Hobday	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	A	CP
Steve Friedlander	Auerbach Pollock Friedlander	Auerbach Pollock Friedlander	O	U
J. B. Toby	Avolites Ltd.	Avolites Ltd.	O	MP
Richard Salzedo	Avolites Ltd.	Avolites Ltd.	O	MP
Shahid Anwar	Avolites Ltd.	Avolites Ltd.	O	MP
Barbara Wohlsen	Barbara Wohlsen	Barbara Wohlsen	O	U
Tobin Neis	Barbizon Companies	Barbizon Companies	O	DR
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
Steve Roberts	Carr & Angier	Carr & Angier	O	G
Bob Toms	Catalyst Microsystems LLC	Catalyst Microsystems LLC	O	G
Marty Lazarus	Chicago Spotlight, Inc.	Chicago Spotlight, Inc.	O	G
Chuck Seifried	Phoenix Civic Plaza	City of Phoenix	O	U
Larry Dunn	City Theatrical, Inc.	City Theatrical, Inc.	O	CP
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
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	DIN, NVBF Committee	P	U
Doug Fleenor	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Ken Wagner	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Gary Dove	Dove Systems	Dove Systems	O	MP
Jerry Durand	Durand Interstellar, Inc.	Durand Interstellar, Inc.	O	CP
Dirk Beiner	e:cue GmbH & Co. KG	e:cue GmbH & Co. KG	O	MP
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
Bill Fehrmann	Electrol Engineering, Inc.	Electrol Engineering, Inc.	O	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Adam Bennette	Electronic Theatre Controls Ltd.	Electronic Theatre Controls, Inc.	O	MP
Anders Ekvall	Transtechnik Lichtsysteme GmbH	Electronic Theatre Controls, Inc.	O	MP
Hans Leiter	ETC GmbH	Electronic Theatre Controls, Inc.	O	MP
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Tracy Underhill	Electronics Diversified LLC	Electronics Diversified LLC	P	MP
Ralph Weber	ENDL Texas	ENDL Texas	O	G
Philip Nye	Engineering Arts	Engineering Arts	P	G
Eric Johnson	Eric Johnson	Eric Johnson	O	MP
Erwin Rol	Erwin Rol Software Engineering	Erwin Rol	O	G
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
Sierk Janszen	Ground Zero	Ground Zero	O	U
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	O	MP
Bill Hewlett	Hewlett Electronics	Hewlett Electronics	O	CP
Scott M. Blair	High End Systems Inc.	High End Systems Inc.	P	MP
Tom Grimes	High End Systems, Inc.	High End Systems, Inc.	A	MP
Steve Carlson	High Speed Design, Inc.	High Speed Design, Inc.	O	MP
Alan Martello	Horizon Control Inc.	Horizon Control Inc.	P	MP

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Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
Paul J. Clark	HxDx	HxDx	O	CP
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	P	U
Alan M. Rowe	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Dennis Grow	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Gian Carlo C. Bartolotti	Ibeam SP / Banco de Eventos	Ibeam SP / Banco de Eventos	O	U
Geoffrey O. Thompson	Nortel Networks, Inc.	IEEE 802.3/Nortel Networks	O	G
John (Javid) D. Butler	Integrated Theatre, Inc.	Integrated Theatre, Inc.	P	CP
Michael (Mike) Whetstone	Integrated Theatre, Inc.	Integrated Theatre, Inc.	A	CP
Rob Johnston	Interactive Technologies, Inc.	Interactive Technologies, Inc.	O	MP
David Timmins	Jands Electronics	Jands Electronics	O	MP
Helge Hoffmann	JB Lighting	JB Lighting	O	MP
Christopher Purpura	Jones & Phillips Associates, Inc.	Jones & Phillips Associates, Inc.	O	G
Josh Gubler	Josh Gubler	Josh Gubler	O	CP
Lawrence Neal	Lawrence Neal	Lawrence Neal	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	Colortran	Leviton Manufacturing Co., Inc.	P	MP
Ken Vannice	Colortran	Leviton Manufacturing Co., Inc.	A	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	P
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
Bart Swinnen	Luminex LCE	Luminex LCE	O	MP
Jim Holladay	Luxence	Luxence	O	G
Daniel Weiermann	Mainstage Theatrical Supply - Milwaukee	Mainstage Theatrical Supply	O	DR
Flemming Jensen	Martin Professional A/S	Martin Professional A/S	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
Kevin Loewen	Pathway Connectivity Inc.	Pathway Connectivity Inc.	P	MP
Dave Higgins	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	MP
Ron Bonner	PLASA	PLASA	P	G
James Eade	PLASA	PLASA	O	G
Mac Perkins	PNTA Inc.	PNTA Inc.	O	G
Charles Reese	Production Resource Group	Production Resource Group	P	DR
Robert Tooker	Production Resource Group	Production Resource Group	A	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
Sean Harding	Rhode Island College	Rhode Island College	O	U
Charlie Richmond	Richmond Sound Design Ltd.	Richmond Sound Design Ltd.	O	CP
Martin Farnik	Robe Show Lighting s.r.o.	Robe Show Lighting s.r.o.	O	MP
Michael Lay	Strand Lighting	Royal Philips Electronics	P	MP
Hans Lau	Sand Network Systems, Inc.	Sand Network Systems, Inc.	P	MP
Yngve Sandboe	Sand Network Systems, Inc.	Sand Network Systems, Inc.	A	MP
Kimberly Corbett	Schuler Shook	Schuler Shook	P	G
Mick Martin	ShowCAD Control Systems	ShowCAD Control Systems	O	MP
Loren Wilton	Showman Systems	Showman Systems	O	CP
Mark Manthei	Shure Inc.	Shure Inc.	P	G
Kehang Wu	Shure Inc.	Shure Inc.	O	G
Jon R. Farley	Sixteenth Avenue Systems	Sixteenth Avenue Systems	O	CP
Robert Barbagallo	Solotech Inc.	Solotech Inc.	O	U

Name	Company	Representing (This is the sort field.)	Voting status	Int. Cat.
Michael Gonzales	Spectrum Lighting Inc.	Spectrum Lighting Inc.	O	DR
Ujjal Kar	Standard Robotics & Lighting	Standard Robotics & Lighting	O	G
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
Pete Baselici	The Watt Stopper	The Watt Stopper	O	MP
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	O	G
Colin Waters	TMB	TMB	O	U
Mitch Hefter	Entertainment Technology (Royal Philips Electronics)	USITT	P	U
Torrey Bievenour	Vision Quest Lighting	Vision Quest Lighting	O	G
Eckart Steffens	SOUNDLIGHT	VPLT	O	G
Eric Cornwell	West Side Systems	West Side Systems	O	U
John Sondericker III	Wybron, Inc.	Wybron, Inc.	O	MP
Paul Kenneth McEwan	Zero 88 Lighting Limited	Zero 88 Lighting Ltd.	O	MP

Key to codes:

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|---|--------------------------|----|--|
| P | principal voting member | MP | mass-market producer interest category |
| A | alternate voting member | CP | custom-market producer interest category |
| I | individual voting member | DR | dealer or rental company interest category |
| O | observer, non-voting | U | user interest category |
| | | G | general-interest interest category |