

**Minutes**  
**Control Protocols Working Group**  
Saturday, 20 January 2001  
Dallas/Ft. Worth Airport Marriott, Irving, TX

**Chair:** Steve Carlson; High Speed Design, Inc.; principal; producer

**Recording secretary:** Karl G. Ruling, ESTA

**Members attending:** Wayne David Howell; Artistic Licence (UK) Ltd.; principal; producer  
Doug Fleenor; Doug Fleenor Design, Inc.; principal; producer  
Milton Davis; Doug Fleenor Design, Inc.; alternate; producer (joined with this new affiliation at this meeting)  
Ed Jones; Edwin Jones Co., Inc.; principal; producer  
Greg Heinzle; Electronic Theatre Controls, Inc.; principal; producer  
Tracy Underhill; Electronics Diversified Inc.; principal; producer  
Philip Nye; Engineering Arts; principal; general interest  
Scott Blair; High End Systems Inc.; principal; producer  
Peter Willis; Howard Eaton Lighting Ltd.; principal; producer (joined with this new affiliation at this meeting)  
Roger Lattin; IATSE Local 728; Observer; user  
Edwin S. Kramer; IATSE, Local 1; principal; user  
Edward (Ted) Paget; Jones & Phillips Associates, Inc.; principal; general interest  
Ken Vannice; Leviton Manufacturing Co., Inc. (NSI Corporation); alternate; producer  
Ole Pedersen; Martin Professional A/S; principal; producer  
Dave Higgins; Pathway Connectivity Inc.; principal; producer  
George Kindler; PRG (Thoughtful Designs); alternate; user  
Steve Unwin; Pulsar Ltd.; alternate; producer  
Jon R. Farley; Rosco Laboratories (Rosco/Entertainment Technology); principal; producer  
Richard Lawrence; Strand Lighting Ltd.; principal; producer  
Jerry Gorrell; Theatre Safety Programs; principal; general interest  
Brian Dowd; TMB Associates; principal; user  
Mitch Hefter; USITT (Rosco/Entertainment Technology); principal; user  
Charles Reese; Vari-Lite, Inc.; principal; producer  
Richard Thornton Brown; Zero 88 Ltd.; principal; producer

**Visitors:** Louis Bradfield, Bally's Las Vegas

**Regrets:** Steve Terry and Trevor Forrest sent their regrets for not being able to attend.

**1 Opening remarks**

Steve Carlson called the meeting to order at 09:01. Carlson welcomed everyone and said that Steve Terry sends his regrets that he is unable to attend. Carlson pointed out that we have a sign-in sheet for taking attendance and asked Karl Ruling to describe how to fill it out, which Ruling did.

**2 Attendance and membership**

**2.1 Introductions of those present**

Carlson asked those present to introduce themselves, which they did, starting with Ruling, who was seated on Carlson's right.

**2.2 Determination of quorum (11 needed, 16 for a supermajority)**

Carlson announced that we have a quorum.

### 2.3 Recognition of alternate voting members

Carlson asked that alternates who will be voting to identify themselves. George Kindler said he would be voting for PRG. Ken Vannice said he would be voting for Leviton. Steve Unwin said that he would be voting for Pulsar.

### 2.4 Requirements for membership

Carlson asked Ruling to explain the requirements for membership. Ruling explained that membership is open to all who are affected by the work of the group, but that voting membership is restricted to those who can attend meetings regularly and who will respond to letter ballots. Missing three letter ballots in a row is grounds for having voting status changed to observer. Observers have the same rights as voting members to see the working group's documents and to debate, but may not vote.

### 2.5 Processing of new membership requests

Carlson announced that we have applications from Peter Willis, who is applying to represent Howard Eaton Lighting as a principal in the producer interest class (he had been an observer for Andera), from Milton Davis, who is applying to represent Doug Fleenor Design as an alternate in the producer interest class (he had been an alternate for Strand Lighting), and from Eric Cornwell, owner of West Side Systems, who was applying as an observer.

Carlson asked what is the will of the group, and the applications were approved by acclamation.

The voting body for this meeting was thus:

Name	Representing (company, if different)	Voting status	Interest category
John Sellers	AIM Northwest	principal	gen. interest
Tony de Rijk	Amazing Controls! Inc.	principal	producer
Wayne David Howell	Artistic Licence (UK) Ltd.	principal	producer
Tobin Neis	Barbizon Companies	principal	user
Doug Fleenor	Doug Fleenor Design, Inc.	principal	producer
Milton Davis	Doug Fleenor Design, Inc.	alternate	producer
Ed Jones	Edwin Jones Co., Inc.	principal	producer
Greg Heinze	Electronic Theatre Controls, Inc.	principal	producer
Ed Prasser	Electronic Theatre Controls, Inc.	alternate	producer
Tracy Underhill	Electronics Diversified Inc.	principal	producer
Scott Rempel	Electronics Diversified Inc.	alternate	producer
Philip Nye	Engineering Arts	principal	gen. interest
Robert Goddard	Goddard Design Co.	principal	producer
Dexter McNeil	Goddard Design Co.	alternate	producer
Trevor Forrest	Helvar Lighting Control	principal	producer
Scott Blair	High End Systems Inc.	principal	producer
Steve Carlson	High Speed Design, Inc.	principal	producer
Peter Willis	Howard Eaton Lighting Ltd.	principal	producer
Edwin S. Kramer	I.A.T.S.E. Local 1	principal	user
John Huntington	I.A.T.S.E. Local 1	alternate	user
Edward Paget	Jones & Phillips Associates, Inc.	principal	gen. interest
Rick Leinen	Leviton Manufacturing Co., Inc. (NSI Corporation)	principal	producer
Ken Vannice	Leviton Manufacturing Co., Inc. (NSI Corporation)	alternate	producer
Ole Pedersen	Martin Professional A/S	principal	producer
Dave Higgins	Pathway Connectivity Inc.	principal	producer
Michael (Sandy) Twose	Pathway Connectivity Inc.	alternate	producer
Tim Cox	PLASA	principal	gen. interest
Tony Douglas-Beveridge	PLASA	alternate	gen. interest
Steve Terry	PRG (Fourth Phase New Jersey)	principal	user
George Sabbi	PRG (PRG Lighting and Audio Group)	alternate	user
George Kindler	PRG (Thoughtful Designs)	alternate	user
Robert Barbagallo	Proximo Inc.	principal	user
Paul F. Mardon	Pulsar Ltd.	principal	producer
Steve Unwin	Pulsar Ltd.	alternate	producer
Jon R. Farley	Rosco Laboratories (Rosco/Entertainment Technology)	principal	producer
David George	Spectrum Manufacturing Inc.	principal	producer
Richard Lawrence	Strand Lighting Ltd.	principal	producer

Name	Representing (company, if different)	Voting status	Interest category
Jerry Gorrell	Theatre Safety Programs	principal	gen. interest
Brian Dowd	TMB Associates	principal	user
Mitch Hefter	USITT (Rosco/Entertainment Technology)	principal	user
Charles Reese	Vari-Lite, Inc.	principal	producer
Eckart Steffens	VPLT (SOUNDLIGHT)	principal	gen. interest
Richard Thornton Brown	Zero 88 Ltd.	principal	producer
Peter Brooks	Zero 88 Ltd.	alternate	producer
		32 voting members	20 producers 6 users 6 gen. interest

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

Ted (Edward) Paget moved that the minutes be approved as written. The motion was seconded. There was no discussion offered and the motion was accepted unanimously with a voice vote.

### 4 Call for patents

Steve Carlson read the call for patents:

"ESTA intends to publish no standard that contains protected intellectual property, unless that property can be licensed by anyone for a reasonable fee. ESTA uses a process of open patent disclosure to implement this intent. ESTA does not conduct patent searches and does not warrant that its standards contain no protected intellectual property.

"In keeping with the open disclosure policy, I ask if anyone present wishes to notify the working group of the existence of a patent or copyright that might protect material in a standard being developed by the working group. You need not be the holder of the patent or copyright in order to notify the working group of its existence."

No issues were identified at this time by any members of the working group Carlson asked if there were any questions. There were no questions.

#### and Anti-Trust Statement

Carlson also read the anti-trust statement:

"The ESTA Board of Directors, the Technical Standards Committee, and the leadership of this Working Group will reject or nullify any actions that restrain trade. Anyone who feels that an action restraining trade is being or has been taken is requested to bring the 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 any member of this working group may be found individually liable for any action that restrains trade taken by this working group. An individual convicted of a violation of the Sherman Act may be fined as much as \$100,000 and be imprisoned for up to three years. An easy to read pamphlet describing restraint of trade is available from the Technical Standards Committee."

Again, no issues were brought to the attention of the working group. Carlson directed people to read the pamphlet or to talk to Karl Ruling if they have any questions.

### 5 Approval of agenda

Carlson noted that he had been scheduled to do a DTE power tutorial, but that this wasn't possible because his committee's editor had been sick for three weeks. Instead, he will give an overview as item 7.1. Carlson also said that he wants to discuss how we start and run projects here to make them more efficient. This item would be 7.2 under new business.

Ted Paget moved that we accept these changes to the agenda. The motion was seconded. The amended agenda was accepted unanimously with a show of hands.

### 6 Old business

#### 6.1 E1.3 Guide

Ruling asked that the working group either continue working on the E1.3 application guide document, or that it be approved for publication.

Mitch Hefter moved that the E1.3 application guide (CP/199-1008r3) should be published, and that this recommendation be forwarded to the TSC. The motion was seconded. John Farley pointed out that information about pin 15 of the 15-pin Cinch Jones connector was missing. Karl Ruling added this missing information, and created (CP/1999-1008r4). Hefter modified his motion so that that the E1.3 application guide (CP/199-1008r4) should be published, and that this recommendation be forwarded to the TSC. His modified motion was acceptable to the seconder.

By roll call:

Name	Company	Voting status	Int. category	Vote
Wayne David Howell	Artistic Licence (UK) Ltd.	P	P	accept
Doug Fleenor	Doug Fleenor Design, Inc.	P	P	accept
Ed Jones	Edwin Jones Co., Inc.	P	P	accept
Greg Heinzle	Electronic Theatre Controls, Inc.	P	P	accept
Tracy Underhill	Electronics Diversified Inc.	P	P	accept
Phillip Nye	Engineering Arts	P	G	accept
Scott Blair	High End Systems Inc.	P	P	accept
Steve Carlson	High Speed Design, Inc.	P	P	accept
Peter Willis	Howard Eaton Lighting Ltd.	P	P	accept
Edwin S. Kramer	I.A.T.S.E. Local 1	P	U	accept
Edward Paget	Jones & Phillips Associates, Inc.	P	G	accept
Ken Vannice	Leviton Manufacturing Co., Inc. (NSI Corporation)	A	P	accept
Ole Pedersen	Martin Professional A/S	P	P	accept
Dave Higgins	Pathway Connectivity Inc.	P	P	accept
George Kindler	PRG (Thoughtful Designs)	A	U	accept
Steve Unwin	Pulsar Ltd.	A	P	accept
Jon R. Farley	Rosco Laboratories (Rosco/Entertainment Technology)	P	P	accept
Richard Lawrence	Strand Lighting Ltd.	P	P	accept
Jerry Gorrell	Theatre Safety Programs	P	G	accept
Brian Dowd	TMB Associates	P	U	accept
Mitch Hefter	USITT (Rosco Entertainment Technology)	P	U	accept
Charles Reese	Vari-Lite, Inc.	P	P	accept
Richard Thornton Brown	Zero 88 Ltd.	P	P	accept
Total				23 accept None against

The motion carried with a supermajority

## 6.2 E1.11

### 6.2.1 Public review progress report

Ruling reported that the TSC had accepted the motion to send BSR E1.11 to public review. The ANSI Standards Action publication calendar is such that the comment period will close April 24.

There was a discussion of the health of the ESTA website, which was suffering from an unreliable connection to the Internet. It was resolved that the documents will be put on both the USITT and ESTA websites.

### 6.2.2 E1.11 Task group report

Mitch Hefter reminded the working group that our first public review document could be the IEC committee draft document. He explained the IEC process and its timetable for public comment and committee voting.

Hefter asked for a motion to let the IEC use our public review document as their input document. There was a discussion of the risks involved with offering this document to the IEC as an input document. The idea was put forth that the document will be more solid if we wait for the results of this public review before the document goes to the IEC.

Doug Fleenor moved that we wait for the comments to come back from this public review before we send the document to the IEC. The motion was seconded by Wayne Howell. By show of hands: 21 in favor, none opposed, two abstain (this includes the Chair). The motion carried.

Hefter reported that the task group has a number of projects for the next phase of development of E1.11. [More on that later in the meeting.]

### **6.2.3 Cat 5 report**

The progress of the Cat 5 project was reported on by Mitch Hefter. Hefter said that he had found some inconsistencies in the supporting data reports. He feels the need to make changes he calls editorial but said they are great enough in number that he feels the working group may want to look at the document again. Hefter asked the will of the working group, do they want to see and pass on the Cat 5 report before it is published? The consensus of the group was that it should not be published until the complete report is ready for the group to look at again.

### **6.3 ACN Task Group report**

Steve Carlson reported that there were procedural issues that had to be clarified and these were at LDI. There had been concerns about the level of interaction needed with the Internet Engineering Task Force (IETF) and the Internet Assigned Numbers Authority, and those concerns were addressed.

Mitch Hefter moved the ACN "study group" become an American National Standard project. The motion was seconded. There was an extended discussion. Hefter moved to call the previous question. This motion was seconded. The motion was accepted unanimously, cutting off further debate. By show of hands, there were Unanimous. By show of hands: 22 in favor of making ACN an American National Standard project, none opposed, one abstain. The motion carried.

## **7 New business**

### **7.1 DTE power overview update**

Carlson reported that the DTE power task force's comment period is still open so the total number of comments that will need to be resolved is still undetermined. Mike McCormick, the document's editor has been in the hospital for weeks with pneumonia, which has slowed things. However, many comments are possible and even probable. For example, the 10Gig Ethernet committee had 1,400 comments from just 22 commentors.

The DTE power task force is working on draft 1.1. The nominal voltage about 48 volts (42 to 57V) and the current supply is 350ma continuous and 500 ma for 100millisecond at start up. The scheme can deliver almost 13W at the end of a 100m link. Six watts is enough for a phone system, but if you need a backlit screen at a terminal, 13W is better. Two methods of power distribution are being used: power over signal pairs and power over unused pairs.

The group has voted to support gigabit Ethernet. They did the math and it can be done. 100baseT is the weakest protocol on the market now. 10baseT is very robust. Gigabit is also quite robust because the 802.3 committee learned from the 100baseT problems.

Carlson reported that wireless LANs are taking off at a great rate. It's better to have the transceivers up near the ceiling, so power over Ethernet will be a great thing; you don't have to get mains power (120V or 240V) up to the ceiling.

Carlson reported that a call for interest had been published for a study group initially called "Ethernet in the Last Mile" but now called "Ethernet in the First Mile." The study group would investigate using regular telephone lines for carrying full Ethernet frames for about a kilometer. Carlson arguing for 10Mbit full-Ethernet, full-duplex. The protocol (equipment and data format, et cetera) will have to be robust enough to deal with the atmospheric discharges to which telephone lines are susceptible.

### **7.2 How we start and run projects**

Carlson presented his views on how we start and run projects and used the BSR E1.11 project as an example. He feels that we do not have enough process in place to clarify objectives early, so the task group spun wheels chasing objectives that were moving targets. Carlson wants to use the following process:

1. Someone has a possible project: standard, RP, technical report, etc
2. He/she presents the proposal to the group. The proposal should be published in advance.
3. The working group can "take its temperature" (see if there is support in the group). There needs to be more than one person to work on a project to move it forward. Carlson noted that interest by only one person means support of less than 1% of the group, if the total working group membership is considered.
4. If it's a standards track project, it needs a study group to come up with a list of objectives. The working group can then massage that to come up to an agreed upon set of objectives.
5. If it's a recommended practice, we follow essentially the same thing, but with a list of objectives that are consistent with a recommended practice.

Carlson's proposal was favorably received.

## **8 Other business**

**8.1** Hefter reported that the E1.11 task group has four more projects it wants to work on:

1. An RP for E1.11, applications notes
2. DC power on DMX cable. This would be a different document
3. A PICS for DMX
4. Polled talkback

**8.2** Peter Willis asked about people from the UK being able to represent multiple groups. This was discussed. Ruling explained that no one can carry a proxy or vote for multiple companies, however, it is possible for a person's vote to be entered ahead of time if submitted in writing. Ruling also noted that it is possible for someone to be an alternate for another company. However, in the latter case, the person may only cast one vote; he/she cannot vote for two companies at one meeting.

**8.3** Peter Willis requested that regrets be put in the minutes. Ruling said he would do so.

**8.4** Willis raised the issue of some people failing to vote. This led to a discussion of abstentions and possible changes to the P&P to specifically allow abstentions. There was a discussion of the possible types of abstentions. There was also a discussion of how deliberations can be managed if not all are experts on the subject at hand.

**8.5** Ruling distributed a letter from Lori Rubinstein, ESTA's Executive Director, explaining the importance of working group members booking their hotel room for these Irving meetings through ESTA. Ruling verbally emphasized some of the points.

**RECESS** Carlson announced that the meeting would recess and reconvene at 16:00 to act on any motions brought to it by the task groups that would meet that afternoon. The meeting was recessed at 11:47

**RECONVENE** Carlson reconvened the meeting at 16:00. Twenty-one voting members were present.

**8.6** The E1.11 task group presented its four proposals for projects:

**8.6.1** DMX512-A Recommended Practice presentation:

DMX512-A Recommended Practice – Why?

Intended to replace the existing RP.

Prime audience is the end-user, with section devoted to manufacturers for design.

Vehicle for publishing much of the existing guidance information removed from early drafts of the new standard.

General how-to information.

Interfacing to legacy products.

The ROP stated that there would be a recommended practice to follow.

DMX512-A Recommended Practice – What?

End-user section – Installers, specifiers, and users

- Brief history
- Troubleshooting and test equipment
- Explains what's new.
- Guidance for system implementation.
- System topologies.
- Cabling rules.

Product design section – Manufacturers

- Equipment topologies.
- Component selection.
- Sample Circuit designs.
- Protection regulations.

Official FAQ

DMX512-A Recommended Practice – How?

ESTA, PLASA, USITT, VPLT, APIAS (not ANSI) Recommended Practice

DMX512-A Recommended Practice – Who?

Roger Lattin, Peter Willis, Mitch Hefter, Richard Brown, Scott Blair, Wayne Howell, and Adam Bennette (if willing)

Peter Willis moved that we move forward with the above outlined DMX512-A Recommended Practice project. The motion was seconded. Ted Paget moved that "and the first step shall be the drafting of a set of specific objectives" be added to the motion, making it "that we move forward with the above outlined DMX512-A Recommended Practice project, and that the first step shall be the drafting of a set of specific objectives." The motion to amend the motion was seconded. The friendly amendments were accepted by the principal motion maker and seconder. By show of hands: 20 in favor, none opposed, and only the Chair abstained.

Ruling was directed by the Chair to announce this project when we have a firm set of objectives.

**8.6.1** The Accessory Power project was presented:

Accessory Power : "A nominal 24 VDC Supply used to power the electronics and control/drive functions of a product which does not then require connection to mains voltage. Frequently known as scroller power but not in fact restricted to use with scrollers."

Accessory Power – Why?

There are devices on the market that use DMX512 data directly but that require power.

- Color scrollers
- Gobo rotators
- LED fixtures
- Moving mirror heads

There are many manufacturers of these devices, e.g.

- Wybron
- City Theatrical
- Christie Lites (Sic. Company now called Spectrum Manufacturing.)
- Rosco
- Artistic Licence
- AC Lighting
- American DJ
- Rainbow
- Color Kinetics
- Howard Eaton Lighting
- GAM

Interconnectivity would serve:

- End-users
- Rental houses

Specifiers  
Manufacturers (in general)  
Wide review of specifications will:  
Improve technical accuracy  
Identify appropriate use:  
Increase protection and awareness against shorts, cross-wiring non-standard equipment, environmental damage.

Accessory Power – What?

The Accessory Power project attempts to standardize the practice of placing DMX512 signals and nominal 24V DC Power on the same connector. I.e.:

What connector (not 5-pin XLR!), sex, pin-outs

Voltage limits

Current limits

Cable and wiring

Accessory Power – How?

American National Standard

Draft by July ESTA meeting

Accessory Power – Who?

Current TG members

Doug Fleenor, Peter Willis

Identify additional players:

Manufacturers / Rental Houses

Interested parties

Invite participation

Announce standard development

Direct mail/phone call to players.

Ted Paget moved that CPWG authorize the E1.11 task group to form a study group for the accessory power project to identify possible participants and to develop a set of objectives. The motion was seconded. By show of hands: 20 in favor, none opposed, only the Chair abstained. The motion carried.

### 8.6.3 DMX512-A PICS

DMX512-A PICS – Why?

Technical and market demand issues.

Internal checking of the consistency of the standard.

End-user verification of options (annexes).

DMX512-A PICS – What?

Checklist for Manufacturer and users to verify product compliance with the standard.

DMX512-A PICS – How?

White paper

DMX512-A PICS – Who?

Karl Ruling, Ted Paget, Tim Cox?, Tony Douglas-Beveridge?

Phillip Nye moved that a project be initiated to produce a white paper PICS. The motion was seconded. By show of hands: 20 in favor, none opposed, only the Chair abstained. The motion carried.

Ruling was directed by Steve Carlson to contact ANSI and ask about whether a PICS as an informative annex is okay.



#### 8.6.4 Polled talkback presented:

##### Polled talkback – Why?

Allows end-user to remotely access device parameters such as:

Remotely setting DMX addresses

Access to error messages and status reporting

Setting/Accessing any other “well-known” device parameters.

Extends functionality of ACN to existing DMX based products.

Many existing DMX products can be upgraded to add new functionality and value.

##### Polled talkback – What?

Method of providing talkback on existing full or half-duplex systems.

Based on polled device discovery using a system of unique numbers (internal device ID's).

Using alternate START Codes and follows existing DMX standard.

##### Polled talkback – How?

American National Standard

##### Polled talkback – Who?

Ole Pedersen, Wayne Howell, Scott Blair, Bob Goddard, Tracy Underhill, Dave Higgins

##### Polled talkback – Issues/Obstacles

There is an existing patent that covers its use in certain products (moving lights).

Dave Higgins moved that a study group be formed to investigate the feasibility of producing an American National Standard for polled talkback on DMX, and that the first order of business shall be the creation of a set of objectives for the project. The motion was seconded. There was an extended discussion on polled talkback. Wayne Howell moved the previous motion. This motion was seconded. The motion was carried with more than 2/3rds voting in favor. Higgins' motion to form a study group was accepted by a show of hands with 19 in favor, one opposed, and only the Chair abstaining.

## 9 Schedule for future meetings

Carlson announced that the next meeting is scheduled for from 9:00 in the morning to 6:00 at night on March 22 at the Westin Hotel in Long Beach, CA. The meeting is being held in conjunction with the USITT Conference and Stage Expo.

The full meeting schedule is as follows. Locations are at the Westin Hotel, except as noted:

ACN Task Group: Saturday, 24 March 2001, 09:00 - 18:00

Sunday, 25 March 2001, 09:00 - 18:00

Camera Cranes: Monday, 20 March 2001, 14:00 - 18:00

Motion Picture Studio Grips Local 80

Burbank, CA

Control Protocols: Thursday, 22 March 2001, 09:00 -18:00

DMX Task Group: Thursday, 22 March 2001, 13:00 - 17:00

Sunday, 25 March 2001, 08:00 - 13:00

Electrical Power: Wednesday, 21 March 2001, 08:00 - 12:00

Floors: Friday, 23 March 2001, 13:00 - 17:00

Fog and Smoke : Friday, 23 March 2001, 19:00 - 23:00

Photometrics: Saturday, 24 March 2001, 13:00 - 17:00

Rigging: Wednesday, 21 March 2001, 19:00 - 23:00

Technical Standards Committee: Wednesday, 21 March 2001, 13:00 - 17:00

The summer meeting will be on July 14 at the Dallas/Ft. Worth Marriott.

**10 Adjourment**

Ted Paget moved that the meeting adjourn. The motion was seconded. The motion was accepted unanimously with a show of hands. Carlson declared the meeting adjourned at 17:42.

## Control Protocols Working Group Membership after the 20 January 2001 Meeting

Name	Company	Representing	Voting status	Int. cat.
John Sellers	AIM Northwest	AIM Northwest	P	G
Tony de Rijk	Amazing Controls! Inc.	Amazing Controls! Inc.	P	P
Wayne David Howell	Artistic Licence (UK) Ltd.	Artistic Licence (UK) Ltd.	P	P
Steve Friedlander	Auerbach & Associates, Inc.	Auerbach & Associates, Inc.	O	U
Sierk Janszen	Avenger Showcontrol	Avenger Showcontrol	O	P
J. B. Toby	Avolites Ltd.	Avolites Ltd.	O	P
Shahid Anwar	Avolites Ltd.	Avolites Ltd.	O	P
Richard Salzedo	Avolites Ltd.	Avolites Ltd.	O	P
Barbara Wohlsen	Barbara Wohlsen	Barbara Wohlsen	O	U
Tobin Neis	Barbizon Companies	Barbizon Companies	P	U
Bernardo Benito Rico	Ben-Ri Electronica S.A.	Ben-Ri Electronica S.A.	O	P
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
Bradley Klinkradt	Bradley Klinkradt	Bradley Klinkradt	O	G
Ted Fregon	Bytecraft Pty. Ltd.	Bytecraft Pty. Ltd.	O	P
Murray Mason	Bytecraft Pty. Ltd.	Bytecraft Pty. Ltd.	O	P
Bill Ellis	Candela Controls, Inc.	Candela Controls, Inc.	O	U
Marty Lazarus	Chicago Spotlight, Inc.	Chicago Spotlight, Inc.	O	G
Tal Miron	Compulite R & D	Compulite R & D	O	P
Jason Friedman	Creative Realities, Inc.	Creative Realities, Inc.	O	G
Mikael Fahl	Dataton AB	Dataton AB	O	P
David Bertenshaw	David Bertenshaw	David Bertenshaw	O	P
Doug Fleenor	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	P
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	P
Gary Dove	Dove Systems	Dove Systems	O	P
Jussi Kallioinen	Eastway Sound & Lighting	Eastway Sound & Lighting	O	U
Ed Jones	Edwin Jones Co., Inc.	Edwin Jones Co., Inc.	P	P
Bill Fehrmann	Electrol Engineering, Inc.	Electrol Engineering, Inc.	O	P
Greg Heinzle	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	P
Adam Bennette	Electronic Theatre Controls Ltd.	Electronic Theatre Controls, Inc.	O	P
Ed Prasser	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	P
Tracy Underhill	Electronics Diversified Inc. (Colorado)	Electronics Diversified Inc.	P	P
Paul Bennett	Electronics Diversified Inc.	Electronics Diversified Inc.	O	P
Scott Rempel	Electronics Diversified Inc.	Electronics Diversified Inc.	A	P
Philip Nye	Engineering Arts	Engineering Arts	P	G
Paul K. Ericson	Ericson Lighting Design	Ericson Lighting Design	O	U
Gerald Jones	Gerald Jones	Gerald Jones	O	U

Name	Company	Representing	Voting status	Int. cat.
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	P
Dexter McNeil	Goddard Design Co.	Goddard Design Co.	A	P
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	P	P
Scott Blair	High End Systems Inc.	High End Systems Inc.	P	P
Steve Carlson	High Speed Design, Inc.	High Speed Design, Inc.	P	P
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	P
Edwin S. Kramer	IATSE, Local 1	I.A.T.S.E. Local 1	P	U
John Huntington	IATSE Local 1	I.A.T.S.E. Local 1	A	U
Roger Lattin	IATSE Local 728	I.A.T.S.E. Local 728	O	U
Rob Johnston	Interactive Technologies, Inc.	Interactive Technologies, Inc.	O	P
Larry Schoeneman	Interesting Products, Inc.	Interesting Products, Inc.	O	G
David Timmins	Jands Electronics	Jands Electronics	O	P
Edward Paget	Jones & Phillips Associates, Inc.	Jones & Phillips Associates, Inc.	P	G
Merlin Milner	Leax Lighting Controls	Leax Lighting Controls	O	P
John Mehlretter	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	P
Mark T. Kraft	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	P
Rick Leinen	NSI Corporation	Leviton Manufacturing Co., Inc.	P	P
Ken Vannice	NSI Corporation	Leviton Manufacturing Co., Inc.	A	P
Andrew Sherar	Lightmoves PLC	Lightmoves PLC	O	P
Gary Pritchard	LSC Lighting Systems PTY Ltd	LSC Lighting Systems PTY Ltd	O	P
J. P. Steiner	Lutron Electronics	Lutron Electronics	O	P
Ole Pedersen	Martin Professional A/S	Martin Professional A/S	P	P
Tracy Schwenk	Martin Professional Inc.	Martin Professional A/S	O	P
Gerard Cohen	Martin Professional Inc.	Martin Professional A/S	O	P
Hiroshi Kita	Marumo Electric Co., Ltd.	Marumo Electric Co., Ltd.	O	P
Geoffrey O. Thompson	IEEE 802.3 / Nortel Networks	Nortel Networks	O	G
David A. Boller	Organic Machines LLC	Organic Machines LLC	O	P
William Benner	Pangolin Laser Systems	Pangolin Laser Systems	O	P
Dave Higgins	Pathway Connectivity Inc.	Pathway Connectivity Inc.	P	P
Michael (Sandy) Twose	Pathway Connectivity Inc.	Pathway Connectivity Inc.	A	P
Tim Cox	PLASA	PLASA	P	G
Tony Douglas-Beveridge	PLASA Standards Office	PLASA	A	G
Mac Perkins	PNTA	PNTA Inc.	O	G
Steve Terry	Fourth Phase New Jersey	PRG	P	U
George Sabbi	PRG Lighting and Audio Group	PRG	A	U
George Kindler	Thoughtful Designs	PRG	A	U

Name	Company	Representing	Voting status	Int. cat.
Robert Barbagallo	Proximo Inc.	Proximo Inc.	P	U
Paul F. Mardon	Pulsar Ltd.	Pulsar Ltd.	P	P
Steve Unwin	Pulsar Ltd.	Pulsar Ltd.	A	P
Stephen J. Tyrrell	Quantum Logic	Quantum Logic	O	P
Charlie Richmond	Richmond Sound Design Ltd.	Richmond Sound Design Ltd.	O	P
Jon R. Farley	Rosco/Entertainment Technology	Rosco Laboratories	P	P
Kenneth Mockler	Sceno Plus	Sceno Plus	O	U
Mick Martin	Showcad Control Systems	Showcad Control Systems	O	P
Andre Broucke	ADB - TTV Technologies	Siemens	O	P
David George	Spectrum Manufacturing Inc.	Spectrum Manufacturing Inc.	P	P
Ujall Kar	Standard Robotics & Lighting	Standard Robotics & Lighting	O	G
John Mitchell	Sterling Technical Services	Sterling Technical Services	O	U
Richard Lawrence	Strand Lighting Ltd.	Strand Lighting Ltd.	P	P
Tad Trylski	Tad Trylski	Tad Trylski	O	U
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	P	G
Thom Weaver	Thom Weaver	Thom Weaver	O	G
Brian Dowd	TMB Associates (NJ)	TMB Associates	P	U
Colin Waters	TMB Associates	TMB Associates	O	U
Hans Leiter	Transtechnik GmbH	Transtechnik GmbH	O	P
Anders Ekvall	Transtechnik GmbH	Transtechnik GmbH	O	P
Mitch Hefter	Rosco/Entertainment Technology	USITT	P	U
Charles Reese	Vari-Lite, Inc.	Vari-Lite, Inc.	P	P
Eckart Steffens	SOUNDLIGHT	VPLT	P	G
Ken Wagner	Walt Disney Imagineering	Walt Disney	O	U
Eric Cornwell	West Side Systems	West Side Systems	O	U
Keny Whitright	Wybron, Inc.	Wybron, Inc.	O	P
John Sondericker III	Wybron, Inc.	Wybron, Inc.	O	P
Richard Thornton Brown	Zero 88 Ltd.	Zero 88 Ltd.	P	P
Peter Brooks	Zero 88 Ltd.	Zero 88 Ltd.	A	P

#### Voting Status

- P Principal voting representative for a company or organization
- A Alternate voting representative for a company or organization
- I Individual representing no organization other than himself or herself
- O Observer, non-voting

#### Interest Categories

- P Producer (manufacturer) of control devices or products
- U User of control devices or products
- G General interest in control devices or products