

**Minutes**  
**Control Protocols Working Group**  
Thursday, 18 November 1999  
Peabody Hotel  
Orlando, FL

Chairman: Steve Carlson, Rosco/Entertainment Technology (Rosco Laboratories); Principal; User  
Steve Terry; PRG Lighting Division (PRG); Principal; User

Recording secretary: Karl G. Ruling; ESTA

Members attending: John Sellers; AIM Northwest; Principal; Gen. Interest  
Tony de Rijk; Amazing Controls! Inc.; Principal; Producer  
Peter Willis; Andera Ltd.; Principal; Producer  
Sierk Janszen; Avenger Showcontrol; Observer; Producer  
Shahid Anwar; Avolites Ltd.; Observer; Producer  
Tim Bachman; Barbizon Light (Barbizon Companies); Principal; User  
Bernardo Benito Rico; Ben-Ri Electronica S.A.; Observer; Producer (joined at this meeting)  
Lee J. Bloch; Bloch Design Group Inc.; Principal; Gen. Interest  
Soo-Myong Chung; Bloch Design Group Inc.; Alt.; Gen. Interest  
Tal Miron; Compulite R & D; Observer; Producer  
Doug Fleenor; Doug Fleenor Design, Inc.; Principal; Producer  
Gary Dove; Dove Systems; Observer; Producer  
Ed Jones; Edwin Jones Co.; Principal; Producer  
Greg Heinzle; Electronic Theatre Controls, Inc.; Alt.; Producer  
Scott Rempel; Electronics Diversified Inc.; Alt.; Producer  
Tracy Underhill; Electronics Diversified Inc.; Principal; Producer  
Philip Nye; Engineering Arts; Principal; Gen. Interest  
Robert Goddard; Goddard Design Co.; Principal; Producer  
Dave Higgins; Gray Interfaces; Principal; Producer  
Trevor Forrest; Helvar Lighting Control ; Principal; Producer  
Lary Cotten; High End Systems; Principal; Producer  
Scott Blair; High End Systems; Alt.; Producer  
John Huntington; IATSE Local 1; Alt.; User  
Rick Leinen; NSI Corporation (Leviton Manufacturing Co., Inc.); Principal; Producer  
Tim Cox; PLASA; PLASA; Principal; Gen. Interest  
Robert Barbagallo; Proximo Inc.; Principal; User  
Paul F. Mardon; Pulsar Ltd.; Principal; Producer  
Steve Unwin; Pulsar Ltd.; Alt.; Producer  
Richard Lawrence; Strand Lighting Ltd.; Principal; Producer  
Jerry Gorrell; Theatre Safety Programs; Theatre Safety Programs; Principal; Gen. Interest  
Brian Dowd; TMB Associates; Principal; User  
Mitch Hefter; Rosco/Entertainment Technology (USITT); Principal; User  
Eckart Steffens; SOUNDLIGHT (VPLT); Principal; Gen. Interest  
Peter Brooks; Zero 88 Ltd.; Zero 88 Ltd.; Principal; Producer

Visitors: Goffe Schiat; Avenger  
Franziskus Scharpff; KOBOLD-Produktion  
Bill Groener; Production Arts (PRG)

1 Opening Remarks

The meeting was called to order at 9:07 a.m. by Steve Carlson.

2 Attendance and membership

## 2.1 Introductions of those present

Those present introduced themselves, starting with the two chairs and proceeding counter-clockwise around the table.

## 2.2 Determination of quorum (10 needed)

Steve Terry announced to the crowd that a quorum obviously was present.

## 2.3 Recognition of alternate voting members

The chairs noted that Greg Heinzle will be voting for ETC. Ruling reminded the group that, while both principals and alternates may speak to an issue, only one may vote at a time.

## 2.4 Requirements for membership

The chairs asked Ruling to review the requirements for membership. Ruling noted that our P&P says that membership in a working group is open to all persons and organizations that are directly and materially affected by the actions of the working group. One does not need to be a member of ESTA to participate. There is no fee for participating, but voting members must be committed to attending working group meetings, and must pay their own expenses to attend.

## 2.5 Processing of new membership requests

Terry and Carlson read the names and company affiliations of the new applications for working group membership. The application for Paul Franklin of Glantre Engineering was removed from the stack and tabled by Steve Terry because Glantre has gone into receivership and is now being liquidated. It is not possible for a person to apply for membership representing a defunct company.

Mitch Hefter moved that the list of applicants be accepted. Tim Bachman seconded. The motion was approved by a unanimous show of hands. Thus, the following people were granted membership:

Bernardo Benito Rico; Ben-Ri Electronica; Observer; Producer  
Bill Ellis; Candela Controls, Inc.; Observer; Producer  
Gary Pritchard; LSC Lighting Systems Pty Ltd.; Observer; Producer  
John Huntington, IATSE Local 1; Alternate, User  
David George; Christie Lites Mfg. Ltd.; Principal; Producer  
Hiroshi Kita; Marumo Electric Co., Ltd.; Observer, Producer  
David Boller; Organic Machines LLC; Observer, Producer

## 3 Approval of the minutes from the previous meeting

Ed Jones moved that the minutes be approved as written. Eckart Steffens seconded the motion. Motion approved unanimously by show of hands.

## 4 Call for patents

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 patent issues were identified by any members of the assembled working group.

Carlson then 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, there was no mention of anti-trust concerns by anyone in the working group.

## 5 Approval of agenda

Carlson asked that the topics of 6.2 and 6.1 be swapped so that the DMX matters are addressed first, and that we add a 6.0 before 6.1 to discuss a request for comment in contrast to a public review.

John Sellers moved that the agenda be accepted with these changes. Lee Bloch seconded the motion. Unanimous approval by show of hands.

## 6 Old Business

### 6.0 Discussion of "Request for Comment" vs. "Public Review"

Carlson explained that there is a historical context for the term "public review". Carlson said that this working group has used a model in which the term "public review" meant that a document was honed by the various committees. Over the years different working groups have taken a looser view of what public review means, and this view is more like a "request for comment" as used by the Internet Engineering Task Force. Carlson and Terry say a "request for comment" allows one to release a document that is not a finished work product. Carlson noted that our P&P has no prohibition against "request for comments," and that the P&P encourages working groups to gather input by any way possible.

Peter Willis questioned whether a "request for comment" might not take as long to be made public as a formal "public review," since the TSC had to pass on the motion for a "request for comment," just as it must for a "public review." Bill Groener, the TSC Chair, responded by stating that the TSC does not need to pass on documents put out for "public comment."

Willis pointed out that the P&P has no procedure for a "request for comment." Groener pointed out that the lack of a specific procedure allows for more flexibility; the working group can invent the procedure and adapt as needs change.

Bob Goddard cautioned against setting the standards too high for "public review" in the future. We have never sent out a document that was considered perfect. We may doom ourselves to never going to public review with a document if documents must be perfect for public review. .

### 6.1 E1.11

#### 6.1.1 Conclusion of recirculated ballot on public review

Steve Terry and Steve Carlson turned the chair over to Bill Groener, the Chair of the TSC, so the working group could conclude the discussion and voting on recirculated ballot CP/99-1013 and they could participate in the discussion.

Some members of the working group were concerned about what effect a delay in sending the draft E1.11 document to formal public review would have on the IEC process, so Mitch Hefter gave his report on the IEC. [A printed version of his report, "IEC DMX512 Update," is appended to these minutes.] The DMX project has been given the project identifier "IEC 62136." Hefter said that the IEC committee can wait for our input document, and that the working group need not feel pressured to get the E1.11 document sent to the IEC before we feel that is ready.

Carlson called the question and the recirculated ballots were passed to Karl Ruling for tallying. Ruling announced that the motion to send the draft BSR E1.11 to a public review failed for lack of a super majority. The final tally was 15 accept, 1 accept in principle, and 11 reject.

Mitch Hefter moved that the current document (CP/98-1031r1.1) be sent to a request for comment, and that the DMX task group develop the cover letter describing the input desired and including the technical comments received to date, as well as the outline for the procedure and time line, and reconvene this afternoon to present that. Tim Bachman seconded the motion. The motion was approved unanimously by show of hands.

Terry moved that the CPWG take a different course of action, that the group accept any cover letter the task group drafts, and that only the document and the cover letter be sent for public comment, without any of the comments received so far. Ed Jones seconded.

Terry modified his motion so that the working group would review the task group's cover letter at 4:00. The modification was acceptable to Ed Jones. The working group approved the motion unanimously by show of hands.

Bill Groener thanked the task group for doing a great amount of work in difficult circumstances.

Groener returned the chair to Steve and Steve.

The rest of the agenda was followed in the following order up to item 10, Adjournment. At that point, approximately 12:25 p.m., the meeting recessed. It reconvened at 4:10 p.m. to discuss the draft cover letter. Mitch Hefter served as the recording secretary at that time.

When the meeting reconvened at 4:10 p.m., Steve Carlson instructed remaining WG members to read the Draft Request For Comment cover document as prepared by the DMX Task Group. The text was discussed and modified with the working group operating as a large task group.

Peter Brooks moved that document as modified be adopted and sent out as the cover to the RFC on BSR E1.11 rev 1.1. Eckart Steffens seconded. Motion approved unanimously by show of hands.

Richard Lawrence requested that comments be posted on the CPWG reflector as they come in. After some discussion Hefter agreed to post comments every few days, and not simply as they come in.

Eckart Steffens moved that the cover letter be provided to him for translation into German for posting on the VPLT website with pointers back to ESTA/USITT for the actual documents. The motion was seconded by Jerry Gorrell. Motion approved unanimously by show of hands.

The meeting then proceeded to Adjournment, item 10.

#### 6.1.2 IEC update

Hefter's report was given in 6.1.1 above. [Please see the written report, "IEC DMX512 Update," appended to these minutes.]

#### 6.2 E1.3

##### 6.2.1 Public Review comment resolution report (Goddard, Unwin, Fleenor, or others)

With the consent of the task group, the report was tabled until the next meeting.

##### 6.2.2 Analog Application Guide

Ruling restated his plea for comments. No comments had been received from the CPWG since the last meeting.

#### 6.3 Report of ACN Task Group

Carlson reported that the task group had a second interim meeting in July.

The task group investigated JINI but rejected it. The concepts elegant and useful, so some concepts for ACN will be borrowed from JINI.

Reliable multicasting has been an issue. None of the methods that now exist work. They are either too big, or are for streaming media where errors are not a show-stopper. Carlson reported that Greg Heinzle has come up with an elegant solution called STD (session data transport). It provides both reliable and unreliable data transport.

The group has also been developing a Device Description Language. XML is the model. Philip Nye has been working on this heavily.

Carlson reported that Michael Karagosian of AES24 is now working with the ACN group, so there is coupling between them. IEEE1394 (Fire Wire) is supported by lots of AES people, so the ACN task group has been asked to look into it and how ACN might work on it.

Heinzle has also been working on a DMP (Device Management Protocol). A draft of that should be ready for the July meetings.

Carlson expects stable documents in July 2000.

Philip Nye talked about AES24 and SC10. AES24 was a plodding standard that lost support. SC10 and its two subcommittees now are looking at networking technology in general, not simply AES24. Audio industry does not have the open standards model, which has hampered it. Philip Nye reported that he is our liaison with AES, since he is on the relevant committees both in ESTA's TSP and the AES

#### 6.4 Publishing DMX on Cat 5 report

Higgins reported that he is now testing to see if the Rosco/ET talkback will work on Cat 5 cable. It has RS485 transceivers coming on and off line, which might be a more complicated instance than sending DMX512 data. Carlson recommended that ISO/IEC nomenclature be used.

#### 6.5 Standard for moving lamp personalities

There was no report due to Wayne Howell's absence. Peter Willis offered apologies on behalf of Wayne, and said that Wayne is beset with booth problems.

### 7 New Business

#### 7.1 Report on IEEE 802.3 DTE Power via MDI Study Group

Carlson reported that the scheme is to supply power only if the device needs it. It will probably do so in a manner similar to phantom power supplies for electret microphones using the signal pairs. 802.3 uses center-tapped transformers, so power can be injected and picked off the center taps. Nine to 12 watts would be what could be delivered. Possibly the idle pairs could be used. Thee standard is predicted to be finished by July 2001.

Carlson reported that he is now an 802.3 voter representing ESTA, and thus speaking for 400 member companies.

#### 7.2 Interim policy on DMX512-1990 alternate start code registration

Hefter presented the interim policy document that had been distributed prior to the meeting.

John Sellers moved that the task group be directed to incorporate the modifications appropriate to the interim policy and that the policy then be approved as a working policy by letter ballot. The letter ballot period shall close at the next meeting. Tracy Underhill second.

Philip Nye moved that this motion be modified to close the ballot at the TSC meeting. This was acceptable to the seconder and original motion maker.

The motion that the task group modify the document and that the modified document be approved by letter ballot, with a ballot period to close at the TSC meeting was approved unanimously by a show of hands.

### 8 Other business

None.

### 9 Schedule for future meetings

Carlson announced that the next meeting would be at the Dallas/Ft. Worth Marriott in Irving, Texas, Saturday, January 22, 2000 from 9:00 a.m. to 6:00 p.m.

The following meeting, to be held in conjunction wit the USITT Conference and Stage Expo, will be in Denver, Colorado on Thursday, March 23, 2000, from 9:00 a.m. to 6:00 p.m.

The following meeting will be back in beautiful Irving on July 15, 2000, from 9:00 a.m. to 6:00 p.m.

The working group then recessed and reconvened, as described in 6.1.1 above.

### 10 Adjournment

Tim Bachman moved that the meeting adjourn. Doug Fleenor seconded the motion. The motion was approved unanimously by acclamation. The meeting was adjourned at 5:02 p.m.

IEC DMX512 Update  
November 17, 1999  
(by Mitch Hefter)

At the beginning of 1999, the ESTA Technical Standards Manager Karl Ruling, began work with the representatives from the US National Committee of the International Electrotechnical Commission (IEC). A proposal to make DMX512 an International Standard was submitted to the IEC in the spring of 1999. In August, the application was approved by IEC Technical Committee 34 (document 34/59/RVN) and the proposed standard was designated "Entertainment Technology - USITT DMX512 (IEC 62136)." Mitch Hefter of Rosco/Entertainment Technology and chair of the ESTA/USITT DMX512 Revision Task Group was selected to be the Project Team Leader.

The "Panel of Experts" is as follows:

Cyril Daly  
Zumbtobel Staff GmbH  
AUSTRIA

Giuseppe Ferrando  
E.R.C. Spa  
ITALY

Pierre Tarroux  
Thorn Europhane  
FRANCE

Michael Stein  
Magnetek  
USA

Gerd Sagert  
DIN  
GERMANY

Adam Bennette  
ETC Europe Ltd  
UNITED KINGDOM

Istvàn Kerényi  
GE Lighting Tungstram  
HUNGARY

Mr. N. Harada  
Japan Luminaire Association  
JAPAN

During the IEC meetings in Kyoto at the end of October, TC 34 formally assigned the project to Sub-Committee 34C (SC34C). The Chair of SC34C is also the Austrian representative on the Panel of Experts, and the secretary to SC34C is also the secretary to TC34 – Ms. Debbie Way of BSI.

There are several stages to the IEC process, starting with a Proposal stage, which was completed in August.

The Proposal stage is followed by Preparatory stage in which the Working Draft is developed, which is where we are now. This document becomes known as the Committee Draft (CD). Note that in cases such as DMX512 where the technical issues are well established and the subject matter is specialized, there may not be a great deal of direct contribution from the Panel of Experts in this stage.

Then comes the Committee stage, which is where the Review For Comment by the National Committees represented on SC34C occurs. No vote of any type occurs at this stage. The CD is circulated for between two and five months.

The Project Team then meets to review the comments received on the CD. Revisions are made, and unless a review of the revised CD is deemed necessary, the document becomes a Committee Draft for Vote (CDV) and is now also translated into French per IEC rules.

The CDV is circulated for Vote and further technical comment in the Enquiry stage\*. This is analogous to our ANSI Public Review, however it is done through the National Committees as noted above. It requires five months and 2/3 majority in favor of the CDV with less than 1/4 negative of the participating (principal) Technical Committee members.

If that is successful, the project becomes a Final Draft International Standard (FDIS). This FDIS is then circulated to the National Committees for a two month voting period – the Approval stage\*. This vote is simply a Yes/No/Abstain vote – only typos can be corrected. It is approved if, of the votes cast, 2/3 are in favor with less than 1/4 negative. Otherwise, it goes back to the Subcommittee. Final publication occurs within two to three months of approval.

\* Note - the CDV and FDIS documents are also submitted to CENELEC (the European electrical standards body) for parallel enquiry.

The ANSI DMX512 Public Review draft can serve as the Committee Draft (CD) – when we are ready – according to Debbie Way. Some minor formatting changes in the current document to correspond to IEC format (we are fairly close) will be required. We will work with Ms. Way so that such changes will be minimal, if at all.

Since the bulk of comments on the document that could be expected during the Committee stage will already have occurred through ESTA, the Committee stage will probably be set to last only 2-1/2 to 3 months. The ANSI Public Review and the ESTA CPWG responses are likely to serve as the U.S. National Committee commentary. Depending on when we go to ANSI Public Review and supply the IEC a draft, this meeting could occur as early as April in Helsinki, or be in London this June or even San Diego next October.





**CPWG Membership Roster**  
**At the End of the 18 November 1999 Meeting**

Name	Company	Parent co./ org represented	Voting Status	Interest cat.
John Sellers	AIM Northwest	AIM Northwest	P	G
Tony de Rijk	Amazing Controls! Inc.	Amazing Controls! Inc.	P	P
Peter Willis	Andera Ltd.	Andera Ltd.	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
Tim Bachman	Barbizon Light	Barbizon Companies	P	U
Tobin Neis	Barbizon Companies	Barbizon Companies	A	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.	P	G
Soo-Myong Chung	Bloch Design Group Inc.	Bloch Design Group Inc.	A	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
David George	Christie Lites Manufacturing Ltd	Christie Lites Manufacturing Ltd	P	P
Fred Lindauer	Compulite R&D	Compulite R & D	O	P
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
Gary Dove	Dove Systems	Dove Systems	O	P
Jussi Kallioinen	Eastway Sound & Lighting	Eastway Sound & Lighting	O	U
Ed Jones	Edwin Jones Co.	Edwin Jones Co.	P	P
Bill Fehrmann	Electrol Engineering, Inc.	Electrol Engineering, Inc.	O	P
Ed Prasser	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	P
Bruce Lehnus	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	O	P
Adam Bennette	Electronic Theatre Controls Ltd.	Electronic Theatre Controls, Inc.	O	P
Bill Florac	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	O	P
Dennis Varian	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	P
Jon Ide	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	P
Greg Heinzle	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
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	P
Dexter McNeil	Goddard Design Co.	Goddard Design Co.	A	P
Dave Higgins	Gray Interfaces	Gray Interfaces	P	P
Michael (Sandy) Twose	Gray Interfaces	Gray Interfaces	A	P
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	P	P
Lary Cotten	High End Systems	High End Systems	P	P
Scott Blair	High End Systems	High End Systems	A	P
Edwin S. Kramer	IATSE, Local 1	I.A.T.S.E. Local 1	P	U
John Huntington	IATSE Local 1	IATSE Local 1	A	U
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
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

Name	Company	Parent co./ org represented	Voting Status	Interest cat.
Gary Pritchard	LSC Lighting Systems Pty Ltd	LSC Lighting Systems Pty Ltd	O	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
Tim Cox	PLASA	PLASA	P	G
Tony Douglas-Beveridge	PLASA Standards Office	PLASA	A	G
Steve Terry	PRG Lighting Division	PRG	P	U
George Sabbi	PRG Lighting Group	PRG	A	U
George Kindler	Thoughtful Designs	PRG	A	U
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
Steve Carlson	Rosco/Entertainment Technology	Rosco Laboratories	P	P
Jon Farley	Rosco/Entertainment Technology	Rosco Laboratories	O	P
Mick Martin	Showcad Control Systems	Showcad Control Systems	O	P
Andre Broucke	ADB - TTV Technologies	Siemens	O	P
Richard Lawrence	Strand Lighting Ltd.	Strand Lighting	P	P
Milton Davis	Strand Lighting	Strand Lighting	A	P
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
Achim Russ	Transtechnik GmbH	Transtechnik GmbH	O	P
Hans Leiter	Transtechnik GmbH	Transtechnik GmbH	O	P
Anders Ekvall	Transtechnik GmbH	Transtechnik GmbH	O	P
Mitch Hefter	Rosco/Entertainment Technology	USITT	P	U
Paul Vincent	Vincent Lighting Systems	Vincent Lighting Systems	O	G
Eckart Steffens	SOUNDLIGHT	VPLT	P	G
Ken Wagner	Walt Disney Imagineering	Walt Disney	O	U
John Sondericker III	Wybron, Inc.	Wybron, Inc.	P	P
Keny Whitright	Wybron, Inc.	Wybron, Inc.	A	P
Peter Brooks	Zero 88 Ltd.	Zero 88 Ltd.	P	P
Richard Thornton Brown	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