

Minutes
Control Protocols Working Group
Thursday, March 19, 1998

Chairs: Steve Carlson, Rosco/ET
Steve Terry, Production Arts

Recording secretary: Karl G. Ruling, ESTA

Members in attendance: Tony de Rijk; Amazing Controls! Inc.; Principal (joined at this meeting)
Sierk Janszen; Avenger S.A.; Observer
Tim Bachman; Barbizon Light; Principal
Trevor Forrest; Celco; Alternate
Amit Resh; Compulite R & D; Observer
Doug Fleenor; Doug Fleenor Design; Principal
Gary Dove; Dove Systems; Principal (changed to Observer at this meeting)
Greg Heinzle; Electronic Theatre Controls, Inc.; Alternate
Ed Arend; Electronics Diversified Inc.; Principal
Tracy Underhill; Electronics Diversified Inc. (Colorado); Alternate (joined at this meeting)
Paul K. Ericson; Ericson Lighting Design; Observer
Robert Goddard; Goddard Design Co.; Principal
Dexter McNeil; Goddard Design Co.; Alternate
Dave Higgins; Gray Interfaces; Principal
Edward Paget; Jones & Phillips Associates, Inc.; Principal
Philippe Jean; Kunst Macchina Production Company; Alternate
Rick Leinen; NSI Corporation; Principal
George Sabbi; PRG Lighting Division; Alternate
Steve Terry; Production Arts; Principal
Steve Unwin; Pulsar Ltd.; Alternate (joined at this meeting)
Steve Carlson; Rosco/Entertainment Technology; Principal
Robert Barbagallo; Scéno Plus; Principal
Milton Davis; Strand Lighting; Alternate
Richard Lawrence; Strand Lighting Ltd.; Principal
Jerry Gorrell; Theatre Safety Programs; Principal
John Huntington; Thoughtful Designs (PRG); Principal
Brian Dowd; TMB Associates (NJ); Principal
Mitch Hefter; USITT (Rosco/Entertainment Technology); Principal

Visitors: Jay Topper; Production Resource Group

1 Opening Remarks

Steve Carlson called the meeting to order at 9:07 a.m. and welcomed all to Long Beach

2 Attendance and membership

2.1 Introductions of those present

Those present introduced themselves.

2.2 Determination of quorum (11 needed)

Steve Terry announced that we have a quorum

2.3 Recognition of alternate voting members

Trevor Forrest was voting for Celco, Mike Rothern being absent.
Greg Heinzle was voting for Electronic Theatre Controls, Ed Prasser being absent.
Philippe Jean was voting for Kunst Macchina, Louis-Philippe Demers being absent.

Some companies had principal and alternate voting members present:
Robert Goddard and Dexter McNeil for Goddard Designs
George Sabbi and John Huntington for PRG
Milton Davis and Richard Lawrence for Strand Lighting
Steve Terry reminded them that only one vote was allowed per company.

2.4 Requirements for membership

Steve Terry reminded the voting members of their commitment to attend four CPWG meetings a year.

Steve Terry asked Gary Dove if he would change his status to observer due to his lack of attendance.
Gary Dove agreed.

2.5 Processing of new membership requests

Tracy Underhill applied as an alternate for Electronics Diversified Inc. Unanimously accepted by show of hands.

Tony de Rijk applied as a principal for Amazing Controls! Unanimous by show of hands.

George Kindler of Thoughtful Designs applied as an alternate for PRG. Unanimous by show of hands.

Scott Blair applied as an alternate for High End Systems. Unanimous by show of hands.

Steve Unwin of Pulsar asked that Paul Mardon's status be changed from observer to principal. Tim Bachman moved that Mardon's status be changed to principal. Ted Paget seconded. Unanimous by show of hands.

Steve Unwin applied as an alternate for Pulsar. Unanimous by show of hands.

3 Approval of the minutes from the previous meeting

Steve Unwin objected to the way that the disposition of Mardon's proposal number 2 was reported in 6.2.3 of the draft minutes. Unwin said that Mardon said that the gist of his proposal had been accepted. Steve Terry suggested that the correct wording should be: "Steve Terry moved we reject the specific text of proposal number 2, but that the development and presentation of any examples of protection circuits shall be deferred to the DMX Protection Task Group established by the previous motion."

Steve Unwin also objected to the way the disposition of Mardon's proposal number 3 was reported in 6.2.3 of the draft minutes. Again, while the exact wording of the proposal had been rejected, the principal had been accepted. Terry suggested that minutes should read: "Steve Terry moved that we reject the specific text of proposal number 3, and defer to the DMX Protection Task Group any specifics of electrical protection of pins 4 and 5."

Unwin reported that Paul Mardon wanted the full findings of the VPLT internet survey to be reported in the section of the minutes dealing with Mardon's Proposal #5. Doug Fleenor pointed out that we had discussed the design of the survey at the meeting, and that the group had noted that the sampling method used -- a voluntary questionnaire, open to the entire German-speaking world -- does not yield statistics that are necessarily representative of the larger population. Fleenor was concerned that reporting on the VPLT questionnaire in the minutes would lend it a credence that the working group did not give it in the meeting. Ruling drafted the following line to insert in the minutes of the January

meeting: "It was noted in the discussion that because of the way the VPLT Internet survey was conducted, it may not be representative of the population of DMX users."

John Huntington moved that the minutes of the January meeting be approved as amended above. Bob Barbagallo seconded. Unanimous by show of hands.

4 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."

and 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."

There was a brief discussion of the patent issue. Only one patent has been revealed in this working group so far, which is the pending Colortran patent revealed by Rick Leinen of NSI/Colortran. His notice of the patent application was read into the minutes of the June 1997 meeting.

5 Approval of agenda

John Huntington asked that he be allowed to give a report on AES24 under "Other business." Dexter McNeil asked that "Other business" also include "DMX maintenance."

Ted Paget moved that the agenda be accepted with these two additions. Dave Higgins seconded. Unanimous by show of hands.

6 Old Business

6.1 E1.3 comment resolution (Fleenor et alia)

Most of the suggested resolutions to the comments drafted by Doug Fleenor were acceptable to the group, but there were a few items of contention:

There was a heated discussion of floating versus grounded signal commons. Different manufacturers make a practice of bonding the signal common to chassis and earth ground, and strongly feel that this is the only safe and legal procedure. Peter Brooks (Zero 88) had sent an e-mail message (CP/98-1014) to the chairs of the CPWG, Paul Mardon, and the TSM stating this opinion. This message was read to the group. Representatives from Pulsar and Celco concurred with Peter Brooks. Others on the working group felt that safe design did not require bonding the signal common to ground, and that this

practice was likely to result in ground loops and poor performance. There was no obvious solution that would allow signal common to be both bonded and not bonded to satisfy all parties.

During a short break Doug Fleenor drafted the following changes to section 6.4 of E1.3 to address this issue. The second paragraph was changed to read:

"Bonding the control common to earth ground can result in ground loops between receivers that are earth grounded to power sources which have different ground potentials. These ground loops can cause improper receiver operation. Ground loops can sometimes cause sufficient current to flow through the control cable to heat the cable causing safety problems as well as cable damage. Therefore it is encouraged that the control signal be isolated from earth ground at line frequencies (i.e. 60 Hz) to a minimum of 50 volts AC. A high resistance connection between common and earth ground may be provided to cause the common potential to remain near earth ground. A low impedance high frequency connection between common and earth ground may be provided for electro-magnetic compatibility (EMC) considerations. "

A third paragraph was added, saying:

"Some manufacturers believe it is necessary to bond control common to earth ground to meet the requirements of local legislation. Products that bond control common to earth ground must be clearly labeled in large type with the following text:"

"Control common bonded to earth ground"

There was also a discussion of the requirement for a receiver response curve, which had been deleted in the latest revision of E1.3. The sense of the group was that the requirement for manufacturers to reveal the curve should be included, but that no particular response curve should be required.

Doug Fleenor drafted the following second paragraph to be added to section 5.4:

"The response of the receiving device to control input shall be specified in the manufacturer's literature. This documentation can be in the form of a table, graph, or other appropriate format."

There was also a discussion of the load impedances that should be specified when measuring output voltages. Doug Fleenor suggested deleting the last line of the first paragraph of section 6.1.1 (the line referring to a load resistance of 20,000 ohms), and adding the following changes to the table in 6.1.1:

Under the "Console output at 0%" text in the table add the text:

"with a load resistance of 100,000 ohms"

Under the "Console output at 100%" text in the table add the text:

"with a load resistance of 20,000 ohms"

There was also a discussion of the maximum voltage for a "zero" signal. Steve Unwin put forth the Pulsar position that up to 0.4 volts should be allowed. There was a show of hands to determine working group support for this position. The majority felt that 0.2 volts was high enough for a "zero" signal. There were two votes for making it higher.

There was also a discussion of whether the minimum voltage for "full" should be 9.8V or 9.5V. Doug Fleenor moved that it should be 9.8V rather than 9.5V. Bob Goddard seconded. Unanimous by show of hands.

Doug made the following changes to E1.3: In the first paragraph of section 6.2.1, the last line is changed to read "...above 9.8 volts." The second line of the table is changed to read:

"0.2 volts to 9.8 volts Receiver should vary between its min. and max. output"

The third line of the table is changed to read:

"9.8 volts to 30 volts Receiver should remain at its maximum output."

Bob Goddard asked if the frequency of ripple in the signal needed to be addressed in the standard. The consensus of the working group was that this is not an issue.

Ted Paget moved that we accept the resolutions (CP/98-1021) to the comments with the above changes. Bob Barbagallo seconded. Unanimous by show of hands.

Dexter moved to send E1.3 to letter ballot for a second public review. Doug Fleenor seconded. Unanimous by show of hands.

6.2 DMX matters:

6.2.1 Recommended Practice for Protection Task Group Report (Willis)

No report.

6.2.2 DIN and DMX (Hefter)

Mitch Hefter gave Tony Douglas-Beveridge's report on the current DIN and DMX situation. Following the CENELEC Technical Board Meeting on March 10-12, Mike Lockton, who is the BSI Permanent Delegate to CENELEC, reported to Tony that the German delegate to the meeting had now agreed that DIN 56930 is an electrical standard and should therefore have been dealt with by CENELEC rather than CEN. As a result, CENELEC has decided to circulate the DIN 56930 standard to the other European National Committees under the Vilamoura Procedure. This is the result Tony Douglas-Beveridge had hoped to achieve when he originally briefed BSI on DIN/DMX.

How long it will take for DIN 56930 to go through the Vilamoura process is impossible for Tony Douglas-Beveridge to say at this time, reported Mitch Hefter. Under this procedure, National Committees are provided with copies of the standard and are requested to state whether or not they wish to participate in the development of the standard. BSI will respond positively for the UK. Tony has asked international members of PLASA via Standards News and his monthly report to the PLASA Executive, which is copied to all members to contact their respective National Committees to stress the importance of having a single common standard for DMX. Future action on developing the standard will be directly dependent on the level of interest expressed by the other National Committees. Any additional impetus that ESTA member companies may be able to provide through their European contacts would be most helpful.

Mitch Hefter also presented the USITT call for comments (CP/98-1015) and proposal form (CP/98-1017) for updating/amending the DMX512/1990 standard and the USITT request that ASC E1 (ESTA's Technical Standards Program) maintain USITT's DMX512/1990 (CP/98-1016).

6.2.3 DMX PICS Project (Douglas-Beveridge and Ruling)

Karl Ruling presented the latest versions of the DMX PICS documents. It is now two documents: one for receivers (CP/98-1008r1) and one for transmitters (CP/98-1012). Terry asked working group members to review the documents and send comments to Ruling by April 15.

The consensus was that the PICS's are not standards and will not be publicly reviewed. They will be put on the web as a service to DMX manufacturers and users who wish to check compliance.

6.2.4 DMX on Cat 5 Task Group (Higgins)

Dave Higgins gave a report of the task group's work. He surveyed manufacturers and found that there is interest in investigating Cat 5 cable for DMX. His preliminary analysis of Cat 5 UTP cable found that the characteristics are promising. It is designed for high frequency signals, although not for instantaneous changes of state. The nominal impedance is what we want, and the gauge is good. The nominal propagation velocity of 70% is better than the 60% velocity of conventional shielded DMX cable. The capacitance is good, as is the resistance. EMC is a concern. Higgins has found suppliers of punch-down connectors on PC board, which would make mounting DMX wall plugs.

Higgins identified some issues to be resolved if Cat 5 is suitable for DMX use. Specifically, should the installation rules be the same as for Ethernet? Some clients will think that installing Cat 5 for DMX will provide an upgrade route for TCP/IP. Consensus of the group was that applying Ethernet network rules for DMX would be overly restrictive. Higgins also pointed out that we would have an opportunity — if Cat 5 works — to set color-coding.

Higgins said that the testing has not been done yet, and that the methodology for this testing still needs to be done.

Steve Terry urged that the group proceed to testing as soon as possible, since EMC is the crux of the issue.

6.3 Report of 100MBPS Task Group (Terry)

Tim Bachman reported that the task group hadn't had time to respond to the comments, which were received in the few weeks before this meeting. A report will be available for the July meeting.

6.4 Report of ACN Task Group (Carlson)

Carlson reported that the task group is working at a high level of abstraction, but that the work is going well and that the group is united in its understanding of how to proceed. A hardware platform has been identified so that doesn't have to be developed by the task group. ACN will be tested over a variety of physical transports. A library of source code will be developed.

"With ACN you have to spend time crawling through it to see it's form," said Carlson. "It's not really that complicated. The DMP (Device Management Protocol) portion is the most difficult part."

Steve Terry asked that the task group develop milestones, and to release the parts of the work that have been done at those milestones. Carlson reported that the task group will set milestones that afternoon, but that nothing is at a point for public discussion yet.

7 New Business

None.

8 Other business

8.1 DMX maintenance

Dexter McNeil moved that the ESTA CPWG accept the request of USITT and the recommendation that the DMX512 standard be maintained by ASC E1, ESTA's Technical Standards Program. Tim Bachman seconded the motion. Unanimous by show of hands.

Terry asked for a chair of a task group to inaugurate changes to the standard. Mitch Heffer volunteered. A task group consisting of Bob Goddard, George Sabbi, Ted Paget, Doug Fleenor, Steve Unwin, Dave Higgins, and Steve Terry was appointed.

8.2 AES24

John Huntington read the following report from Jeff Berryman about the current status of AES-24:

Recent Events

In the Fall of 1997, SC-10-2 issued the first detailed draft architectural specification of AES-24, a document entitled "AES-24 Part 1 - Principles, Formats, and Basic Procedures". In line with standard AES procedure, this draft was published as a "for comment" specification, with the comment period lasting three months.

Over the course of the comment period, the group received a number of substantial and well thought out contributions. Many of the contributions addressed three related aspects of the protocol: addressing, the numbering system by which devices attached to the network refer to each other and to their component parts, initialization, the process by which devices on a network learn the addresses of other devices and their components, and internetworking, the rules and processes that allow the control networks of two or more network audio systems to be interconnected in an orderly manner.

On February 1, 1998, SC-10-2 met in Los Angeles to discuss the comments received. The discussion was extremely harmonious and productive. Its outcome was a new revision of AES-24 that incorporates almost all of the comments received. Based on a more robust addressing scheme, the new version has a simpler initialization process and a well-defined set of internetworking capabilities. As well, a number of smaller changes have been made to render the standard and its description more straightforward and easier to understand.

At this time, the formal draft of the revised Part 1 is in the final stages of preparation. Once it is complete, the AES will publish it as a new draft for comment, and another three-month waiting period will ensue. Although no one can say for certain, the group does not expect a large number of comments for this new draft. With luck, it can be finalized at the Fall AES Convention in September.

AES-24 Part 2

Although Part 1 describes AES-24's architecture ("Principles, Formats, and Basic Procedures"), the full documentation of the standard extends to a second document. SC-10-2 is now developing a document that the AES will publish as a draft for comment under the name "AES-24 Part 2: Class Hierarchy". Part 2 will describe the repertoire of specific elements ("classes") that make up AES-24-compliant devices.

The terms "class" and "class hierarchy" arise from the object-oriented methodology that SC-10-2 has used to design AES-24. Despite SC-10-2's use of this methodology, manufacturers implementing AES-24-compliant products will not be required to use object-oriented programming techniques. In the end, the AES-24 standard is nothing more than a set of message definitions and exchange rules which may be implemented using whatever programming approach is appropriate for the product at hand.

With the publication of the Part 2 draft, the AES-24 design will essentially be done. Even though Part 2 will not be in final form at first, the draft will define AES-24 well enough to allow many prospective implementers to begin conceptual and feasibility studies leading ultimately to product designs.

Part 2 will be a simpler document than Part 1. Depending on people's workloads and on the responses to the comments, it is possible that Part 2 could be finalized along with Part 1, at the Fall 1998 AES.

9 Schedule for future meetings

The next meeting is scheduled for July 11, 1998, at 9:00 a.m., in the Chicago area.

The exact address is:

Clarion International at O'Hare Airport
6810 N. Mannheim Rd.
Rosemont, IL 60018
847-297-8464
Fax 847-297-8744

10 Adjournment

Tim Bachman moved for adjournment. Gary Higgins seconded. No objections.
Meeting adjourned at 11:40 a.m.