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# Accredited Standards Committee\*

## NCITS, Information Technology

Doc. No.: T11/98-

Date: December 09, 1997

Project: FC0 Optical Working Group

Ref. Doc.:

Reply to: Schelto van Doorn/Steve Joiner

To: Membership of T11.2

From: Schelto van Doorn, Chair T11.2

Steve Joiner, acting chair FC0 optical working group

Bill Ham, Secy FC0 optical working group

Subject:

## Minutes of T11.2 Optical Working Group

December 09, 1997

### Agenda

1. Opening remarks and introductions (15 min)
  2. Attendance and membership
  3. Approve agenda
  4. Document Distribution
  5. Review minutes of previous meeting
  6. Review Old action items
    - 6.1 IEC 86B letter (and US National Committee)
    - 6.2 TIA document distribution
  7. Call for Patents
  8. 10 km specification
    - 8.1 Report on interim meetings/ results - Myers
    - 8.2 Discussion / Resolution of 10 km spec issues
  9. Colors for SM / MM differentiation
    - 9.1 Presentation of Building Wiring Standards - Szostak
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- 9.2 Discussion and recommendation by Committee
  - 10. Update on SG connector standardization
    - 10.1 Update on TIA/EIA documents - Ron Bossard (3M)
    - 10.2 Additional data on performance of the SG connector
    - 10.3 Up date on Receptacle (transceiver) drawings - Jim Tatum (Honeywell)
  - 11. New Business
    - 11.1 New Interface for 2+ Gb/s – Ali Ghiasi (30 min)
    - 11.2 TIA letter regarding return loss of 26 dB for SM applications
    - 11.3 MBI update: Schelto (MBI means modal bandwidth )
    - 11.4 30km SM technology - Ham
    - 11.5 SM white paper? Ham
    - 11.6 Recommendations for input to joint meeting
  - 12. Review Action Items (15 min)
  - 13. Next meetings
  - 14. Adjourn

## Results of Meeting

### 1. Opening remarks and introductions (15 min)

Steve Joiner opened the meeting and thanked the host, DPT for hosting the meeting. These minutes were taken by Bill Ham.

### 2. Attendance and membership

Attendance at plenary meetings does count toward minimum attendance requirements for T11.2 membership. Working group meetings are open to any person or organization directly and materially affected by T11.2's scope of work. The following people attended the meeting:

39 People Present

Status Key: P - Principal

A,A# - Alternate

O - Observer

L - Liaison

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V - Visitor

Attendees	Company	Telephone/Fax	E-mail Address
Michael Griffin	3M	612 733-6004 612 736-8140	megriffin@msmail.mmm.com
Ron Bossard	3M	512 984-3782 512 984-5210	rgbossard@mmm.com
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Ali Ghiasi	Sun Microsystems	650 786-3310 650 786-6457	ghiasi@eng.sun.com
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### 3. Approve agenda

After several modifications the agenda presented in these minutes was accepted. Tad moved and Schelto seconded: passed unanimously

### 4. Document Distribution

As there are presently no documents active in this working group there were no specific document distribution issues. However a summary of the presently active policy to document distribution is included for reference.

All presentations are posted electronically at the approved ftp within two weeks after the meeting. Format must be an approved electronic file format. While we are still paper based, a paper copy must also be given to the secy at the working group meeting.

(Presentations are defined as material shown publicly in the Plenary or authorized working group meetings.)

For postings prior to meetings the following is available: ftp site:

[ftp.dpt.com/t11/member/incoming](ftp:dpt.com/t11/member/incoming).

User ID is: t11member and

Password is available from Roger Cummings or Schelto van Doorn

We will be moving towards all electronic distribution.

A T11.2 reflector is in the process of being set up.

An electronic procedures document is being prepared by Steve Joiner.

The committee will form its agenda by the following:

- A call (reminder) for presentations by the chair 3 weeks in advance
  - Those wanting to be on the agenda submit request including:
    - title
    - presentor
    - time required
    - abstract
  - Chair creates agenda and posts 2 weeks in advance of the meeting
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At the meeting it is the member's discretion to allow additional presentations

## 5. Review minutes of previous meeting

The minutes of the Tucson optical working group were reviewed and approved with the following changes: None

James Myers moved and Tad seconded: approved unanimously.

## 6. Review Old action items

### 1. IEC 86B letter (and US National Committee)

Tad lead the discussion and the letter was modified significantly.

Jim Tatum moved and Tad seconded that the modified letter be submitted to 11.2 plenary for approval. Motion passed 23/0

### 2. TIA document distribution

Ron Bossard presented a letter from TIA stating that it is permissible for the T11.2 to have copies of the relevant TIA documents under certain conditions. A letter needs to be written to TIA supplying the details of the information that T11.2 would like to have.

T11.2 plenary needs to write this letter.

Steve Joiner to draft a letter to TIA requesting the specific information for consideration at the T11.2 plenary.

## 7. Call for Patents

There was no response to the call for patents.

## 8. 10 km specification

(ESTIMATE 2hours + additional presentations)

### 1. Report on interim meetings/ results - Myers

James presented the results of the interim meetings. Agreement has been achieved for most of the issues.

James took an action item to document the inputs to the model that resulted in the parameters that appear in the standard. This document will be made available for future reference in the T11.2 "library" system.

### 2. Discussion / Resolution of 10 km spec issues

The "issues" list created at the Tucson meeting was reviewed in detail

Motion to leave the extinction ratio at 9dB moved Schelto seconded by Ali Ghiasi Motion passed: 20/0/8

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An additional section will be added to address the measurement of rise and fall time.

Dan Brown moved and Steve J seconded that the following text be added to the document:

"Optical response time specifications are based on unfiltered waveforms. For purposes of standardizing the measurement method, measured waveforms shall conform to the mask defined in Fig x. If a filter is needed to conform to the mask, the filter responses effect should be removed using the equation:

$$T_{\text{RISE/FALL}} = \sqrt{(T_{\text{RISE/FALL\_MEASURED}})^2 - (T_{\text{RISE/FALL\_FILTER}})^2}$$

Where the filter may be different for rise and fall. Any filter should have an impulse response equivalent to a 4th order Bessel Thompson filter." motion passed. 24/0/2

Mike Dudek moved and Schelto seconded that 100-SM-LC-L be accepted as the official name of this variant.

Motion passed: 27/0/3

The group noted that a simpler document format would be useful.

The restrictions that: (1) no OFC and (2) 7.8 dB passive loss budget not be exceeded will allow the LC-L to interoperate with the LL-L. These restrictions will be added to the document.

Action Item: James to add these requirements

Ron Soderstrom moved and Ali Ghiasi seconded that 10 km LC specification have the following incorporated: Gigabit Ethernet wording relating to jitter and FC MJS numbers for the specifications.

Motion passed 18/2/3

James Myers noted that the optical power levels should be specified when doing the jitter measurements.

Motion made by James Myers and Mike Dudek seconded that a sentence be added that states that the jitter compliance of a receiver be made at an optical power level of [minimum launch output power - passive loss in the fibre]. In this specific case of LC-L the power level would be -9.5dBm - 7.8dB = -17.3dBm. The measurement shall be taken at minimum extinction ratio and the maximum rise and fall time (suitably adjusted to keep the jitter measurement constant.)

Motion passes: 18/0/5

The technique for adjusting for the jitter was described by Steve, reviewed by the committee and will be incorporated into the document.

Action item: Steve Joiner to supply the jitter adjustment procedure to

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account for the maximum rise and fall time requirement for the LC-L document.

It was noted that a 30 km SM variant (if agreed that the group will develop a 30km variant) could use exactly the framework developed for the LC-L document with a few numbers changed.

## 9. Colors for SM / MM differentiation

This item was not addressed due to lack of time

### 1. Presentation of Building Wiring Standards - Szostak

This item was not addressed due to lack of time

### 2. Discussion and recommendation by Committee

This item was not addressed due to lack of time

## 10. Update on SG connector standardization

### 1. Update on TIA/EIA documents - Ron Bossard (3M)

Ron gave the report on these documents. There were 3 negative comments from the initial letter ballot at TIA. These comments are expected to be resolved at the January TIA meeting. Both MM and SM applications are included in these specifications. It was recommended that an 8° bevel be added to the optical interface. This was agreed as a good thing to do.

### 2. Additional data on performance of the SG connector

Jim Tatum showed data from multiple repeated matings on the SG transceiver on SM, 50 micron MM, and 62.5 micron MM. This data showed very little difference between the connector losses for the different fiber types and excellent stability between different mating cycles.

Tad Szostak presented data on the SG connector's performance for SM applications using the 8° polish interface.

Action item: Tad to supply the performance data to Schelto for the SG connector

There are a number of manufacturers that have indicated their intention to license the SG connector.

The number of SG connectors allowed for the LC-L specification will require consideration of the passive loss budget.

### 3. Up date on Receptacle (transceiver) drawings - Jim Tatum (Honeywell)

Jim reviewed the latest drawings and material to be placed in the FC

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PI98 standard for the receptacle. It was requested that statements be added to clarify the relationship between the PI98 sections and related interfaces in TIA documents.

## 11. New Business

### 1. New Interface for 2+ Gb/s – Ali Ghiasi (30 min)

This presentation began a look at the issues with the copper inside enclosures including optical interfaces. A major reason is to reduce the EMI.

The main points were to reduce the amount of electrical energy dissipated in the box. This can be accomplished by reducing the amplitudes. The LVDS technology was noted as a good way to move in this direction. He also proposed 50 ohm lines as "tightly coupled" and easy to manufacture. On the silicon side the HSTL technology was noted as a good option. HSTL = high speed transceiver logic.

There was considerable support for this idea in the sense that lower energy consumption is good. The existing IEEE 1596.3 LVDS specification may not apply directly.

Steve Joiner moved and Schelto seconded that the optical ad-hoc recommends that an SD3 be written which develops electrical I/O specification for serial and parallel interfaces (e.g. 10 bit) for intra-enclosure applications and target speeds of 2x and 4x on this general subject.

motion passed 21/0/2

### 2. TIA letter regarding return loss of 26 dB for SM applications

(see Schelto's web page for letter)

A letter from TIA requesting whether T11.2 believed that -26dB was adequate for future data rates and applications.

The group discussed this point and noted that new laser designs are less sensitive to back reflections. Steve noted that CATV applications could not use the -26 dB (would need better).

The group approved that -26dB was adequate by a vote of 25/1/2.

Schelto took an action item to respond to TIA with a letter stating that -26 dBm was adequate.

### 3. MBI update: Schelto (MBI means Modal Bandwidth Investigation)

also review DMD news

Schelto reviewed the DMD (differential mode delay) status (IEEE 802.3z)

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Mode conditioning is now mandatory for multimode applications. SW had much less of a problem with DMD than the LW. A mode conditioning jumper cable is one that delivers the light to the MM fibre off center. This avoids the "sweet spot near the center of the fibre" that can propagate very rapidly.

The issue is not settled.

Short wave applications also have concerns and will need

David Cunningham, HP, wrote a tutorial on the DMD issue.

Action item: Schelto to put a copy of the DMD tutorial on his web site.

#### 4. 30km SM technology - Ham

- a need for longer than 10 km exists. There was considerable interest in pursuing this in the same way as the SM LC-L was generated. At the next meeting folks should bring the technical specifications that could be used to achieve these lengths. Bill Ham offered to provide "scribe" service for these new suggestions. This will be on the agenda for discussion at the next meeting and for folks to bring specific data and requirements.

#### 5. SM white paper? Ham

Bill Ham asked if the FC0 optical group would be interested in developing a "white paper" on single mode technology. His interest was mainly in simplifying the physical interconnect since SM "does it all" and could offer a single solution. After some discussion it was decided that this effort would not be addressed in the FC0 working group.

#### 6. Recommendations for input to joint meeting

The salient items discussed during the working group were listed for presentation to the joint working group.

### 12. Review Action Items (15 min)

1. Steve Joiner to draft a letter to TIA requesting the specific information needed by T11.2 for consideration at the T11.2 plenary.  
Status: new
  2. James Myers took an action item to document the inputs to the model that resulted in the parameters that appear in the standard. This document will be in a mailing and will be available for future reference in the T11.2 "library" system.  
Status: new
  3. Steve Joiner to supply the jitter adjustment procedure to account for the maximum rise and fall time requirement for the LC-L document.
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Status: new

4. Tad to supply the performance data to Schelto for the SM SG connector for posting  
Status: new
5. Schelto took an action item to respond to TIA with a letter stating that -26 dB was adequate.  
Status: new
6. James Myers to put the latest LC-L into the mailing  
Status: new
7. Schelto to convert the spreadsheet from James Myers for low cost SM to Excel so that commas may be used for ISO.  
Status: carried over
8. Tom Lindsay will come up with a mechanism for deviation from 9dB extinction ratio and clarify receiver overload (avg power and peak to peak) for discussion before next meeting  
Status: done
9. Schelto to put copy of DMD tutorial on the websight.  
Status: new

### 13. Next meetings

The next meeting will be requested for Tuesday February 10, 1998 in San Diego from 9AM to 4PM.

### 14. Adjourn

Tad moved Schelto seconded to adjourn. Meeting adjourned at 3:50 PM.

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