

**Accredited Standards Committee  
X3, Information Technology**

<b>Doc. No.:</b> X3T10/95-196r0
---------------------------------

**Date:** April 19, 1995

**Project:**

**Ref. Doc.:**

**Reply to:** John Lohmeyer

To: Membership of X3T10

From: Larry Lamers Vice-Chair X3T10  
John Lohmeyer, Chair X3T10

Subject: Minutes of X3T10 Server SPI Study Group Meeting  
Denver, CO -- April 11, 1995

---

### **Agenda**

1. Opening Remarks
  2. Approval of Agenda
  3. Attendance and Membership
  4. Physical Topics
    - 4.1 Power Dissipation [Gingerich]
    - 4.2 Summary of Tradeoffs [Ham]
    - 4.3 AC Termination
    - 4.4 Alternate Topologies
  5. Other Topics
  6. Meeting Schedule
  7. Adjournment
- 

### **Results of Meeting**

#### **1. Opening Remarks**

John Lohmeyer, the X3T10 Chair, called the meeting to order at 9:00 a.m., Tuesday March 7, 1995. He failed to thank the host (himself).

As is customary, the people attending introduced themselves and a copy of the attendance list was circulated. Copies of the draft agenda and general information on X3T10 were made available to those attending.

#### **2. Approval of Agenda**

The draft agenda was approved.

#### **3. Attendance and Membership**

Attendance at working group meetings does not count toward minimum attendance requirements for X3T10 membership. Working group meetings are open to any person or organization directly and materially affected by X3T10's scope of work.

The following people attended the meeting:

John Lohmeyer      Symbios Logic

Larry Lamers	Adaptec
Bill Ham	Digital Equipment
Tak Asami	Western Digital
Paul Aloisi	Unitrode
Yousef Vazir	Adaptec
Mike Fitzpatrick	Seagate
John Ives	Symbios Logic
Mark Nossokoff	Symbios Logic
Dennis Haynes	Burr-Brown
Justin McEldowney	Burr-Brown
Tracy Spittler	Symbios Logic
Frank Gasparik	Symbios Logic
Richard Mourn	Symbios Logic
Ting Chan	QLogic
Dean Wallace	Linfinit
Kevin Gingerich	Texas Instruments
David Steele	Symbios Logic
Wally Bridgewater	Adaptec
Norm Harris	Adaptec

#### 4. Physical Topics

##### 4.1 Power Dissipation [Gingerich]

Kevin Gingerich presented an analysis of the power dissipation using existing differential drivers. He commented that the common mode voltage needs to be constrained to less than 7 v D.C.

Kevin's model stated that the current supplied by the driver when turned on must be supplied for the time period that is needed to stabilize the bus (two round trip delays). David Steele pointed out that up to four pulses can be on a 25 meter cable at one time.

Kevin stated that integrated drivers require you to get to 50 mW average dissipation per driver. Reducing the Vcc to 3 volts significantly reduces the power dissipation (to around 40 mW) because it is a squared relationship.

John Lohmeyer stated that reducing the number of lines that are biased could reduce the power dissipation somewhat and balance the loads. Candidates are the C/D, I/O, MSG, ATN, REQ, and ACK signals. If SCAM is supported, then C/D, I/O, and MSG would need to be biased.

Wally Bridgewater stated that the goal should be 1/2 watt dissipation for a 16-bit bus. This allows the other SCSI circuitry to dissipate 1/2 watt for a total package dissipation of 1 watt.

The big load is the cable.

Lowering Vod also helps reduce power dissipation but eats into the noise margin.

Kevin stated that eliminating the backward compatibility requirement would allow us to consider us Low Voltage Differential Signaling (LVDS). This method is used by SCI (IEEE 1596) and is being considered as a replacement for RS-422. In a 3 volt process the dissipation is around 20 mW.

##### 4.2 Summary of Tradeoffs [Ham]

Bill Ham constructed a chart listing the tradeoffs for various options.

An interface compatible with today's SE and LVDS is the goal. The price is adding 30 pins, a reference voltage, and additional drivers. This is not compatible with present differential implementations.

The standards work the needs to be done:

- LVDS differential sensing [Ham]
- LVDS pinout [Lohmeyer]
- LVDS signaling levels [Gingerich, Ham]
- LVDS termination [Aloisi]
- LVDS cable specifications [Ham]
- LVDS architectural document [McGrath]

The persons named in brackets is assigned an action item to complete the necessary wording for that section.

John Lohmeyer stated that as soon as Jim McGrath provided the scope and goals write-ups he would prepare the project proposal.

#### **4.3 AC Termination**

Paul pointed out that AC termination does reduce the system power even if it does not solve the driver problem.

#### **4.4 Alternate Topologies**

Bill Ham and Jim McGrath plan to co-author a technical report on alternate topologies. This will include three sections: 1) real protocol length limits; 2) repeaters; and 3) bridges.

### **5. Other Topics**

There was some informal discussion of the issues surrounding bridges and repeaters. As mentioned above, Bill Ham and Jim McGrath plan to submit a document as a candidate for a technical report on this subject.

### **6. Meeting Schedule**

The next meeting of X3T10 Server SPI Working Group will be May 9, 1995, in Harrisburg, PA at the Sheraton Inn Harrisburg (717-561-2800), hosted by AMP Incorporated.

### **7. Adjournment**

The meeting was adjourned at 1:30 p.m. on Tuesday April 11, 1995.