

1.0 The meeting opened at 2:00 pm.

2.0 Attendance:

Mr. Bernhard Laschinsky	Agere Systems
Mr. Ken Paist	Agere Systems
Mr. Minchuan Wang	Dell
Mr. Allen Parsons	Foxconn
Mr. Rob Elliott	Hewlett Packard Co.
Dr. William Ham	Hewlett Packard Co.
Mr. James Rockrohr	IBM
Mr. Harvey Newman	Infineon
Dr. Mark Seidel	Intel Corp.
Mr. Michael Jenkins	LSI Logic Corp.
Mr. Richard Uber	Maxtor Corp.
Mr. Galen Fromm	Molex Inc.
Mr. Yuriy Greshishchev	PMC-Sierra
Mr. Alvin Cox	Seagate Technology
Mr. Dan Smith	Seagate Technology
Mr. Kevin Witt	Vitesse Semiconductor
Mr. Amaresh Malipatil	
Mr. Mahbubl Bari	
Mr. Michael Hopgood	

19 People Present

3. Agenda

3.1 05-397r1 (Newman) SAS-2 Start-up training sequence

<http://www.t10.org/ftp/t10/document.05/05-397r1.pdf>

Extend the final window for training to be acknowledged and changed the sequence of training patterns. Infineon's suggestion is that about 20 mS would be sufficient for training. Concerns expressed that the first PHY trained stops sending a training pattern. May need a handshake in the final training sequence so the slower PHY has time to complete training. Various ways for this to happen were mentioned.

Question of whether anything more than a pseudo-random pattern is needed. Infineon would like to see at least a low frequency pattern that will have an open eye to initialize on. DFE training may be enhanced by lone bit. A known pattern may have some advantage.

The five non-8b/10b patterns may have a significant impact to hardware design for supporting them. PMC and Vitesse seem to favor pseudo-random only.

Discussed whether JTPAT should be included in the speed negotiation sequence. Although stressful, it doesn't seem to belong here.

It may be better if the special patterns proposed by Infineon are based on 10 bits. $f/10$, $f/20$, etc.

Questions from this discussion to be talked about at the January T10:

- A. Consider what is required if transmitter tuning is needed. This is probably a G4 requirement and possibly an optional feature for G3. It will help us determine the G4 timing window.
- B. What is the hardware impact for the special patterns proposed by Infineon to obtain an open eye for initial receiver equalization setting?
- C. Is such a pattern sequence actually required? Could disparity violations be used to extend sequences of 0's and 1's?
- D. What is the training time if only random data? Is random data alone sufficient (8b/10b compliant)?
- E. Does training with patterns that don't happen with real data cause settings that may not be optimized for real data?

3.1.2 Galen Fromm needs to supply models of 10 meter cables so that numbers can be determined for transmitter and receiver devices.

3.1. PHY specification development draft 06-011r0
<http://www.t10.org/ftp/t10/document.06/06-011r0.pdf>

Discussed several issues regarding StatEye. It is not currently set up for 8b/10b coding.
 Is the simulation correct for SAS?
 How is jitter considered?
 Is there a better way?
 How is the reference receiver adjusted?

The following items are notes from the previous call. The 10-meter cable information is needed for determining values for the transmitter and receiver devices.

3.1.1 Receiver specification. (Pages 14 and 15)

Reference receiver implies need for reference transmitter de-emphasis
 Reference receiver does not imply implementation, only a performance requirement. Same comment applies to transmitter.
 Proposed receiver test device to be updated.

3.1.2 Transmitter specification (Pages 10 and 11)

Option for adaptive transmitter?
 Return loss is a complicated issue. Look at Fibre Channel as far as looking at transmitter versus receiver.
 Question about transmitter jitter requirements.
 Rise and fall time: Is a maximum needed?
 5 ohm matching may be too loose.
 Pre-emphasis limit may be too high.
 How much of the transmitter device characteristic should be specified?
 Is a reference link for the transmitter device a right approach? FCAL has been working on this.
 Reference T11 05-346v1.

3.1.3 Channel specification. (Pages 12 and 13)

Need to improve current compliance channel requirement of SAS 1.1.
 Question about S-parameter repeatability and correlation.
 Need much effort in this area.

4.0 Meeting ended at 3:55 pm.