1. Opening Remarks
The meeting opened at 9:00 am. Alvin thanked LSI for sponsoring the September meeting. Participants then made self-introductions.

2. Attendance
Mr. Mark Lettang 3M
Mr. Charles Hill Alta Engineering
Mr. Paul von Stamwitz AMCC
Mr. Gregory McSorley Amphenol Interconnect
Mr. Kevin Marks Dell, Inc.
Mr. Douglas Wagner FCI
Mr. Elwood Parsons Foxconn Electronics
Mr. Mike Fitzpatrick Fujitsu
Mr. Rob Elliott Hewlett Packard Co.
Mr. Barry Olawsky Hewlett Packard Co.
Mr. Dan Colegrove Hitachi Global Storage Tech.
Mr. James Rockrohr IBM
Dr. Mark Seidel Intel Corp.
Mr. Pak Seto Intel Corp.
Mr. Brian Day LSI Corp.
Mr. Michael Jenkins LSI Corp.
Mr. George Penokie LSI Corp.
Mr. Greg Shogan LSI Corp.
Mr. Tom Palkert Luxtera
Mr. Kevin Witt Maxim Integrated Products
Mr. Galen Fromm Molex Inc.
Mr. Jay Neer Molex Inc.
Mr. Michael Rost Molex Incorporated
Mr. Tim Symons PMC-Sierra
Mr. Gourgen Oganessyan Quellan
Mr. Alvin Cox Seagate Technology
Mr. Benoit Mercier STMicroeletconics, Inc.
Mr. John Hackman TycoElectronics
Mr. Michael Fogg TycoElectronics
Mr. Dan Gorenc TycoElectronics
Mr. Tom Grzysiewicz TycoElectronics
Mr. Scott Shuey TycoElectronics
Mr. Mark Evans Western Digital
Mr. Larry McMillan Western Digital
Mr. Bill Pagano Xiotech Corp.
Mr. Alan Westbury Xyratex

36 People Present

3. Review of documents and proposals
Two groups of proposals and documents were reviewed; the first being related to SAS 2.0 and the second to SAS 2.1.

4. SAS 2.0 letter ballot resolution
4.1 SAS-2: Making 07-193r1 into an Annex (08-312r3) [Penokie]
This is one of two proposals to resolve letter ballot comments on how to include s-parameter files in the specification as normative information in addition to providing the background information regarding how the files were generated. Several editorial changes were made to these proposals. George updated them and the revised versions will be incorporated in the next revision of SAS 2.0.

4.2 SAS-2: Making 07-267r1 into an Annex (08-313r2) [Penokie]
This is the second of the two proposals mentioned above. Several editorial changes were made. There was no opposition regarding these two proposals (as updated) as the proper way to resolve the issues outlined by the letter ballot comments.

4.3 SAS 2.0 miniSAS 4x key dimensions (08-328r0) [Neer]
No additional comments were made concerning the configuration or dimensions. A question concerning the licensing was asked. The Molex position was documented in the August 28 SAS PHY conference call minutes. See 08-348r0 for details. Alvin will work with Jay to provide text for next week’s revision of SAS 2.0.

4.4 SAS-2 RX Simulation Matlab Code (SASWDP) (08-345r1) [Jenkins]
Discussed concerns that Rob Elliott had regarding the code.
Question: For simulations of channels, we use $10^{-15}$. Would that be more appropriate for this simulation too? Current software uses $10^{-12}$.
Response: It’s not clear what impact this would have on the measured penalty, but it is a simple thing to investigate.

Question: Should the pass band normalized to signal speed be based on the SymbolRate variable so it works properly at non-6 Gbps rates like 1.5, 3, and 12 Gbps?
Response: This could be made rate-agnostic, if the bandwidth is not expected to change with signaling speed.

Question: The assumption that the scope has a 7.5 GHz Bessel-Thomson filter seems based on the theory that the scope needs a filter at 0.75 times the rate (which for this algorithm was originally 10 Gbps Ethernet). This code seems to scale that down to .75 x 6 Gbps (5.1 GHz). However, what if the filter that was present in the scope that was used to generate the .txt files was 7.5 GHz? Is it more important that the WDP code filter match the filter of the actual scope used, or that it be 0.75 times the rate? Is it important that the scope filter be 5.1 GHz rather than 7.5 GHz for SAS measurements?
Response: This is not intended to emulate the noise filter in an optical scope's front-end, which is typically a Bessel filter and not a Butterworth as used in the script. This is intended to be a anti-aliasing filter used prior to the sampling function in the reference receiver. The procedure for electrical waveform captures typically requests that scope front-end is fairly wide-open (e.g. in excess of 12 GHz). This should prevent double-counting of filter-related penalties.

4.5 Reference Receiver Solutions for SAS-2 Compliance Testing (08-330r1) [Witt]
Kevin shared the latest updates indicating this code is looking very promising. Since StatEye support has been minimal the last couple of months and issues have been exposed, this alternate software could be the solution to our simulation software deficiency. There are a few areas that need to be addressed by the group. Kevin has offered to keep a list of code improvements and Mike Jenkins will forward those to Adam, but the number of revisions should be minimized. The following items were identified:
Need to determine SAS CJTPAT differences.
Need to understand how to model RJ and DJ specs in Tx compliance test.
Need more users trying this code with real hardware. This is especially important so that Maxim is not providing the only input to specification numbers. It is in everyone’s best interest to have several people working this. Not only does it provide a wider range of tested hardware, it provides additional specification review to avoid mistakes due to familiarity.
Observations:
Initial runs complete and a few issues observed.
With some work this code can serve as a Reference Rx.
With this code and some specification changes we will be able to wrap up the open technical
SAS-2 compliance test Issues/comments.
Alvin will work with Kevin on the specification text.

4.6 Open letter ballot PHY comments (REFER PHYSICAL)
There were 81 remaining PHY comments to be addressed all of these except those related to
SASWDP (transmitter and receiver simulation testing) were addressed.

5. SAS-2.1 topics

5.1 SAS-2 Mini SAS 8i connectors and cable assemblies (07-449r0) [Elliott]
Not discussed.

5.2 Proposal for SAS 2.1 Specification to Enable Support for Active Cables (08-358r0)
[Oganessyan]
Please review this proposal along with 08-359r0. The SAS PHY working group will be voting on
inclusion of this proposal in SAS 2.1 at the November meeting.

5.3 Validation of the Power Supply Voltage Detection Logic Circuit Proposed in 08-358r0 (08-
359r0) [Oganessyan]
Provides data regarding the reference voltage detection circuit included in 08-358r0. No issues
were observed from the presentation.

6. New business
None.

7. Review of Recommendations
None.

8. Meeting Schedule
Conference calls 10:00 am CDT
Tuesday Sept 23, Thursday Oct 2, 9, 16, and 23.

Toll Free Dial in Number: (877)810-9442
International Access/Caller Paid Dial In Number: (636)651-3190
PARTICIPANT CODE: 3243413

Webex information:
https://seagate.webex.com/seagate
Topic: SAS-2 PHY WG
Date: Thursday
Time: 10:00 am, Central Daylight Time
Meeting number: 826 515 680
Meeting password: 6gbpsSAS

9. Adjournment
The meeting was adjourned at 2:30 pm.