

## Attendance

Mr. Bernhard Laschinsky	Agere Systems
Mr. Ziad Matni	Agere Systems
Mr. Ken Paist	Agere Systems
Mr. Barry Olawsky	Hewlett Packard Co.
Mr. Rob Elliott	Hewlett Packard Co.
Mr. Dan Colegrove	HGST
Mr. James Rockrohr	IBM Corp.
Mr. Schelto van Doorn	Intel Corp
Dr. Mark Seidel	Intel Corp.
Mr. Michael Jenkins	LSI Logic Corp.
Mr. Praveen Viragahaven	LSI Logic Corp.
Mr. Tim Hوجلund	LSI Logic Corp.
Mr. William Petty	LSI Logic Corp.
Mr. Wei Zhou	Marvell
Mr. Jeff Choun	Marvell
Mr. Paul Wassenberg	Marvell
Mr. Yuriy Greshishchev	PMC-Sierra
Mr. Alvin Cox	Seagate Technology
Mr. Dan Smith	Seagate Technology
Mr. Bruce Johnson	Seagate Technology
Mr. Doug Loree	Toshiba
Mr. Kevin Witt	Vitesse Semiconductor
Mr. Adrian Robinson	Vitesse Semiconductor
Mr. Gregory Tabor	Vitesse Semiconductor

24 People Present

## Agenda:

1. Training sequence/speed negotiation and SSC

<http://www.t10.org/ftp/t10/document.06/06-263r1.pdf>

Discussed Rob's updated proposal that includes a shift in position on SSC method plus adds spec details for other areas that will need to be updated. A follow-up teleconference will be held on June 23 to continue discussing the proposal. Special items discussed during today's call:

End devices only need to transmit with downspreading.

All receiver devices need the ability to accept center spreading, down spreading, or no SSC. The G3 window is proposed as the last window for speed determination. If nothing happens during that window, the previously negotiated window (G1 or G2) is the speed. The G3 window would be run at 1.5 Gbps and include data transfer at the end to communicate speed and SSC capability and possibly other information. This would allow the next window to be the final speed negotiation window with receiver equalization tuning (G3 and faster). We discussed when SSC should be turned on. Although easier to turn on prior to tuning the receiver device, it may be preferred to turn on afterwards. Items needing investigation/comment:

- Should SSC be on or off during receiver equalization setting?
- Is it viable to make a drive have independent SSC control on the transmitters of its two ports? Independence is required to set the receiver equalization without SSC since one port may be operating prior to the other one performing speed negotiation.

- In the beginning of the final speed negotiation window, does there need to be an idle time or can both devices immediately start transmitting the training pattern? It is assumed that if G2 is required, the sequence would follow the SAS 1.1 standard.
- It is assumed that all expanders and initiators are capable of receiving downspread SSC. Are there any known exceptions?
- Will an initiator or expander accept downspreading from a SAS device running at G1 or G2 speed?
- If a phy transmitter has SSC disabled or is using downspread SSC only, it could get away with inserting fewer ALIGNs - 1/128 (the SATA ratio) would cover sending to either SAS or SATA phys with downspread SSC. Is that complication worth a 0.8% performance improvement? (e.g. at 6 Gbps, this is 4.77 MBps).
- Rob will contact Harvey Newman to work on the speed negotiation window. Please note any special requirements that may be needed.

If at all possible, it would be of great benefit to have the SSC and speed negotiation sequence resolved at the July T10 meeting by completing updates to 06-263 and 05-397. These items are the most critical as they impact ASIC design. Other specification issues are likely to be controlled by adjustable parameters while these issues likely affect basic hardware design.

2. Next conference call June 23, 2006

PARTICIPANT INFORMATION:

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<https://seagate.webex.com/seagate>

Topic: SAS-2 PHY WG

Date: Friday, June 23, 2006

Time: 10:00 am, Central Daylight Time (GMT -05:00, Chicago)

Meeting number: 826 515 680

Meeting password: 6gbpsSAS