Report of T11.2 plenary
February 11, 1997

MEMBERSHIP
The previous membership was 38, the present membership is 41. Gain of 7 loss of 4.

MEMBERSHIPS IN JEOPARDY
- AMCC
- General Dynamics
- The JPM Company

NEW MEMBERS
Madison Cable becomes a new member organization with Ron Crouch as the Principal Representative, & Michael J. Karg as the Alternate Representative

Molex Corporation becomes a new member organization with J. Michael Nauman as the Principal Representative, & Jay Neer as the Alternate Representative

Tensolite becomes a new member organization with Albert F. Kelley as the Principal Representative, & Bill Kuypers as the Alternate Representative

Resignations
VLSI Technology resigns its membership in T11.2

Optical ad hoc report

For the first time there were a number of comments on the minutes of the previous meeting. As this is the first time this has happened and the first time that document numbers are available, the amended minutes will be posted to the ftp site

10 km specification
- Document is presently in the final editing stages prior to forwarding to T11.2. Motion was made that this document with appropriate edits be forwarded to T11.2 for further processing.

Colors for SM / MM differentiation
- Focus only on the transceiver (not the cable media, cable connectors, or the cable assemblies).
- There was broad support for the idea that the color blue should be associated with single mode transceiver ports.
- A straw poll supported the colors black or beige should be associated with multimode transceiver ports.
- Discussion indicated that MM transceivers need to be (and presently are) compatible with both M5 and M6 fibers.
- This item will be added to the agenda for the next meeting.

Update on SG connector standardization
- Ron gave the report on the status of the TIA/EIA documents.

- Action item: Group to review the SG spec.pdf located under presentations on Schelto's web page and give comments to Jim.
- Schelto to schedule a line by line review for April WG.

2+ Gb/s

- The discussion started about how to approach the development of the referenced SD3. The issues of the compatibility of a low voltage interface with inter-enclosure and optical interfaces were explored. The low voltage outputs may not be suitable for driving optical interfaces and would require amplifiers to use for external applications.
- Motion passed that the work under this item be assigned to FC0 copper working group.

Issues for joint group discussion

- The group discussed the issues relating to double speed. If the double speed exists it was agreed that this is a significant impact to the physical layer that goes beyond simply achieving the double speed in transceivers.

Double speed:

- The group indicated by an evenly split straw vote that a pure double speed or a mixed double speed single speed was desirable.

- The choice significantly affects the physical layer and the protocol and must be decided to take this technology forward.

Error reporting:

- The T11 FC groups depend on the measurement of link errors to define jitter tolerance in FC ports. T11.2 is not requesting any additional analog port functionality but is recommending that FC devices implement the FC-PH options that enable reporting CRC and other errors that could be caused by the physical layer so that errors can be made visible through in-band schemes.

Retimers/repeaters:

- Reinforce the distinction between repeaters and retimers. FC-PH only accommodates retimers but makes no provision for repeaters.

Several items were not covered due to lack of sufficient meeting time

Ed Grivna moved and Ed Cady that Ham generate a proposed change to the FC-PH wording to remove the ambiguity between the MJS and FC-PH with respect to the use of the word repeater.
Motion passes: 24/0/1

Schelto moved that the low cost SM document 100-SM-LC-L be forwarded to T11 for further processing. Ali Ghiasi seconded.
The motion passes 26/0/0.

T11.2 Copper Interface Work Group Status 2-11-98

1. Had presentations from
    A. Berg Electronics on their Meta-Gig connectors and cabling
        B. Molex on 2 Gbaud+ signaling on DB-9 connectors

2. Presented status on CU-TR

    A. Combined two clauses with two others
    B. Received editors/authors for four clauses
    C. Received input for two clauses
    D. Will generate rev. 1.0 of CU-TR and post to web

3. Discussed issues for 2/4 GBaud signaling

    A. Developed list of 13 major concerns
    B. Requested technical presentations/investigations
       on these issues

MJS ad hoc report

Call for patents:

Dennis Petrich from Wavecrest noted that Wavecrest now is a licensee of the patent for the algorithms used to synthesize jitter on IC chips formerly owned by Gadzoox transferred to Tektronix and now licensed by Wavecrest

MJS-1 issues:

Mike Jenkins showed signals coming into the limiting amp and signals coming out of the limiting amp. He saw nearly 2X the jitter coming into the amplifier compared to that observed coming out. These observations were not consistent with other observations taken by Mike in other nominally identical conditions.

Document Review

Annex E was discussed in terms of the length matching requirements. It was decided that the specific reasons for the length matching requirements would not be documented since the relationship to the induced jitter is not known.

New Definitions: **!! Note: not the Final version. !!**
- **Baud**:   Baud is the smallest nominal time between signal transitions.
- **Unit Interval**: Equivalent to baud - one bit period
- **Baud rate**: The reciprocal of baud (Measured is sec^{-1}).

Motion passed that the rev 3.0 of MJS be created (which consists of rev 2.0 plus listed changes) and be recommended for forwarding to T11.2 for further processing

Listed changes:
- Minor wording changes to annex E relating to length matching requirement and low frequency performance.
- Table B1: change baud to UI
- Show actual frequency example when relating to baud rate e.g. 0.001 f/baud rate = 1MHz for 1Gbaud
- Add definitions for baud, baud rate and unit interval
- Rationalize CJPAT and related issues
- Add wording relating to jitter peaking and CDR bandwidth
- Figure D9 and associated words to be changed to original supplied by Mike Jenkins
- Annex D audit trail to be verified

MJS 2

Dennis Petrich (Wavecrest) made a presentation concerning the execution of the jitter tolerance and jitter test setup in Figure C4 of rev 2.0 of the MJS document.

The acronyms for DJ were discussed. The proposals were:
- DCD   duty cycle distortion
- DDJ   data dependent jitter

- ISI   component of DDJ that is caused by intersymbol interference
- SJ   Sinusoidal
- PJ   periodic
- UDJ   Bounded/uncorrelated

This presentation was intended to show that the TIA technique could be used to calibrate a signal created by the circuit of fig C4. Good correlation was found between the TIA measurements and the programmed features of the signals using the synthesis components in Fig C4.

Jan Wilstrip of Wavecrest presented a technique based on the repeating data pattern and using a TIA instrument to extract the jitter data. This is similar in some ways to that presented by Dave Instone in earlier meetings but Dave used an oscilloscope. Since it requires a repeating signal it is not a candidate for use with functioning FC devices.

Jan's technique used a data pattern based timing reference.

His technique systematically removes the DJ components one at a time until all that is left is a residual jitter. This is possible because of the repeating pattern. This residual jitter calculated this way still contains bounded / uncorrelated DJ components as well as Gaussian components.

The candidate topics for MJS-2 were reviewed. No objection to the content was received

Next meeting: April 20, 1998 Palm Springs

Schelto moved that rev 3.0 of MJS be forwarded to T11 for further processing. Ali Ghiasi seconded.
Motion passes 25/0/16.

Error reporting tutorial - Snively

Bob Snively gave a tutorial on the present architecture available for getting reports and visibility to errors occurring in FC links.

FC-PH 21.4.11 and FC-PH 29.8 has details on the LESB mechanism where several kinds of error are defined. The LESB command is not presently defined very precisely. Also the LESB counters cannot be reset – one must do running delta counts.

The items available for reporting are listed in FC-PH.

FC-AL defines requirements for the correction of invalid transmission words when detected. Therefore invalid transmission words will be corrected. Invalid transmission word are usually caused by 8b10b violations.

Data pattern - Tom Lindsay

Tom was interested in defining patterns that stress EMI parameters. This work will be directed at the copper working group.

Plenary week, April 20-26, 1997 Palm Springs

The same meeting map will be requested for Palm Springs: Monday 8-5 for MJS, optical working group Tuesday 8 to 5, copper 8 to 12, Plenary 1 to 8.

Motions from T11.2 to T11:

1. **That the low cost SM document 100-SM-LC-L be forwarded to T11 for further processing.**

2. **That rev 3.0 of MJS be forwarded to T11 for further processing.**

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